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THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH

Essays on COVID-19 Research

Edited by
Zoe Boutsoli, Victoria Bigelow &
Olga Gkounta

Athens
2022

Essays on COVID-19 Research

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President's Prologue

Gregory T. Papanikos

The Athens Institute for Education and Research (ATINER) is a world association of academics and researchers based in Athens. Its mission is “to become a forum where Academics and Researchers from all over the world can convene in Athens in small groups like in ancient Athenian symposiums, exchange ideas on their research and discuss future developments in their disciplines, as well as engage with professionals from other fields” (<https://www.atiner.gr/mission>).

Since its establishment in 1995, ATINER has organized many such academic events with the participation of thousands of academics and researchers attending from almost 150 different countries. Responding to demands from many of our members and friends, ATINER endeavored into publishing proceedings based on papers presented at the various academic events organized by ATINER. More than 200 books have been published (<https://www.atiner.gr/books-all>) on various themes.

In 2015, ATINER launched a series of quarterly academic journals covering a number of disciplines. Currently (2022) the list includes 16 free-access academic journals without any fee charged either on authors or readers (<https://www.athensjournals.gr/>).

This year ATINER has decided on a new initiative in a more systematic way to publish books based on previously published papers in ATINER's journals and co-edited by academic friends and researchers affiliated with ATINER. The aim is to improve the communication of research to all academics based on common themes. All ATINER's journals are within the spectrum of a general discipline - non-thematic, e.g., *The Athens Journal of Social Sciences*. This makes it difficult for a scholar to follow publications in her/his own specific area of research.

Thus, this book entitled, *Essays on COVID-19 Research*, and edited by Zoe Boutsoli, Victoria Bigelow & Olga Gkounta, aims at filling this gap by presenting to all those who are doing research on COVID-19 to find in one handy and freely available in its electronic format book, selected papers related to this issue. On this occasion I would like to extend my thanks to ATINER's Vice President of Publications, Dr Zoe Boutsoli, and to the two ATINER's researchers, Victoria Bigelow and Olga Gkounta, for their efficient work in bringing this volume together.

Lastly but not least, I should mention a new type of publication which was also launched this year. ATINER different publications included a book of abstracts presented at a specific conference without any further elaboration. Starting with the first conference this year, the one on Humanities and Arts, its abstract book has been published in a different way and edited in a book format with an introductory chapter; see here: <https://bit.ly/3ME4FV3>. The introductory chapter of all abstract books published this way henceforth will be published in one of the journals which sponsors the particular academic event.

Essays on COVID-19 Research

I do hope that both these two initiatives will serve the mission of ATINER as mentioned above by making easier for the academics of the entire world to share their research findings and thoughts with their colleagues around the world. Since this process is ongoing, we do invite other academics to contribute to this scientific endeavor by submitting comments or book reviews which can be published in one of ATINER's journals or elsewhere.

Essays on COVID-19 Research: An Introduction

Zoe Boutsoli, Victoria Bigelow, & Olga Gkounta

This chapter is an introduction to this book publication “Essays on COVID-19 Research” and presents a survey of the thirty-one selected studies for this book that have been published in various ATINER academic journals since the beginning of the COVID-19 pandemic. All of these studies have undergone a double-blind peer review process and have been accepted for publication. The aim of this chapter is to summarize the main research findings of these studies and highlight their major conclusions. These studies cover research related to COVID-19 from a variety of research fields that include Health; Mass Media and Communication; Sociology; Business and Economics; Tourism; Education; and Law.

Keywords: *COVID-19, pandemic, deaths, lockdowns, vaccinations, well-being, recovery plan, distance education*

Introduction

COVID-19 has entered its third year and the effects have been devastating. The obvious one is the loss of lives which by now account for millions of people worldwide. The world academic community reacted quickly, resulting in a mass of publications on the various aspects of the pandemic, including the most important aspect of which is the medical and health effects and the development of vaccines to fight the virus. Never before in human history has such a global mobilization of researchers produced such spectacular results in such a short period of time. Along with the research on medicine and health, numerous studies were published which deal with other aspects of the pandemic such as the economic and social repercussions both in the short-run and in the long-run.

The plethora of studies on COVID-19 makes a comprehensive survey almost impossible. Instead, this chapter provides a selective review of a sample of studies which research various aspects of COVID-19. The selection criterion is a very simple one: this chapter surveys only studies which have been published in the various journals published by the *Athens Institute for Education and Research* (ATINER). The cut-off date was the end of 2021. Thus, studies published or submitted and accepted for publication by the end of 2021 are included in this survey. In total, 31 studies are included which are organized into seven themes.

The following sections of the survey correspond to each of the separate themes. There is also a final section which provides the main conclusion of the chapter and speculates about the direction of future research on COVID-19.

The Health Aspect of COVID-19

This section consists of five studies—original surveys coming from four Mediterranean countries (Malta, Turkey, Greece, and Italy) and Pakistan, a country

in Southeast Asia. All researchers examined the effects of the COVID-19 pandemic on various health issues in different healthcare environments around the world. In particular, Galea et al. (2022) focus on the impacts of the COVID-19 pandemic on the well-being of the elderly people (65+) in Malta. They collected anonymous data from 500 participants (18–85 years old) by the Richmond Foundation Malta over an eleven-month period (April 2020 – March 2021) and concentrated on the 65–85 age category. Their results revealed that the stress levels and worries (about their own and their families' well-being) of the elderly increased with the progression of the pandemic. Contact with family and/or friends through internet platforms declined in time, feelings of happiness and hopefulness steadily increased coupled by a decrease of fear and depression over time. However, the feeling of loneliness increased more with age. Galea et al. (2022) highlight the important role that religion played for the elderly in Malta and the comfort found in prayer during the pandemic time.

Following, Menekli et al. (2021) produced an observational study which analysed the relationship between the perceived stress and gastrointestinal (GI) symptoms during the COVID-19 outbreak in intensive care unit (ICU) nurses, who are on the frontlines in the fight against the pandemic. Menekli et al. (2021) tested the following three research questions: *What are the GI symptoms that ICU nurses experience during the COVID-19 pandemic? Is the perceived stress in ICU nurses associated with GI symptoms during the COVID-19 pandemic? and What are the factors associated with GI symptoms that occur in ICU nurses during the COVID-19 pandemic?*

They used a sample of 170 nurses working at the ICUs of the Malatya Research and Training Hospital in eastern Turkey. They collected data through the face-to-face interview method between October 2020 and January 2021. As far as the GI symptoms that ICU nurses experience during the COVID-19 pandemic, they mostly suffered from heartburn, diarrhoea/constipation, abdominal distention, postprandial bloating, dysphagia, abdominal pain and fewer than 3 weekly defecations, hard or lumpy defecation, early feeling of satiety, nausea, more than 3 defecations per day, a feeling of urgent need to defecate, profuse or watery defecation, vomiting, feeling of anal obstruction, and faecal incontinence problems often or very often. Concerning the 2nd research question, Menekli et al. (2021) found a statistically significant relationship between GI symptoms and perceived stress scores ($p > 0.05$). From the multiple linear regression analysis performed it was found that women nurses, those with bad perceived health status and a fast-food diet, nurses who had had a previous COVID-19 infection status, and those who work at a high-risk ICU in terms of COVID-19 were most likely to suffer from gastrointestinal symptoms during the COVID-19 outbreak. Researchers have concluded that the presence of the COVID-19 pandemic has deteriorated the perceived stress of ICU nurses and has increased the number of gastrointestinal symptoms due to exhausting shifts and stressful working conditions.

Papanikos (2021a) has considered the effects of lockdowns, vaccinations and weather temperatures on the number of deaths due to COVID-19. Regarding the first independent variable, and for the purposes of this study, the basic criterion to be considered a time period as “lockdown” is whether primary and secondary

schools were open or not. Based on this assumption, during the period of the current pandemic, the Greek government had decided to close down the economy three times (from March 11, 2020 to May 31, 2020; from November 9, 2020 to January 31, 2021; and from March 16, 2021 to May 17, 2021). The three lockdowns sum up to 229 days. The research question was whether these three lockdowns had any positive effect in decreasing the number of deaths. From his analysis, Papanikos (2021a) found that the first lockdown had a drastic effect of keeping the daily number of deaths very low indeed. After a summer period where the number of deaths continued to be low, even though the strict lockdown measures were lifted, during the fall 2020, the total number of daily deaths was starting to rise again, resulting in the second lockdown by the Greek government. The de-escalation of the total number of deaths only happened after the Christmas holidays, where the daily death toll of COVID-19 decreased, but had never returned to its earlier period of the first lockdown. The third lockdown, lasting from 16 of March 2021 to 17 May 2021 (63 days in total) mostly affected the total number of deaths due to COVID-19. Two basic differences are observed between the second and the last lockdown. Firstly, the average, the standard deviation and the maximum values of the number of deaths were higher in the third lockdown compared to the same numbers of the second lockdown, and secondly, it took a longer time for the effects of the third lockdown to show up. The second independent variable examined by Professor Papanikos (2021a) was the role of vaccination on the behavior of the total number of deaths due to COVID-19. Based on a well-organized vaccination program, the Greek government achieved to protect about 4.3 million people from Sars-CoV-2 through vaccine by June 14, 2021. The research question regarding the vaccination independent variable was whether the large number of vaccinated people has negatively affected the total number of deaths due to COVID-19. From his correlation analysis, Papanikos (2021a) found that a non-linear effect of vaccinations exists—a positive in the beginning and a strong negative thereafter—providing supportive evidence that vaccinations do work after a few weeks have passed. Thus, the second research hypothesis of negative correlation between vaccinations and daily deaths due to COVID-19 seems to not be refuted. Lastly, Papanikos (2021a) found that the daily number of deaths and the average daily weather temperatures have a negative relationship, which means that when temperatures increase, the number of deaths from COVID-19 decreases. At 28.5°C, the number of deaths was found to be equal to zero. Thus, one may conclude that weather temperatures did affect the daily number of deaths and an explanation is that warm weather allows for outdoor activities which reduce the spread of the disease.

Another health issue with social consequences during the pandemic period was examined by Parodi et al. (2021). They assessed the impact of the COVID-19 pandemic on immunization activities using a questionnaire to explore reasons for a decrease in vaccinations in Italy. The survey was conducted from 28 May to 9 July 2020 using a questionnaire to understand the impact of COVID-19 on immunization activities and measures implemented at local level, in order to identify best practices to share at national level. A total of 97 questionnaires were collected from Local Health Agencies (LHAs), belonging to 16 Regional Health Services

(response rate 76.1%). Parodi et al. (2021) found that almost all LHAs (94/97= 96.9%) reduced their immunization activities during the COVID-19 emergency, compared to the same period of the previous year. About one-fourth (28%) of immunization centres suspended their activities, while more than 33% of health workers (i.e., physicians, nurses, and administrative staff) were shifted from the immunization centres to the COVID-19 health services. Lastly, almost 5.5% of staff working in the immunization centres was infected by SARS-CoV-2. As far as the most affected ages are concerned, children above one year of age until adolescence are the most affected by disruption of immunization services (n=64/94; 68%). Parodi et al. (2021) have found that at the national level, anti-HPV was mentioned as the most affected, followed by Herpes Zoster, DTPa and meningococcal B. The most important organizational and public health measures to normalize the existing situation according to the researchers were: immunization only under appointment, giving priority to some immunization/ subjects and extension of the hours of work to avoid overcrowding, telephone calls to families, developing a list of children who have missed their vaccine doses, and preparing a targeted action plan to ensure rapid catch up of children who are not up-to-date with their vaccinations.

The last study surveyed in this part is a study which used data from Pakistan. Shah et al. (2022) determined the temporal variations and mechanism of injury of supracondylar humerus fractures presented to the Accident and Emergency Department (A&E) at Lady Reading Hospital in Peshawar, Pakistan during the COVID-19 pandemic lockdown. Primary data were collected from 18th March 2020 (—Strict Lockdown) to 18th June 2020 when relaxation in the lockdown (—Smart Lockdown) was allowed and partial elective hospital services of the hospital were resumed. The sample size for the study was 160 children of both genders and aged up to 12 years with supracondylar fractures who visited the A&E department within 3 days after getting the fracture. There were 121 boys (75.6%) and 39 girls (24.3%), while the mean age was 5.3 ± 1.3 years (a range from 3 to 9 years). Most children (n=134; 83.7%) had a left supracondylar fracture. The majority of little patients (n=128; 80%) arrived in the hospital within 24 hours of sustaining the fracture. The main cause of fractures were indoor falls from height (n=121; 75.6%), including falls from furniture, stairs, trees or bicycles. From a days and time analysis of the fracture, data results show that the two days of the week that children sustained fractures more frequently than other weekdays were Mondays (n=38; 23.7%) and Fridays (n=31; 19.3%), mostly in evening times (n=105; 65.6%). For limitation of the negative effects of the COVID-19 pandemic on paediatric supracondylar fractures, Shah et al. (2022) support that preventative strategies should focus more on adult supervision, prevention of falls from furniture and provision of softer landing surfaces, such as sand to lessen the impact of injury. From the hospital perspective, researchers suggest that the optimum care of these fractures should be accompanied by dedicated night operation theatres with trained medical and nursing staff.

The Mass Media and Communication Aspect of COVID-19

What differentiates the current pandemic from all previous ones is the tremendous effect of mass media and communication. This is also reflected in the number of research papers published on the issue. In this section, five studies are reviewed. Of great interest are the attempts by governments and other entities to campaign the promotion of vaccinations. Two studies use Italy as a case study and another study looks at the role of social media in Turkey. The last two studies of this section emanate from researchers with different approaches to the pandemic problem; one study uses the Canadian context –an advanced country, and the other Nigeria, a lower-middle income economy.

Crescentini and Padricelli (2022), from Italy, aim to set an explorative investigation about the social communication practices during the first three months of the vaccine campaign addressed on social media by Italy's most established virologists. Their aim was to answer the research question about how Italian scientists communicate and approach the larger public on social media. In order to select the scientists who are involved in the exploration, the researchers referred to a recent study by Reputation Science, a research center specialized in crisis management consulting, particularly in the scientific context. They use Reputation Science methodology on scientist's classification concerning their visibility on mass and social media from February 1st to November 20th, 2020 and selected five virologists according to their social media presence. As context units, the researchers selected two specific social media platforms: Facebook and Twitter. For data collection, procedure on Twitter and Facebook and tools such as the scraping procedure via Python syntax and the CrowdTangle were used respectively. The collected data were divided into 4 main domains (General information, Cross information, Engagement and Audiovisual, and Text information) and then organized in a Cases-per-Variable matrix composed of 1,306 observations per 13 variables. The content has been classified according to the platform uploading (Twitter and Facebook), and so too its classification unit (audiovisual or textual) duly specified in the post-type variable by which come possible to recognize the original or repost content. According to the topic modelling analysis, the emerged topics are the following: virus mutation; effectiveness of vaccine; AstraZeneca case; relevance of data; preparation of vaccine campaign; scientific network; vaccine's supply; response capabilities; scientist reputation; and media presence. From the Multiple Correspondence Analysis (MCA) results for the topics "the withdrawal of AstraZeneca batches" and "Vaccine effectiveness" Facebook appears as the most-used platform by the observed scientists, while for the quieter discussion the elected platform is Twitter. For topics "vaccine campaign preparation", "scientific network", "vaccine supplies", and "response capabilities" most scientists prefer a social media exposition on Twitter, compared to Facebook, which is preferred only by Antonella Viola, who is the only scientist open to controversial discussion. Her position on vaccine plans is clear by how she benefits from high reactivity from her followers instead of Ilaria Capua and Fabrizio Pregliasco, more oriented toward quieter exposition about the vaccine argumentation, whose posts are in fact characterized by low likes,

comments and shares. Moreover, Roberto Burioni and Alberto Zangrillo's communication is characterized by a medium degree of reactivity from their followers. Lastly, from the Lexical Correspondence Analysis it becomes clear that there is a relevant mass media exposition of the selected scientists. They disseminate their statements via social media, originally conceived for mass media, finding on the web a new resonance chamber where the spread of the research outcomes is reluctant to react to Twitter's general public. Where the controversial discussion crosses the timespan observed, a dialogic strategy is applied only by Antonella Viola on topics such as the vaccines and its effectiveness due to the virus mutation. In conclusion, the virologist Dr. Antonella Viola looks to be the only scientist truly in accordance with a pure disintermediating process featured by content thought specifically for the social media and the digital languages that promotes a direct contact between sender and receiver, making the figures outdated as intermediate in the communication processes.

De Falco et al. (2021) applied a mass media technique, the Content Analysis, to the recent COVID-19 outbreak and its development of the perception of the Italian population on a specific digital social platform, Twitter. Given the emergency generated by the spread of COVID-19, with this study, the researchers wanted to focus on social data in order to investigate the online perception of one of the populations most seriously affected by this catastrophe: the Italians. The data collection involved all the tweets about COVID-19 in Italian. It covered the period from March 5-15, when several important decisions relating to COVID-19 mitigation were made (DPCM 2020). Given the extension of the corpus and the limits relating to the API's Twitter (max 18,000 tweets per day), several daily extractions were carried out. The extraction keys were based on the following hashtags, i.e., #coronavirusitalia, #coronavirus, #iorestoacasa, #fermiamoloinsieme, #italiazonaprotetta. Although the final corpus consisted of about two million tweets (including retweets), De Falco et al. (2021), in order to facilitate mixed design, decided to work on a more limited sample of 10,000 tweets (without the retweets), randomly extracted respecting the hashtag proportions related to: Tweet daily number and Hashtag groups. The researchers have found that from the first day of extraction until March 11 there was a progressive increase in "COVID" tweets, with the most active days were those from March 8 to March 11. The high number of tweets is plausibly connected to the implementation of important lockdown orders in Italy—first in the North and then throughout the rest of the country. March 11 (after Italy's lockdown) was in fact the day with the most tweets extracted (just over 13% of the entire body). For reducing the space of mining contained in large sets of textual data as well as the dataset used for their analysis, De Falco et al. (2021) have implemented a combination of a Lexical Correspondence Analysis (LCA) and a Cluster Analysis (CA). The first result obtained with the application of the LCA is the delineation of two main synthetic dimensions of mining called factors. These factors were crossed and used to build a new space of mining generated by this crossing. On the factorial plane obtained, there was also the projection of the cluster that the researchers obtained through the application of a further statistical analysis on this dataset, the CA. The first factor is related to the opposition between the private and public sphere used as direction of the

expressed perception in the analysed discourses, while the second dimension is related to the opposition among the focus of the constructed discourses among the tweets. From the analysis, five groups were extracted from the cluster and each one is characterized by a specific perception of the pandemic that derives from the collectively constructed narration by Twitter users in the first ten days of national lockdown. The first group is located near the centre of the plane and the name that can be attributed is that of *perception in tension* between the most intimate and individual dimension and openness to collective experience. The second group is at the crossroads between a dimension tending to collective-public openness and a propensity towards emphasizing the discourse, focused on the health emergency and defined as holistic perception. The third group explicitly refers to the need for support to the healthcare system with words like *support, hospital, and medical staff*, resulting in a *rationalist and consciously alarmist perception*. The fourth group is the one in which a strongly self-centred perception prevails, and the researchers find tweets that lead back to the effects on the private sphere of the pandemic, such as *Netflix, aperitif, boring, new habits, new way of working from home*, etc., mostly tweeted in the evening and at night. The fifth cluster mainly focuses on more general medical emergency issues and technical medical issues, mostly tweeted in the morning, resulting in a *pro-active soothing perception in risk management*.

In the third study of this section, Mengu et al. (2021) analyse the messages sent by the Ministry of Health during the pandemic in Turkey via social media, particularly on Twitter, in order to find out to which extent these messages encompass the features of value-based communication. By applying both discourse analysis and a descriptive research model, Mengu et al. (2021) have used a total of 505 Tweets posted after January 25, 2020, and had a reference to Coronavirus. Specifically for the discourse analysis, 100 tweets that have received the most interaction, in terms of count of retweets and count of likes were used, but for the other descriptive analyses all 505 tweets were utilized in a cluster analysis. After the Value-Based Communication coding process was carried out, the researchers extracted 782 codings in total. These codings included three main categories of Value-Based Communication and their sub-categories, such as “trust”, “person-oriented health actions” and “governance”. The “trust” category has 7 sub-categories, “person-oriented health actions” has 10, and “governance” has 4 sub-categories. In the codings made according to the expressions on Twitter, it was determined that there were 266 codes in the “trust” category, 337 codes in the “person-oriented health actions” category, and 179 codes in the “governance” category. In this value-based coding, it has been determined that expressions about “person-oriented health actions” come to the fore with 43.1%, expressions about “trust” were at 34.0%, and finally the “governance” category at 22.9%. Based on both network diagram analysis and cluster analysis, Mengu et al. (2021) have found that communication activities performed during the pandemic were carried out in accordance with communicative leadership. They have concluded that messages provided by the Minister of Health via Twitter were in line with the main criteria and sub-criteria of value-based communication and constitutes collaboration.

Another major issue in the media industry is addressed by Fitzpatrick (2022) who researches the phenomenon of news avoidance in the epoch of the COVID-19 pandemic and tries to analyze whether it is something temporary or whether it came to stay, like the SARS-CoV-2 virus one could say. From his current research, it is obvious that people (news consumers) are exhausted by the plethora of news offered by the different media outlets: newspapers, television, radio, and social media; they feel overwhelmed by the massive variety of news coming to them, most of which are grim, leading, in many cases, to a deterioration of their mental health status. Considering this, many consumers choose to avoid the news media. Adding to this avoidance, Fitzpatrick (2022) also mentions the growing distrust in mainstream media and skepticism surrounding journalism that became much more vivid during the pandemic years with the growth of anti-vaccination and conspiracy voices that question the validity and accuracy of the COVID-19 facts distributed by news entities. Now, it is high time for journalists who have proved their relevance and tried to bring back the consumer-avoiders by rewinning their trust by increasing the transparency of news coverage.

Finally, Osisanwo (2022) discusses on the context and representation of COVID-19 in four selected newspapers (*New York Times*, *The Guardian*, *China Daily* and *The Punch*) across the globe. He argues that these newspapers initially set the groundwork for the negative portrayal of the SARS-CoV-2 virus and the potential damage to all human activities, giving, in this way, a motive for all to act unilaterally despite the silencing in the beginning of the epidemic.

The Sociological Aspect of COVID-19

This section includes social issues that emerged from COVID-19 which is particularly broad, not only as far as it concerns the areas that it stems from (from Data Analytics to Demographics, and the Building Environment), but in geographical coverage as well, examining realities in Croatia, Spain, and the European Union in general, Kenya, and Peru.

Diving into it, we find five papers. Firstly, Bäckman (2021) examines the COVID-19 pandemic particularly through the lens of social policies and economics and presents an overall picture of the pandemic reality with a focus on the strategies and goals to be adopted to combat the spread of the virus. Papanikos (2020b) concentrates also on the important positive role of social policy in the combat of COVID-19, and underlines that the European countries should act unilaterally through a cooperated common policy in which a better outcome could be achieved. He further researches whether population sizes and economies have a relation to the observed variations in COVID-19 and the answer is yes; he proves that they do matter through simple stepwise descriptive statistical analyses. In which way? The higher the population of a European country, the higher the death rate, and the richer the country, the higher the deaths per capita. But, the higher the social spending as a share of Gross Domestic Product (GDP), the lower the ratio of deaths to population.

Following this, Jurić's (2022) study adds to current research in the field as he developed a method for predicting new COVID-19 cases that can be also applied in scouting for mental health problems and domestic violence cases during the pandemic, as well as predicting future birth rates in Croatia. We know that an early monitoring of a rise of COVID-19 cases in a particular area is crucial. Specifically, he used Google Trends analytical tool to monitor the digital traces of particular language searches (such as "PCR + test", "coronavirus + testing", and more) and he found out that the increase in such search queries is correlated with the increase in the number of new cases (as it was cross-checked with official data).

Polo Martín (2021) addresses the COVID-19 issue in terms of urban space and cartography. She highlights that nowadays cities face a problem of congestion, much like they did during the 19th century, when industrialization brought large crowds to the cities, making them overpopulated and without proper safety and sanitation infrastructure that led to the spread of diseases. She points out that changes in urban structure of cities happen slowly and cartography helps as it depicts these changes: digital maps show the transformation of the Spanish cities during the pandemic where one can see the expansion of cycling lanes, the development of pedestrian and green spaces, and more. Polo Martín (2021) argues that experts should opt for the ideal model city in which an autonomous city is more relevant than a "smart" city. Creating autonomous entities within the city that can respond and act independently and could be the key to addressing the needs of a globalized and overpopulated world.

In the city of Nairobi, Kenya, Okaka and Omondi (2021) investigate the perceptions and knowledge about COVID-19 of the elderly (above 60) living in informal settlements. They conducted a cross-sectional survey of 150 people (60+) from two selected squatter settlements in August 2020. Looking into the results, it is seen that only about 60% were aware that they are at risk of contracting COVID-19. For the rest of the sample, the belief that they were not at risk prevailed, religiousness was the rationale. Okaka and Omondi (2021) point out that by raising awareness of COVID-19 and by adopting health education strategies in this vulnerable category of people would help in the decrease of the impacts of SARS-CoV 2 virus.

Last but not least in this section, Lust (2021) explores the spread of the SARS-CoV 2 virus in Peru. He considers the neoliberal development model responsible for the inability of the government to implement proper (relevant to the country's social and economic structure) measures that might have led to the constraint of the virus. He further argues that the expansion of COVID-19 in Peru is mostly the result of the overall labor precariousness and informality.

The Business and Economics Aspect of COVID-19

The new virus and the pandemic inevitably affected the business sector and the economy in a negative way. This section presents five studies that deal with such issues in the European Union, the USA, South Africa, and Nigeria.

In the first study of this section, Papanikos (2021c) examines the July 2020 European Union's recovery plan from COVID-19 with emphasis on two of its hypotheses: a) *the health situation is improving*, and b) *the pandemic increases economic divergence between member countries*, hypotheses that he then rejects through his research, reaching the conclusion that the economic impact cannot be entirely determined if the pandemic is not permanently over and as a consequence the enormous spending of 750 billion euro should not be based on stylized economic and epidemiological facts.

Then, Reid (forthcoming) analyses the economic effects of the COVID-19 lockdowns in the USA between 15 March 2020 and 8 May 2021, using a cost-benefit analysis framework; specifically, a) by a traditional cost-benefit analysis that supposes that life value is constant regardless of the age, and b) by a preferred analysis that adjusts the number of deaths, and values the economic cost of the deaths based on the age of the deceased. Upon the completion of his research, he reached the conclusion that the economic benefits of the lockdowns fell behind the economic cost.

Moving to the continent of Africa, Uwah et al. (2022) investigate how prepared are the financial service providers in Nigeria's post-COVID reality using financial inclusion as a "new normal" for their clients' financial needs. The data were collected from 102 respondents of Nigerian accounting and financial companies. The results of the research showed a significant relationship between the socio-economic development structure and the acceptance of financial inclusion as a "new normal" in financial transactions. Uwah et al. (2022) suggest that in a struggling and developing Nigeria, financial companies and providers should move beyond the traditional services to a more financial technology-friendly environment that can act as a driver for financial inclusion. In a similar context and in the same country, Adejare et al. (forthcoming) draw further upon Nigeria's affected business sector and in particular the Fast Moving Consumer Goods (FMCG) sector by the COVID-19 pandemic. They found that there is a direct impact of the pandemic to businesses' survival, productivity, and technology adoption; unemployment; and customer retention.

Lastly, Struwig and Watson (forthcoming) in South Africa offer a critical analysis of the working capital management research during the worldwide economic crisis (2008); during the pandemic; during extreme change; post-pandemic; and during the new economic order. They point out that during the COVID-19 pandemic, and in general during all sort of crises, businesses need to have to the point working capital management practises more than ever so that they can survive. Struwig and Watson also provide proposals upon maximization of the working capital efficiency.

The Tourism Aspect of COVID-19

The tourism industry is one of the most hit industries by the COVID-19 crisis. What reigns in this industry during this period are the high levels of uncertainty

and the many challenges that have popped up to be faced by the businesses and personnel.

Papanikos (2020a) researches the economic impact of the COVID-19 pandemic on Greek tourism with regard to international tourism receipts. He argues that not even the impact of the Greek economic recession was comparable to the huge negative impact of COVID-19 on the economy of Greece. Just in 2020 alone, Papanikos (2020a) expects tourism receipts reductions to have an impact between 9 and 14 percent of GDP. He further states that government intervention to help is only a temporary solution. Building on the government's actions to help the sector, Jones (2022) in his study about how to cope with and overcome the devastating effects of the pandemic on the UK's tourism industry, reviews the UK government's tourism recovery plan (published in June 2021) in detail, argues on its proposed measures and finally provides some critical reflections and concluding thoughts.

What comes next is Jones and Comfort's (2020) study that explores the relationship between the tourism sector and the sustainable development in such a challenging time as the COVID-19 pandemic. Their study offers a compilation of arguments and opinions on a number of authorities on sustainability in the tourism industry, and then they further provide an analysis of them.

Finally concluding this section, Gukiina and Lamunu (2021) in Uganda examine what kind of relationship exists among employee optimism, status competitiveness, interpersonal adaptability and employee altruism during the pandemic. They used a sample of 303 managers and employees from 70 randomly selected hotels, and showed that there is a significant and positive relationship between: a) employee optimism, interpersonal adaptability and altruism, b) status competitiveness, interpersonal adaptability and employee altruism, c) status competitiveness, employee altruism and employee optimism, and d) interpersonal adaptability, employee optimism and status competitiveness.

The Education Aspect of COVID-19

The first study of this section written by Papanikos handles the COVID-19 pandemic from a historical perspective. Papanikos (2021b) analyses whether people learn from past mistakes, and specifically he explores if the writing of Thucydides' history with regard to how the ancient Athenians acted during the epidemic of 430 BCE, which brought wisdom in the way that the current world is handing the pandemic. He argues that apart from a few tiny differences and the evident progress seen across the years in technology, people and societies today react pretty much the same as in the past, with the main problems, as well as the socio-political issues remaining the same, vindicating Thucydides only in his view that human nature does not change.

Researching further on how COVID-19 influenced education, one can see that there was a rapid and forced shift from the traditional face-to-face class to the online one in all educational levels globally. Ismaili and Ibrahim (2021) provide a real-time, two level –learning and reaction– (proposed by Daniel Kirkpatrick)

evaluation of the distance learning model of Moulay Ismail University in Morocco. They specifically explore the students' views regarding the pros and cons of distance education based on: a) accessibility, b) autonomy, c) retention, and d) psychological impact. They found out that a platform with simple to understand content; proper equipment and a good internet connection; and better communication and contact with professors are required in order for the distance learning model to be considered successful.

In this direction as well, Jereb et al. (forthcoming) explore and compare the studying habits of students before and after the pandemic using a sample of 272 students from the University of Maribor in Slovenia. Their results reveal that there is a decrease in motivation to study coupled with lowering learning goals, and students find it more difficult to focus on learning. Study spaces and times also differentiated. In addition, Jereb et al.'s study found out that distance learning has taken a toll on students' well-being, as they miss getting together and mingling with classmates and the on-site interaction with their teachers. But, they also underline the finding that distance learning was perceived by some students as something that they wish to keep because of the great level of flexibility it provides.

In the fourth and final study of this section, Güvercin et al. (forthcoming) investigate through a qualitative research study how teacher-parents view the distant education process in Turkey. They highlight that distance education is regarded as a supportive means rather than a replacement for face-to-face education and is perceived as something valuable in order for students to retain contact with the educational process. However, phenomena such as internet connection problems; low attendance and unavailability to attend online classes due to the lack of sufficient internet packages or technical problems related to the applications; and the decrease in motivation to participate over time, hinder the d-learning process.

The Law Aspect of COVID-19

The section of Law contains two studies in Romania — one on contractual unpredictability and the other on the insolvency of the natural person during the COVID-19 pandemic.

In the first study, Patraus and Ofrim (2021) argue that, in a dynamic social and economic context, it is necessary to clear up the relationship between the binding force of contracts and the possibility of invoking unpredictability in situations where certain changes affecting the contractual balance occur in the performance of obligations. They explore whether this institution finds its applicability in the effects on contractual relations, generated by the COVID-19 pandemic and the measures taken by public authorities to mitigate the human health impacts of the pandemic.

In the second study, Iancu (2021) states that among the actions taken to alleviate the socio-economic impacts of the pandemic on citizens, one should consider the encouragement to access the natural person insolvency procedure, by means of which the debtors acting in good faith may be exonerated from part of their debts. However, her study shows that this procedure is not accessed by the

over-indebted natural persons, as they are discouraged by the ambiguous legislation on the issue and the huge number of required documents.

Conclusions

COVID-19 brought a new global reality. It brought stress and fear to human minds, especially those of the elderly, made people reconsider human values and put governments in the place of rating priorities (public health, economy, etc.); someone cynical could say that many of them had to “put a value on human life” and proceed accordingly. However, most importantly, it gave the opportunity for the academic community to prove its worth now more than ever by trying to offer solutions to this “multifaceted issue”/“burden”, namely COVID-19, and to provide its valuable help in mitigating its impacts.

It can be seen that the dimensions that this issue covers are so wide, as it affects many life aspects in several arenas. We hope the readers of this collection of studies that cover a wide range of themes will find it stimulating and find insightful reading, not only those of whom are interested in a particular theme addressed, but also to acquaint themselves with other current issues. Finally we wish that after reading this book, you will be inspired to research in your own fields.

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Topics on Health

Psychosocial Impact of COVID-19 on Malta's Elderly

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A global pandemic raises concerns among each human being. However, this is a more pressing reality among vulnerable groups, such as the elderly. It is the scope of this study to investigate the potential psycho-social risks that COVID-19 presents to the elderly in Malta, with a particular focus on their holistic mental health status. Public data, gathered and published by Richmond Foundation Malta, a local NGO, was analyzed during an eleven-month period (2020/2021) during eight different time-points. Two findings were highlighted: first, the roll out of vaccines is still not a room for complacency. This pandemic experience has been, and still is, a learning experience especially to authorities on how to respond to the needs of society, particularly the vulnerable groups. Secondly, results show that generally, a healthy life-style was maintained among most elderly in this study. However, virtual contact with family and friends declined over time, virtual religious programs were maintained, while social isolation increased. This study addressed the importance of attending to the holistic wellness of the elderly during critical times like the pandemic, be they the physical, social, emotional, and religious realities of this population. Furthermore, closing the digital divide was found as a truly relevant realm that calls for more serious considerations. Hopefully, this assists the elderly both in self-care and their concerns about other-care as well. A number of practical recommendations were presented.

Keywords: *COVID-19, elderly, older adults, psychosocial impact, well-being, mental health*

Introduction

The COVID-19 pandemic has drastically altered most people's lifestyle, globally. It has been described as "a portal" (Roy 2020), with significant consequences that have touched most realms of human life: emotional (Montemurro 2020); psycho-social balance of people (Brooks et al. 2020); psychological distress of whole countries (Qiu et al. 2020) employment and the world economy (Gangopadhyaya and Garrett 2020); while risking millions of jobs (Riley 2020). The emergence of vaccines has undoubtedly been great news worldwide that raised hopes that the pandemic's reach will eventually be contained. However, this must still be noted with caution, because the reality of COVID-19 out there remains hindered by many factors, from still to be discovered mutations, to the fact that many populations have grown tired of the safety protocols that had to be implemented (Mukhtar 2020). There are still too many unknowns about this pandemic that life may never be quite the same.

MH services had to be adjusted to the ever-changing and evolving situation, particularly with regards to older adults who had to be isolated and/or quarantined (Yang et al. 2020). A number of consequences were related to this reality

(Armitage and Nellums 2020), with higher degrees of mental health problems including suicide mortality (Reger et al. 2020).

As Van Jaarsveld (2020) clearly found, the effects of the pandemic among the elderly populations is a true case for closing the digital divide, particularly in view of self-isolation. This may entail the redesigning of websites for older adults (Patsoule and Koutsabasis 2014), in order to target this vulnerable population with a familiar and easy to use technology (Leonardi et al. 2008).

Hollander and Carr (2020) have even suggested new and challenging ways to push forward telemedicine in critical times such as the present pandemic. This may endorse a more advanced virtual health care where help and assistance are given to elderly patients in their own homes, rather than the traditional way, whereby individuals were expected to seek help themselves (Webster 2020). Despite the fact that this adjustment may face resistance by some quarters, as each change normally does, it is high time that national strategies are put in place to help alter older people's attitudes and perceptions, in view of possible pandemics that may rise in the future (Mitzner et al. 2010).

Figure 1. Daily New Confirmed COVID-19 Cases

(7-day rolling average. Due to limited testing, the number of confirmed cases is lower than the true number of infections.)

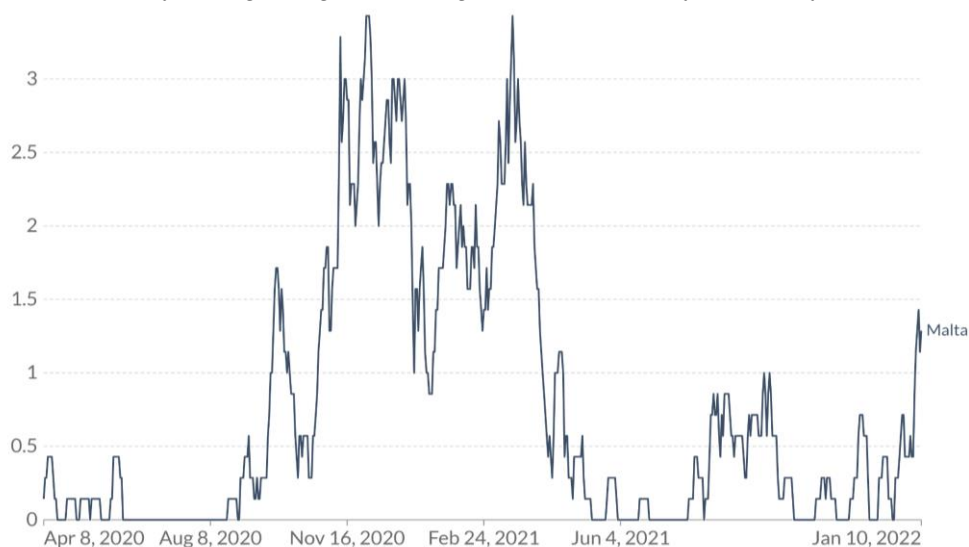


Source: Johns Hopkins University CSSE COVID-19 Data.

Figure 2 shows the daily confirmed COVID-19 deaths in Malta to date. According to the WHO Weekly Epidemiological Update (11th January 2022), there have been more than 305 million cases, over 5.4 million deaths, and with more than 9 trillion vaccines given, globally. In Malta, there have been over 60 thousand cases (Figure 1), with 488 deaths (Figure 2), and with over 1.1 million vaccines administered, meaning that 112% of the population has received at least 2 doses (Global Change Data Lab 2022). Vaccinations are obviously ongoing, and segments of populations around the world who keep resisting them remain the most vulnerable.

Figure 2. Daily New Confirmed COVID-19 Deaths

(For some countries the number of confirmed deaths is much lower than the true number of deaths. This is because of limiting testing and challenges in the attribution of the cause of death.)



Source: Johns Hopkins University CSSE COVID-19 Data.

It is natural that during such critical times, our attention falls on the most vulnerable groups within society. It is the scope of this study to focus therefore on the holistic well-being status of older adults in view of the COVID-19 pandemic. The elderly as a group face vulnerability through a number of factors that need to be evaluated in such times, like: a) psycho-social issues such as loneliness (Cacioppo et al. 2002), social isolation (Gerst-Emerson and Jayawardhana 2015); and mental health wellness overall (Yang et al. 2020); b) advanced age, and c) problems in accessing health care, amongst other issues.

Authorities and policy makers need to attend to a number of aspects that may be important in assisting and safeguarding the elderly in view of this and similar pandemics. Misconceptions about the pandemic (such as that somehow one is immune from contracting the disease) need to be addressed by proper and timely educational systems (Okaka and Omondi forthcoming). A sound and adjustable social policy stems from this reality, and as shown in studies done by Papanikos (2020), such policies do work and should be sought for varied reasons, including the fact that population size and the economy do play a role in explaining variations in deaths per capita, in EU countries. Another point regards the possibility that with so much overwhelming news constantly emerging, there is high risk of missing out the mental health status of the elderly particularly during times of a pandemic (Philip and Cherian 2020).

The present COVID-19 pandemic has been consistently associated with direct and indirect influences on people's mental health, and this with particular reference to vulnerable groups such as the elderly (Hu et al. 2020, Haider et al. 2020). Thus, the objective of this preliminary study was to seek the psycho-social ramifications of the pandemic on the holistic status of the elderly in Malta, and consider which recommendations may be best applicable to the local situation.

Method

Anonymous data was collected by Richmond Foundation Malta (RFM), a local NGO, which has been monitoring the holistic and mental wellbeing of a cross-section of people locally. Descriptive frequencies are made publicly available on the Foundation's website. For the purpose of this study, data collected during an eight-month continuum (April 2020 - March 2021) was analyzed. Each of the eight Time intervals (T1 = April 2020, T2 = June 2020, T3 = August 2020, T4 = October 2020, T5 = December 2020, T6 = January 2021, T7 = February 2021, and T8 = March 2021) contained data from 500 participants. With a 95% confidence interval and a 5% margin of error, this study was totally anonymous, including a clear briefing on the nature of the study. Participants were free to participate and could quit the study with no adversarial consequences. Participation in the study implied consent. Time 1 extended during the first wave of the pandemic while Time 3 saw the start of the second wave, in Malta. Participants' age ranged from 16 - 85 years old. This study focused on data gathered on participants who were within the 65+ year cohort. Gerontologists classify this age boundary as the young-old (Lee et al. 2018).

Findings

The study had slightly more females (53%) than males. Moreover, the mean percentage of respondents who qualified for our study's purposes (65+ year old age bracket) was 17% across all time intervals. Table 1 presents some descriptive statistics on the study's older adults' daily perceptions and feelings with regards to their own and others' safety and health, in view of the COVID-19 pandemic.

Findings clearly outline the increase of anxiety and concerns among the elderly along the progression of the pandemic. This stems from worries about one's own well-being amidst the unpredictable future. It was felt across the board that respondents keenly noticed poor hygiene styles among those around them, which emphasizes the special care humans give to health when faced with a crisis. This also means that being careful for oneself may not be enough in such challenging and taxing situations. Moreover, respondents' concerns related also about the well-being and safety of their families and close friends. The respondents' need to seek out help and to share their own concerns was widely noted in this study's results. In addition to reaching out to others, respondents oriented their attention to seek help from higher powers as well. Solace in prayer was strongly indicated by the elderly across all time intervals, with the 55-64 age cohort reported a 21% increase across all time waves.

Table 1. Perceptions (%) of Respondents on Critical Areas of Their Well-Being by Age-Ranges

	T1	T2	T3	T4	T5	T6	T7	T8
Felt depressed (daily)								
16-24 year old	23	04	19	03	10	10	07	15
25-34 year old	27	14	12	10	06	11	10	11
35-44 year old	22	04	05	08	07	10	08	15
45-54 year old	18	02	05	08	02	06	04	06
55-64 year old	15	05	09	05	09	04	05	06
65+ year old	14	01	14	08	01	09	12	10
Felt lonely (daily)								
16-24 year old	20	07	11	03	09	13	07	17
25-34 year old	15	06	04	07	11	08	06	09
35-44 year old	11	03	08	06	06	13	08	13
45-54 year old	12	05	08	07	05	09	07	05
55-64 year old	06	09	05	04	10	04	04	10
65+ year old	11	05	14	07	06	08	08	08
Healthy Diet (daily)								
16-24 year old	27	41	38	35	37	27	45	34
25-34 year old	29	39	39	29	43	25	47	28
35-44 year old	27	35	35	43	35	39	58	29
45-54 year old	36	49	53	46	56	49	70	40
55-64 year old	57	54	56	65	58	58	61	50
65+ year old	59	44	70	57	72	61	71	58

T1: April 2020, T2: June 2020, T3: August 2020, T4: October 2020, T5: December 2020, T6: January 2021; T7: February 2021; T8: March 2021.

Table 2 presents further descriptive frequencies of the participants' solace in meditation, private prayer, virtual contact with close others, attending to house chores (during lockdown periods), social isolation, loneliness and other relevant variables.

Table 2. Averages (%) of Key Variables across all Age-Cohorts among the 8-pt Study

	T1	T2	T3	T4	T5	T6	T7	T8
Cleaned up the house	29	31	31	31	35	34	44	27
Virtual contact w family/friends	37	33	31	27	29	25	37	28
Found solace in prayer	20	22	29	27	32	28	43	31
Meditated	04	05	09	05	09	05	09	03
Could not get going	19	05	08	05	05	06	07	07
Life required an unusual effort	15	08	12	08	10	08	07	13
More sensitive than usual	18	07	12	08	06	09	08	09
Felt socially isolated	40	23	26	26	29	32	34	40
Stayed away from other people	39	47	62	54	57	55	70	62

T1: April 2020, T2: June 2020, T3: August 2020, T4: October 2020, T5: December 2020, T6: January 2021; T7: February 2021; T8: March 2021.

Indicative to this study are variables related to interpersonal contact with others during semi-lockdown times. Virtual contact with family and/or friends declined by time. Reasons for this may be varied. One must assess whether the old adults grew weary and tired of using social media platforms for their virtual contact with their dear ones, and if this were so, whether this occurred because perhaps such platforms are not user-friendly, or maybe they need updating and more interactive versions.

More worrying is the fact that increasingly more participants stayed away from people. This could have been done in order to help protect oneself from unnecessary risk of infection. Nevertheless, one by-product of this situation is that individuals feel more isolated. In fact, participants' feelings of socially isolated remained constant across the time intervals under our study.

During any crisis, such as the COVID-19 pandemic, self-care presents a complex challenge to vulnerable populations. Although it is generally hoped that each sector within society abides by certain healthy lifestyles, this may not always be possible in all spheres, especially when considering that the resources, both at the macro (national) and micro level (family dynamics, elderly and other persons who live alone, etc.) could be easily strained excessively. Findings from this survey indicate that the picture may not be so straightforward. Commendable is the result that respondents aged 65+ heightened their healthy life-style attitudes (physical exercise, keeping a routine, healthy diet), together with increased vigilance and maintained their regular house-chores.

COVID-19 had mixed effects on respondents' own emotions. On one hand, it is promising to note a steady increase in feelings of happiness and hopefulness. This was furthered by a decrease of fear and depression over time. Intriguingly, loneliness increased especially for the 55-64 year group. Loneliness is borne from many variables, including social isolation, which has been found in research globally as one of the main consequences of this pandemic (Cao et al. 2020, Mukhtar 2020). Restless sleep is closely related to this aspect. Restless sleep showed fluctuating results, with a dip towards the last two waves. This could be a result of the roll out of vaccines, especially to the elderly, during that time. Participants' own rating of happiness, albeit quite steady across all time waves, saw a sharp decrease from Time 7 to the latest Time 8.

Discussion

This study highlights a number of outcomes that require special mention. As COVID-19 pandemic progressed, with more research, news analysis and caution about its dangerous effects, more concern and anxiety became refined. The roll-up of vaccines did surely help; however, vigilance should never be abated because such emergencies warrant no room for complacency.

Another key result that emerged was that the handling of the COVID-19 situation locally was first perceived as lax. This was during the first wave of the pandemic, when people were deeply affected and also scared with what was happening in nearby Italy and surrounding countries, where the full bite of the

pandemic started being mostly felt. Eventually, the elderly's perception on the local authorities' handling of the situation improved, especially from Time 5 to date. It must be noted that in Malta, the authorities sanctioned no full lockdowns, but only two partial ones, while striving successfully to attend meticulously to the economic wheel of the country. Moreover, considering that this global pandemic entailed that most governments had to learn how to deal with circumstances as time progressed, it was a given that an amount of anxiety was incorporated in this process. As a natural consequence, an element of lack of peace of mind in the general population was involved. Research found that personal worries and anxiety about the pandemic was correlated to a decline in trust in societal institutions, which resulted in more acute mental health problems and loneliness (Van Tilburg et al. 2020).

Further analysis of the results presents two domains which relate to human self-defense responses in difficult times, relating to our survival instincts. Azar (2010) strongly points at the fact that humans search for meaning-making variables especially in unpredictable times and uncertain days. Thus, results recommended the intrapersonal (innermost) and the interpersonal (relational) domains.

Because pandemics and similar global afflictions have a significant impact on psychosocial realities (Banerjee 2020), it is reasonable that a crucial human reaction would address the intrapersonal or innermost domain. It is part of our survival strategy that when faced with a threat, we naturally become more attentive to our own needs. Findings from this study point to this realm. For example, an increase in self-care tendencies was strongly recognized (including more physical exercise, maintaining a routine, adhering to a healthy diet, house chores, etc.). This could have been a way to cope with some mental health effects resulting from an increase in loneliness, due to social isolation, especially during the semi-lockdown periods.

The second major reality resulting from our human response when faced with existential threats relates to the interpersonal or relational domain. Results from this study point at the respondents' concern about one's own and others' well-being in such critical times. One's relationship outside oneself extends even to resorting to supernatural help (prayer and meditation). A sizable 45% of respondents found solace and strength in their faith or through prayer. Galea (2012) has highlighted the relevance of spirituality in critical moments, especially when this reality is deemed important and relevant by the affected individuals. Religious services streamlined on the internet and on a number of social media platforms are another way how elderly may also keep up-to-date with their own religious activities and virtually in touch with their respective religious communities. Staying socially connected, even remotely, is crucial. It is perhaps a great irony in life, that it is in times of distress and crises that humans reach out to others (for help and solace), whereas in times of material wellness, the opposite may be true!

Health anxiety, panic, adjustment disorders, depression, chronic stress, and insomnia are the major offshoots. Misinformation and uncertainty may give rise to mass hysteria. Banerjee (2020) suggested that lessons from earlier pandemics like SARS have proved that regular telephonic counseling sessions, healthy contact with the family, relevant, correct, and updated information, caring for general

medical and psychological needs, and respecting their personal space and dignity are important components of mental health care in the elderly.

Recommendations from the Findings

Considering the vulnerability that elderly individuals have to face, particularly in such difficult times, a number of suggestions are in place.

First, it is of paramount importance that society learns from such tragic instances in order to be well equipped should or when similar events occur in the future. Society must be ready to address the needs and holistic wellbeing of the vulnerable groups within it, especially the elderly (Li et al. 2014, Mukhtar 2020). This pandemic's impact excused no one. The elderly's mental health was seriously impacted, and thus calls for better attention in the future (Cao et al. 2020, Douglas 2020). Quarantine was especially challenging (Brooks et al. 2020), resulting in depression and at times even suicide (Rajkumar 2020, Djernes 2006). Indeed, no one was spared from the emotional footprint (Montemurro 2020), but the elderly and other vulnerable groups deserve more assiduous consideration in such critical times. Addressing the mental well-being of the elderly entail routine and structure (in bedtime, waking times, meal times, activity times, and "online" times, staying physically and cognitively active, amongst others), while paying attention to issues that may preclude this process. An overwhelming exposure to media news may be one such problem. Education in this aspect is called for. Checking in regularly on the aging adults in one's life is another key suggestion that no society should ignore (Grech et al. 2020, Scerri et al. 2021). Attention against the use, or rather misuse, of alcohol as self-medication, is also warranted (Schonfeld and Dupree 1994).

Secondly, the COVID-19 pandemic among the elderly is truly a case for closing the digital divide (Van Jaarsveld et al. 2020). More education and appropriate information will hopefully disentangle the intricacies and challenging language inherent in social media and internet as a whole. The present COVID-19 pandemic has challenged people everywhere to learn to make better use of the internet technology in view of challenges hardly ever seen before in our times (Patsoule and Koutsabasis 2014). Results from this study go even further, and point at the high relevance and importance of making familiar such social media platforms where religiosity is concerned. Considering the fact that the geriatric population increasingly adds up to a sizeable proportion of the general population, a fact in Malta as in many other countries, and also acknowledging that this cohort in Malta is very religious, thus availing such religious technology to them, regularly, augurs better to their holistic well-being. This component will surely complement the fact that internet technology is shared progressively in all spheres of society, to make it more important and relevant than ever (Leonardi et al. 2008).

Conclusion

In conclusion, the psycho-social impact on the elderly by the COVID-19 in Malta is similar to that found elsewhere as pointed out in research. Higher anxiety and stress levels were associated with a higher need to take care of one's own needs, and creative ways to relate to others (family members and friends), which is a natural tendency. Finally, this study calls for a more holistic attention to the needs of older adults within society, with a number of practical recommendations. A society's true colors are evident in how it attends and responds holistically to its members' needs, particularly the vulnerable groups within it.

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Relationship between Stress Perceived and Gastrointestinal Symptoms in Intensive Care Nurses during COVID-19 Pandemic: A Cross-Sectional Study

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The purpose of this study is to determine the relationship between perceived stress and gastrointestinal (GI) symptoms during the COVID-19 outbreak in the intensive care unit (ICU) nurses. This cross-sectional study was conducted with 170 nurses working in the ICUs of a hospital in eastern Turkey. Descriptive, chi-square and multiple linear regression analyses were used to analyze data. In the last three months, 48.2% of the nurses had complaints such as heartburn, 44.1% abdominal distension, 41.7% diarrhea/ constipation. The mean perceived stress level experienced by the nurses was found to be 29.30 ± 5.73 . Results from regression analysis included perceived stress score, gender, perceived health status, diet, having been infected with COVID-19 before and risk degree of the ICU in question in terms of COVID-19 revealed a statistically significant associated with scores obtained from GI symptoms. Perceived stress level, health perception status, having been infected with COVID-19 before and the high-risk status of the intensive care unit in question for COVID-19 were predictive factors for the occurrence of gastrointestinal symptoms. These findings may provide a basis for creating a healthy work environment where factors contributing to work-related stress are reduced and coping strategies are developed.

Keywords: *gastrointestinal symptoms, intensive care, nurses, stress*

Introduction

COVID-19 is an infectious disease that emerged in the city of Wuhan in China in late 2019 and caused a pandemic afterward (Bonilla-Aldana et al. 2020). Although most patients suffering from COVID-19 infection recover easily and without complications, it is reported that 14% of patients require hospitalization and oxygen support, and 5% require hospitalization at an intensive care unit (ICU). Therefore, ICUs are an important step in the fight against the COVID-19 pandemic which is rapidly enveloping the whole world (Bulut and Özyılmaz 2020, Rothan and Byrareddy 2020, Wang et al. 2020, Zhu et al. 2020). During the COVID-19 pandemic; Patients diagnosed with COVID-19 can be treated not only in COVID-19 ICUs, but also in other ICUs. Therefore, healthcare professionals working in all ICUs are at risk (Bulut and Özyılmaz 2020, Wang et al. 2020).

Among healthcare officials, nurses are professionals who communicate and spend time with patients most. Historically speaking, nurses are seen to be in the frontlines in the fight against all epidemics, not only in the fight against the COVID-19 pandemic. In the fight against the pandemic, nurses are at risk while performing treatment and care, and therefore, they experience intense stress. ICU nurses, taking key roles and tasks in the fight against the pandemic, face many

difficulties in this process (Choi et al. 2020, Kıraner and Terzi 2020, Kıraner et al. 2020, Wu et al. 2020). Wearing personal protective equipment during long working hours, lack of adequate equipment, fear of getting infected with the illness for themselves and their families, serious increase in workload, prolonged working hours, inability to meet/postpone their basic needs during working hours are some of the problems that ICU nurses are exposed to during this period (Greenberg et al. 2020, Kıraner and Terzi 2020, Kıraner et al. 2020). Moreover, many nurses have been infected with COVID-19 and died in this period (Kıraner and Terzi 2020, Kıraner et al. 2020). These problems are a serious source of stress for ICU nurses. Stress, defined as the reaction of the organism against any change that puts pressure on the organism, appears as a factor that causes especially functional diseases of the gastrointestinal system, triggers these diseases and sometimes makes them chronic (Kim et al. 2017, Lee et al. 2011, Spoorthy et al. 2020, Turan et al. 2017). While experiencing stress, changes also occur in relation to a decrease in upper gastrointestinal system motility and an increase in acid secretion and lower gastrointestinal system motility (Gao et al. 2020, Turan et al. 2017). Gastrointestinal symptoms (GI) have negative effects on daily routines and quality of life, and result in higher rates of utilization of healthcare (Lee et al. 2011, Turan et al. 2017).

When the literature is examined, perceived stress is seen to be accepted as the most significant predictive factor for GI symptoms (Afshar et al. 2015, Lee et al. 2011, Turan et al. 2017). However, it is known that factors such as age, work-related stress and shift working also have an effect on GI symptoms (Eskin et al. 2013, Lee et al. 2011, Turan et al. 2017, Zandifar et al. 2020). Stress-related GI symptoms are common worldwide, and the incidence of GI symptoms varies between 35% and 70%. The most common GI symptoms are upper GI dysmotility symptoms (Çam and Nur 2015, Greenberg et al. 2020, Qin et al. 2014).

In this context, this study was conducted to determine the relationship between the perceived stress and GI symptoms during the COVID-19 outbreak in ICU nurses, who are in the frontlines in the fight against the pandemic. This study is unique in that it is the first study on this particular topic. It is believed that the results of this study will make a significant contribution to the literature.

Research Questions

1. What are the GI symptoms that ICU nurses experience during the COVID-19 pandemic?
2. Is the perceived stress in ICU nurses associated with GI symptoms during the COVID-19 pandemic?
3. What are the factors associated with GI symptoms that occur in ICU nurses during the COVID-19 pandemic?

Materials and Methods

Design

This cross-sectional study was performed in a hospital in eastern Turkey, providing health services. Reporting rigour was demonstrated using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist.

Population and Sample

While the population of the study was composed of all nurses working at the ICUs of the Malatya Research and Training Hospital, the sample of the study consisted of 200 nurses who agreed to participate in the study and met the inclusion criteria. No sampling method was used. The data collection instruments were applied to all nurses, and 85% (n: 170) of the population participated in the study. The data of the study were collected by the researchers between October 2020 and January 2021 by the face-to-face interview method. There wasn't any lockdown for nurses that could create a hassle to travel to the hospitals throughout the study.

Inclusion Criteria

All ICU Nurses

- No history of GIS disease (such as gastritis, ulcer, reflux, ulcerative colitis, Crohn's disease, irritable bowel syndrome and gastrointestinal cancers).
- Working on the day and hours of the study.
- Did not diagnosed with any psychological disorders or chronic diseases.
- Not on annual leave or on sick leave were included in the study.

Data Collection Tools

The data of the study were collected using a Personal Information Form, the Perceived Stress Scale (PSS) and the Gastrointestinal Symptoms Questionnaire.

Personal Information Form

In the form created by the researchers by reviewing the literature, the sociodemographic characteristics of the participants (age, gender, marital status, having or not having children, perceived health status, having been infected with COVID-19 before or not, diet) and information on their intensive care experience (ICU they worked for, duration of ICU experience, hours worked on a shift, number of patients cared for on a shift, risk degree of the ICU in question in terms of COVID-19, status of caring for individual diagnosed with COVID-19) were questioned, and the form consisted of 13 questions (Çam and Nur 2015, Lee et al., 2011, Zandifar et al. 2020).

Perceived Stress Scale (PSS)

This scale was developed by Cohen et al. (1983) to measure how stressful some situations in the last month of a person's life are perceived (Cohen et al. 1983). Feelings and thoughts in the last month are questioned by the scale. PSS has three forms consisting of 14, 10 and 4 items each. In this study, the 10-item PSS was used. Each item in the scale is evaluated with a 5-point Likert-type scoring ranging from "Never (0)" to "Very often (4)". PSS scores are obtained by reversing four positive items and then summing up all scale items. Possible PSS-10 scores are between 0 and 40. Higher scores indicate higher levels of perception of stress. In the adaptation of the scale into Turkish carried out by Eskin et al. (2013), the Cronbach's Alpha internal consistency coefficient of the scale was calculated as 0.84. The Cronbach's Alpha internal consistency coefficient in this study was determined to be 0.86.

Gastrointestinal Symptoms Questionnaire (GSQ)

GSQ consists of 16 items regarding the frequency of GI symptoms that may be disturbing in the last three months. The questionnaire is in the form of a 5-point Likert-type scale, and it is scored according to the frequency of symptoms ["Never (0)" – "Very often (4)"]. The symptoms consist of five categories as esophageal symptoms (heartburn and/or dysphagia), upper gastrointestinal dysmotility symptoms (at least one of the following symptoms: early feeling of satiety, postprandial bloating, abdominal distention, nausea or vomiting), intestinal symptoms (at least one of the following symptoms: diarrhea/constipation, more than 3 occasions of defecation per day, profuse or watery defecation, feeling of urgent need to defecate, fewer than 3 occasions of defecation per week, hard or lumpy defecation or feeling of stuffiness), diarrhea (more than 3 occasions of defecation per day, profuse or watery defecation or feeling an urgent need to defecate) and constipation (at least one of the following symptoms: fewer than 3 occasions of defecation per week, hard or lumpy defecation, feeling of anal obstruction) It is stated that the Cronbach Alpha internal consistency coefficient of the questionnaire is 0.75 (Drossman et al. 1993). The Cronbach Alpha internal consistency coefficient in this study was found to be 0.76.

Data Analysis

The data were analyzed using the SPSS 25.0 package program. Conformity of measurable data to normal distribution was tested by using Shapiro-Wilk test. The data were expressed as frequency and percentage for the descriptive analyses. Comparison of the categorical variables between groups with and without GI symptoms was performed using Chi-squared test. The perceived stress quartiles of those with and without GI symptoms were analyzed using Chi-squares test for comparison of the categorical variables between groups. Pearson correlation analysis was used to measure the relationships between GI symptoms and perceived stress. Multiple linear regression analysis was performed to determine

predictors of GI symptoms. Linear regression analysis was applied on the variables found to be significant in the binary analyses. The results were considered statistically significant when $p < 0.05$.

Ethical Approval

In order to carry out the study, ethics committee approval was obtained from the İnönü University Non-Invasive Studies Ethics Committee (2020-08/15), and institutional permission was taken from the hospital where the study was carried out. Verbal consent was received from the individuals participating in the study, and the individuals were informed that their personal information would not be shared with others, they were free to participate in the study, and they could leave the study at any time.

Scientific Basis and Validity

In the literature, it is reported that infectious diseases are some of the important sources of stress faced by healthcare professionals (Greenberg et al. 2020, Kıraner and Terzi 2020, Kıraner et al. 2020). It is stated that there is a relationship between perceived stress and GIS symptoms. High perceived stress levels increase the incidence of GI symptoms (Babaoğlu and Özdenk 2017, Çam and Nur 2015).

Results

Descriptive Characteristics

Table 1. *Distribution of the Nurses' Sociodemographic Characteristics and Intensive Care Experience (N=170)*

Sociodemographic Characteristics	n (%)	Intensive Care Experience	n (%)
Age		Intensive care unit they worked at	
20-25	50 (29.4)	Reanimation ICU	40 (23.5)
26-31	100 (58.8)	Cardiology ICU	32 (18.8)
32-37	20 (11.8)	Internal Medicine ICU	19 (11.2)
Gender		Cardiovascular Surgery ICU	25 (14.7)
Male	60 (35.3)	COVID-19 ICU	54 (31.8)
Female	110 (64.7)	Duration of intensive care unit experience	
Marital status		1-5 years	47 (27.7)
Married	75 (44.2)	6-10 years	98 (57.6)
Single	95 (55.8)	11-15 years	25 (14.7)
Having children		Hours worked on a shift	
Yes	50 (29.4)	8 hours	102 (60.0)
No	120 (70.6)	24 hours	68 (40.0)
Perceived health status		Number of patients cared for on a shift	
Good	50 (29.4)	1-5 individuals	98 (57.6)
Moderate	95 (55.8)	5-9 individuals	72 (42.4)
Bad	25 (14.8)	Risk degree of the intensive care unit in question in terms of COVID-19	

Infected with COVID-19 before		High risk	60 (35.3)
Yes	70 (41.2)	Moderately risky	78 (45.9)
No	100 (58.8)	Low risk	32 (18.8)
Diet		Status of caring for COVID-19 patients	
Adequate-Balanced Diet	73 (42.9)	Yes	78 (45.9)
Fast food diet	97 (57.1)	No	92 (54.1)
Total	170 (100.0)	Total	170 (100.0)

It was found that 58.8% of the nurses were at the ages of 26-31, 64.7% were female, 55.8% were single, 70.6% did not have any children, 55.8% stated their perceived health status as moderate, 58.8% had not been infected with COVID-19 before, and 57.1% adopted a fast-food diet. It was also found that 31.8% of the nurses worked at COVID-19 ICUs, 57.6% had 6-10 years of working experience, 60.0% had 8 hours of work on a shift, 57.6% cared for 1-5 patients on a shift, 45.9% stated that the ICU where they were working was moderately risky in terms of COVID-19, and 54.1% had provided care to individual diagnosed with COVID-19. The mean perceived stress level of the nurses was found to be 29.30±5.73 (Table 1).

Distribution of Gastrointestinal Symptoms

Table 2. *Distribution of Gastrointestinal Symptoms (N=170)*

Gastrointestinal Symptoms	Never n (%)	Rarely – Sometimes n (%)	Often – Very Often n (%)
Abdominal Pain	27 (15.9)	100 (58.8)	43 (25.3)
Esophageal Symptoms			
Dysphagia	49 (28.8)	77 (45.3)	44 (25.9)
Heartburn	37 (21.8)	51 (30.0)	82 (48.2)
Upper GI Dysmotility Symptoms			
Early Feeling of Satiety	69 (40.6)	65 (38.2)	36 (21.2)
Postprandial Bloating	35 (20.6)	78 (45.9)	57 (33.5)
Abdominal Distention	30 (17.7)	65 (38.2)	75 (44.1)
Nausea	43 (25.3)	98 (57.6)	29 (17.1)
Vomiting	61 (35.9)	94 (55.3)	15 (8.8)
Intestinal Symptoms			
Diarrhea / Constipation	19 (11.2)	80 (47.1)	71 (41.7)
Number of Daily Defecations >3	95 (55.9)	50 (29.4)	25 (14.7)
Profuse or Watery Defecation	71 (41.8)	79 (46.5)	20 (11.7)
Feeling of Urgent Need to Defecate	66 (38.8)	81 (47.6)	23 (13.6)
Number of Weekly Defecations <3	74 (43.5)	53 (31.2)	43 (25.3)
Hard or Lumpy Defecation	45 (26.5)	86 (50.6)	39 (22.9)
Feeling of Anal Obstruction	99 (58.2)	60 (35.3)	11 (6.5)
Fecal Incontinence	102 (60.0)	59 (34.7)	9 (5.3)

It was found that, in the last three months, 48.2% of the nurses had heartburn, 41.7% had diarrhea/constipation, 44.1% had abdominal distention, 33.5% had postprandial bloating, 25.9% had dysphagia, 25.3% had abdominal pain and fewer than 3 weekly defecations, 22.9% had hard or lumpy defecation, 21.2% had early feeling of satiety, 17.1% had nausea, 14.7% more than 3 defecations per day, 13.6% had a feeling of urgent need to defecate, 11.7% had profuse or watery defecation, 8.8% had vomiting, 6.5% had feeling of anal obstruction, and 5.3% had fecal incontinence problems often or very often (Table 2).

The Occurrence of Gastrointestinal Symptoms

Table 3. *The Occurrence of Gastrointestinal Symptoms (N=170)*

	Items	No Symptoms n (%)	1-2 Symptoms n (%)	≥3 Symptoms n (%)
GI Symptoms	16	33 (19.4)	95 (55.9)	42 (24.7)
Esophageal Symptoms	2	39 (22.9)	109 (64.1)	22 (13.0)
Upper GI Dysmotility Symptoms	5	57 (33.5)	94 (55.3)	19 (11.2)
Intestinal Symptoms	8	21 (12.4)	104 (61.2)	45 (26.4)
Diarrhea Symptoms	3	58 (34.1)	70 (41.2)	42 (24.7)
Constipation Symptoms	3	35 (20.6)	82 (48.2)	53 (31.2)

*All symptoms counted if reported to occur often or very often.

Among the nurses, 137 (80.6%) reported multiple GI symptoms. Among these nurses, 42 (24.7) nurses reported over three GI symptoms. In particular, 149 (87.6%) nurses reported bowel symptoms, 131 (77.1%) reported esophageal symptoms, and 113 (66.5%) reported upper GI dysmotility symptoms (Table 3).

Comparison of Gastrointestinal Symptoms by Perceived Stress Levels

Table 4. *The Relationship between Gastrointestinal Symptoms and Perceived Stress Levels (n=170)*

	r *	p **
GI Symptoms	0.780	0.021
Esophageal Symptoms	0.756	0.019
Upper GI Dysmotility Symptoms	0.881	0.034
Intestinal Symptoms	0.748	0.015
Diarrhea Symptoms	0.843	0.040
Constipation Symptoms	0.802	0.016

*Pearson correlation test; ** <0.05.

There was statistically significant relationship between GI symptoms and Perceived stress scores obtained from the participants ($p > 0.05$) (Table 4).

Table 5. *The Results of the Multiple Regression Model Created with Perceived Stress Level and Some Variables that Affect the Occurrence of GI Symptoms (n=170)*

Variables	β	t	p	VIF
Constant	0.914	0.604	0.025	
Stress	0.823	1.236	0.016	1.003
Gender (female)	0.520	0.689	0.019	1.082
Perceived health status (bad)	0.705	1.310	0.037	1.304
Diet (Fast food diet)	0.632	1.020	0.042	0.952
Previous COVID-19 infection status (yes)	0.468	0.735	0.010	0.866
Risk degree of the intensive care unit in question in terms of risk (high)	0.767	0.301	0.023	1.283

R=0.818; R²=0.704; F=29.216; p<0.05.

Multiple linear regression analysis was performed to explain the predictive effect of some descriptive features of individuals participating in the study on GI symptoms. The model was found to be statistically significant in terms of the significance level corresponding to the F value (F=29.216; p<0.05). When the t coefficient and significance levels of the independent variables were examined; perceived stress score (p=0.016), gender (p=0.019), perceived health status (p=0.037), diet (p=0.042), having been infected with COVID-19 before (p=0.010) and risk degree of the ICU in question in terms of COVID-19 (p=0.023) appear to have a statistically significant effect on scores obtained by GI symptoms. It was seen that 62.4% of the change on the scores obtained with GI symptoms was explained by the scores obtained in nurses' these features (R=0.818; R²=0.704) (Table 5).

Discussion

Although there are many studies in the literature examining the effects of perceived stress on GI symptoms (Babaoğlu and Özdenk 2017, Çam and Nur 2015, Lee et al. 2011, Özdenk and Kazım 2019), there is no study examining the effects of perceived stress experienced by nurses and some factors on GI symptoms during the COVID-19 pandemic period. Therefore, the findings of the study are discussed here along with the results of other similar studies.

It was seen that the majority of the nurses participating in this study were 26-31 years old, female and single, did not have any children, and approximately half of them stated their perceived health status as moderate and had not been infected with COVID-19 before. In a study examining the perceived stress levels experienced by oncology nurses, it was seen that almost all nurses were male, their mean age was 34.94±9.00, and approximately half of them were married (Onan et al. 2015). The reason why some sociodemographic characteristics of nurses differ from each other in studies is thought to be the fact that mostly young nurses work at ICUs in Turkey.

In our study, it was found that 80.6% of the nurses experienced at least one GI symptom, and 24.7% experienced at least three GI symptoms in the last three months. It was determined that the vast majority of the nurses experienced the

symptoms of heartburn, diarrhea/constipation and abdominal distension, respectively, often or very often in the last three months. When the literature was examined, studies on this topic carried out mostly on students were found. In these studies, it was found that 70.2% of nursing students, 78.7% of nursing/ midwifery students and 65% of students of schools of education experienced at least one GI symptom (Babaoğlu and Özdenk 2017, Çam and Nur 2015, Lee et al. 2011). Previous studies have reported that upper GI dysmotility symptoms are the most common type of GI symptoms (Babaoğlu and Özdenk 2017, Çam and Nur 2015, Lee et al. 2011). The difference in the results of the studies is thought to have been caused by the difficulty in ICU working conditions during the COVID-19 process and different personal characteristics. As a matter of fact, 40% of the nurses are on duty for 24 hours in this study. This condition is thought to affect feeding, toilet habits and increase gastrointestinal symptoms.

According to this study, the perceived stress level was determined to be high. When a nursing study conducted before the COVID-19 pandemic period was examined, it was seen that the perceived stress experienced by nurses was much lower (Onan et al. 2015). When studies carried out during the pandemic period were examined, it was seen in a study conducted with healthcare workers that 81.7% of the participants reported moderate or high levels of perceived stress (Chekole et al. 2020). Likewise, in a study conducted with healthcare workers, the highest stress levels were found to be among nurses (Babore et al. 2020). Again, in a study conducted by Pasay during the pandemic period, it was determined that a moderate level of stress was perceived by the participants (Pasay-An 2020). The COVID-19 pandemic period has caused physical, psychosocial and politico-economic effects on ICU nurses. Nurses firstly had to manage an epidemic whose nursing management they had never experienced before, and they were also exposed to a high risk of contamination from nursing interventions with the highest risk of droplet spread (Benke et al. 2020, Kıraner and Terzi 2020, Kıraner et al. 2020, Pasay-An 2020). The results of this study and other studies conducted during the pandemic period were similar. It is thought that the increase in the perceived stress level experienced by nurses in studies is related to the difficulties that ICU nurses experience during this period.

In this study, it was determined that, as the perceived stress scores by the nurses increased, the incidence of GI symptoms also increased. A positive significant relationship was found in the correlation analysis conducted between perceived stress and GI symptoms. There are many studies in the literature indicating that there is a relationship between GI symptoms and perceived stress (Babaoğlu and Özdenk 2017, Çam and Nur 2015, Lee et al. 2011, Özdenk and Kazım 2019). Stress threatens homeostasis and consequently causes the balance of the GI system to deteriorate (Babaoğlu and Özdenk 2017, Lee et al. 2015, Özdenk and Kazım 2019, Pasay-An 2020). The similarity between this study and other studies in the literature confirmed that stress is a predictive factor for GI symptoms.

In the current study, some variables that may be determinant in predicting the GI symptoms of ICU nurses and their perceived stress were modeled by multiple linear regression Analysis. According to the regression analysis results, the occurrence of GI symptoms was increased by the higher the average score,

previous COVID-19 infection status, the high-risk status of the ICU in question for COVID-19, poor perceived health status, malnutrition and being female, respectively. Similar to this study, other studies have concluded that increased stress quartiles and poor health status were predictors of GI symptoms (Çam and Nur 2015, Lee et al. 2011, Özdenk and Kazım 2019). The perception of health is based on individuals' general evaluations of their own health conditions, and it is a simple but powerful indicator that reflects the multidimensionality of health and enables the individual to evaluate their biological, mental and social state by themselves (Altay et al. 2016). The result of this study supported this information. In the literature, it was reported that permanent damage occurred in many systems in those who underwent COVID-19, and as for the gastrointestinal system, GI symptoms such as diarrhea, vomiting and abdominal pain were observed in a considerable number of patients (Xiang et al. 2020, Xiao et al. 2020). Similarly, in this study, it was found that the nurses who had been infected with COVID-19 before had more GI symptoms. It is thought that the finding here that working at a highly risky ICU in terms of COVID-19 was a determining factor on GI symptoms may have been due to rush working hours, lack of adequate protective equipment, increased daily stress, inability to take care of one's personal health and the risk of disease transmission faced by loved ones (Kıraner and Terzi 2020, Kıraner et al. 2020). It has been reported that GI diseases often occur in individuals who adopt a fast-food diet (Bonham et al. 2016, Nea et al. 2018, Xiang et al. 2020). It is reported that nurses adopt a fast-food diet, a low-quality diet or irregular eating habits due to reasons such as prolonged standing, shift working, excessive workload, time pressure, difficult or complex tasks, insomnia and insufficient rest breaks on shifts depending on the intensity of service (Bonham et al. 2016, Nea et al. 2018). The result that GI symptoms were seen more frequently in the nurses who adopted a fast food diet, which was also concluded in this study, confirmed this information (Cho et al. 2013, Nea et al. 2018).

Limitations

The fact that the sample consisted of ICU nurses working at only one hospital was a limitation of the study. The result of the study may not be generalized to all ICU nurses. In addition, the cross-sectional design of the study did not allow the examination of causality and it was not possible to analyze the long-term evolution of specific changes. A longitudinal study can solve this problem. Other factors that could contribute to stress of the nurses were not evaluated in the study. There weren't any information regarding psychological, behavioral, cognitive, reactions occurring before, during, or after pandemic. There weren't any other psychological assessment for the nurses except for Perceived Stress Scale.

Conclusion

It was found that the incidence of GI symptoms and the incidence of perceived stress were high in the nurses who participated in this study. Perceived stress level,

perceived health status, previous COVID-19 infection status and working at a highly risky ICU in terms of COVID-19 were found to be significant predictive variables in the occurrence of GI symptoms.

Implications for Nursing Practice

In line with these results, it is recommended to evaluate nurses in terms of GI symptoms, provide the necessary support for ICU nurses in stress management and coping strategies to reduce perceived stress, improve their working conditions and conduct studies in larger nurse groups. These findings may also provide a basis for creating a healthy work environment where factors contributing to work-related stress are reduced and coping strategies are developed. Improvement in the environment can be initiated by the nurse administrators by establishing policies and procedures. For ICU nurses, activities such as professional mediation and social support as well as increasing peer support systems at workplaces can be inexpensive measures to reduce perceived stress and associated GI symptoms (Yıldız 2021). In this context, consultation and liaison psychiatric nurses can develop a plan to increase nurse awareness on strategies for stress reduction and coping behaviors, as they have a deep-rooted knowledge of the nature of psychiatric dynamics (Alharbi and Alshehry 2019, Yıldız 2021).

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Deaths Due to COVID-19, Lockdowns, Vaccinations and Weather Temperatures: The Case of Greece

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The aim of this paper is to present Greek daily descriptive statistics on confirmed deaths due to COVID-19, the days of lockdown and their effect on the number of deaths, the outcomes of vaccinations and the influence of weather temperatures. Do lockdowns work in bringing the number of deaths down? The descriptive evidence shows that this is the case even though there is a considerable lagged effect. On the other hand, vaccinations, during the time period of examination, do not seem to have diminished the number of deaths, but the reason might be that it takes time for their full effect to occur. Finally, this paper also examines the hypothesis that during the summer months the daily deaths from COVID-19 are relatively lower than during the winter months. Using average daily weather temperatures, this hypothesis cannot be falsified. Simple calculations of the functional relation between weather temperatures and deaths show that temperatures above 28.5 degrees Celsius (°C) were associated with zero deaths.

Keywords: COVID-19, deaths, Greece, lockdown, pandemic, vaccinations, weather temperatures

Introduction

Pandemics were always here on earth along with many other natural disasters.¹ They come and go. Historically, the most famous pandemic was the plague which hit Athens in 430 BCE (Papanikos 2021b). Since then, pandemics have appeared many times in history. As in ancient Athens, these pandemics have had harmful effects on the economy, society, demographics (population) and ethics.²

The current pandemic is not an exemption. Individuals' and states' reactions to COVID-19 are no different from the individual, social and political reactions of the pandemic that hit Athens 2,500 years ago. That plague lasted for three years before it disappeared altogether as so eloquently all of these are described by Thucydides in his work on *The Peloponnesian War*. I have examined elsewhere these issues, including Thucydides' account of the ancient plague and the European

¹Wars, as mentioned by Hesiod's magnum opus *Works and Days*, are the worst of all disasters, but these are man-made disasters and not natural ones. One may also argue that the deleterious effects of natural disasters depend, to a certain extent, on human actions and behaviors.

²Not all effects are detrimental though. Pandemics may force the humanity to invest into new pharmacies which might have more general beneficial applications. On the other hand, pandemics, similar to wars, have produced some of the best-known works in literature, e.g., *The Decameron* (1353) by Giovanni Boccaccio; *A Journal of the Year of the Plague* (1720) by Daniel Defoe; *The Plague* (1947) by Albert Camus and many others. Without a real pandemic, these works might not have been written, and all future generations would have lost the opportunity to read these masterpieces. If reading good pieces of literature is an investment in human capital, as I believe it is, then one must compare the cost of the pandemic with all these losses of human capital of all future generations.

Union's efforts to harmonize economic and social policies to cope with COVID-19 (Papanikos 2020a, 2020b, 2020c, 2020d, 2021a, 2021b). Examples of economic and social policies are the recovery plans currently implemented by the European Union, the vaccine distribution channels organized at the European Union-level and the establishment of a European vaccination passport.

Since the pandemic struck the world in late 2019 and in early 2020, another "pandemic" infected the world of academics, i.e., writing about the COVID-19 itself. In just one year, the literature on COVID-19 has mushroomed. All aspects of the current pandemic have been examined. The theme "infected" all academic disciplines and the "cases of these infections" are multiplied at a geometric rate. As a matter of fact, I was one of the first infected and started writing and publishing on the issue of COVID-19.

The Athens Institute for Education and Research (ATINER) received quite a few dozens of papers either to be considered for presentations at one of its many small academic events organized throughout the year, and/or to be considered for publication in one of its journals. This time, the presentations were done remotely thanks to Prometheus, who provided the technology. In just a few months, those who had the property rights in these technologies became billionaires. Who says that COVID-19 had only negative effects? For some people, the pandemic was a blessing.

Papers accepted for publication in one of ATINER's journals examined the economic aspects of the pandemic (Adejare et al. 2021, Jones and Comfort 2020, Uwah et al. 2021); the health and medical aspects (Parodi et al. 2021, Uysal et al. 2020); the social dimensions (Bäckman 2021, De Falco et al. 2021, Jurić 2021); the communication facets (Mengu et al. 2021, Osisanwo 2021); the legal implications (Marchetti 2021); and the educational adjustments (Güvercin et al. 2021, Kılıç 2021, Pinchbeck and Heaney 2021). Of course, these do not exhaust the literature, but here they are given as examples of the types of studies written to account for the unexpected phenomenon of COVID-19. Unexpected not in terms of the occurrence of the event, which is unavoidable, but of its exact timing. Those who claim that they have predicted the coming of a pandemic, they simply meant that pandemics will re-appear again in the future. Prognosis and prediction, in order to be useful, must include the time framework of the event. Otherwise, it has the same value as the prognosis that *one day* we will all die from something.

It goes beyond the scope of this short paper to review this huge literature. The purpose of this study is to examine some preliminary empirical evidence of the effects of lockdowns, vaccinations and weather temperature variations on the daily death outcomes of COVID-19 in Greece. Since this is an ongoing process, the descriptive statistical evidence and the results should be interpreted with caution. This is of particular significance when the effects of vaccinations are analyzed. Their expected positive influence in reducing the daily number of deaths will take time to materialize, and currently we are in the beginning of the process. After a few months and when all lockdown measures are completely lifted, then the full effect of vaccinations can be appraised. I should point out at the outset that the discussion, primarily the one on the effects of vaccinations, relate to short run

outcomes (less than a year). Nobody knows the medium or long run effects of COVID-19 immunization, or of the disease itself.

In this exploratory study, Greek data are used primarily because of my familiarity with the current developments in the country. It is really very difficult to evaluate policy effects if the researcher does not have a knowledge and a feeling of the social and cultural environment. Nevertheless, my interpretation of this environment may not be appropriate and could become an issue of dispute. Looking at the effects in only one country has its own benefits as well because other concurrent influences can be isolated. This may include the quality and the quantity of health and hospital services; weather conditions; sociocultural attitudes in accepting and implementing such policies as lockdowns; social distancing; and attitudes towards vaccinations. Cross-country studies have their merits in comparing the efficiency and the effectiveness of various policy interventions—this is not examined in this paper. In another paper, I have compared national health expenditures in the European Union and their effects on COVID-19 (Papanikos 2020c, 2020d).

This paper is organized as follows. The next section discusses the three Greek lockdowns implemented by the government as urgent measures to cope with the spread of the pandemic. The following section of the paper analyzes the number of daily deaths from COVID-19, taken into consideration the three lockdown periods. Thus, this section provides preliminary evidence on the effects of lockdowns on the number of daily deaths due to COVID-19. The fourth section looks at the effect of vaccinations (both the number of vaccinations and the number of people vaccinated) on daily deaths. The fifth section relates daily average weather temperatures to COVID-19 daily deaths. The final section concludes, including some ideas of the direction of future research.

Coping with the Pandemic: The Lockdown Days

The Greek government responded quickly to the pandemic and locked down the economy even before any death was reported (Figure 1). It also took a number of additional measures, but the most important ones were the partial closing down of the economy, the online provision of education (private and public) and the cancelling of all cultural, religious and sporting events. Practically what these measures aimed at was to restrict social interactions by requesting people to stay home; this was not entirely unique to Greece. With very few exceptions, many other countries in the world implemented exactly the same policies. There were additional measures such as communication policies to persuade the public to follow, on a voluntary basis, certain rules related to personal hygiene, wearing masks everywhere (it became mandatory during the last two lockdowns) and keep social distancing as often as possible. However, these are secondary measures because if someone is restricted at home, then personal hygiene and social distancing become irrelevant. These policies are not reviewed in this study.

In Greece, the lockdown of the economy begun on 11 of March 2020 (Table 1). Some of these measures are still in existence today; some have never been lifted,

e.g., attending sports and cultural events. However, for the purpose of this study, a distinction is made between a mild and a strong version of a lockdown. The demarcation line is whether primary and secondary schools were open or not. Thus, Figure 1 makes a distinction between restrictive lockdowns and not-so-restrictive lockdowns.

Figure 1. Days of Lockdown Due to COVID-19 from 26 Feb 2020 to 14 Jun 2021

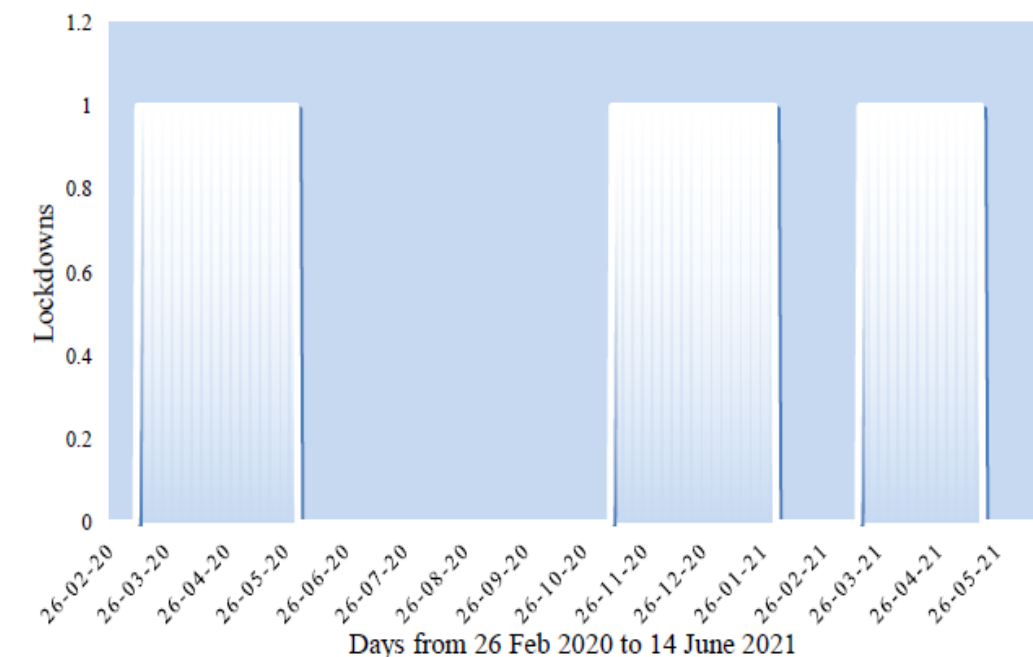


Figure 1 shows that during the period of the current pandemic, the Greek government had decided to close down the economy three times. Table 1 reports the starting and the ending days of each of the three lockdowns and their duration in days. The first lockdown started on 11 of March 2020 and lasted 82 days until the 31 of May 2020. The second lockdown was the longest; it lasted 84 days, starting on 9 of November 2020 and ended on 31 of January 2021. The last lockdown started on 16 of March 2021 and ended on 17 of May 2021, a duration of 63 days.

Table 1. Lockdowns

Lockdowns	First Day	Last Day	Duration in Days
1	11 March 2020	31 May 2020	82
2	9 November 2020	31 January 2021	84
3	16 March 2021	17 May 2021	63

Note: The dates were gathered from various Greek government announcements.

During this long period of 475 days, the economy was under a strict lockdown for almost half of the period, 229 days or 48% of the total days. The question is whether these three lockdowns had any positive effect in decreasing the number of deaths. An actual comparison is impossible because one should estimate what would have been the number of deaths without any lockdown. In addition, only

the short run (immediate) effects of lockdowns are examined. In the medium and long runs, the effects on the number of deaths might be different. The total number of deaths due to COVID-19 in Greece is examined in the following section.

Deaths from the Pandemic

There are many ways to measure the effects of COVID-19. The number of people infected is an obvious indicator, but, unfortunately, reliable data on this variable are not available. The reason is that there are many people who had been infected without any symptoms at all; this is truer for young people. These people went unnoticed and are not reported anywhere to be found. Thus, the number of people infected cannot be used as an indicator of the impact of COVID-19. A more accurate indicator is the number of people who died from the disease, but still this is a complicated index because many deaths may be attributed to COVID-19, even though these people died for other reasons as well; the so-called underlying medical conditions. In Greece most of the people who died from COVID-19 were otherwise too old and suffering from a chronic disease. Notwithstanding, this is a good indicator when the analysis is done for one particular country. When comparisons are made between countries then this indicator may not be appropriate because the total number of deaths due to COVID-19 are affected by the level of socioeconomic development. These countries are able to provide better (in quality and quantity terms) public and private health and hospital services.

In an earlier study (Papanikos 2020a), I found that social spending did matter. The higher the social spending as a share of GDP, the lower the ratio of deaths to population. It seems that social policy, which includes health spending, does reduce the death rate. Similarly, the size of population played a role. Population size had a non-linear impact on deaths due to COVID-19. Highly populated countries were hit harder by COVID-19, but the rate of the effect decreased as population size increased.

In this current study, these effects are not relevant because only one country is examined and consequently the total number of deaths is considered as the appropriate variable to use. Figures 2 and 3 depict (a) the daily number of deaths due to COVID-19 and (b) the accumulated number of deaths due to COVID-19 from the first day of the first case of an infected person reported on 26 February 2020. The first reported death was on 12 March 2020.

Figure 2. Daily Number of Deaths Due to COVID-19 from 26 Feb 2020 to 14 Jun 2021

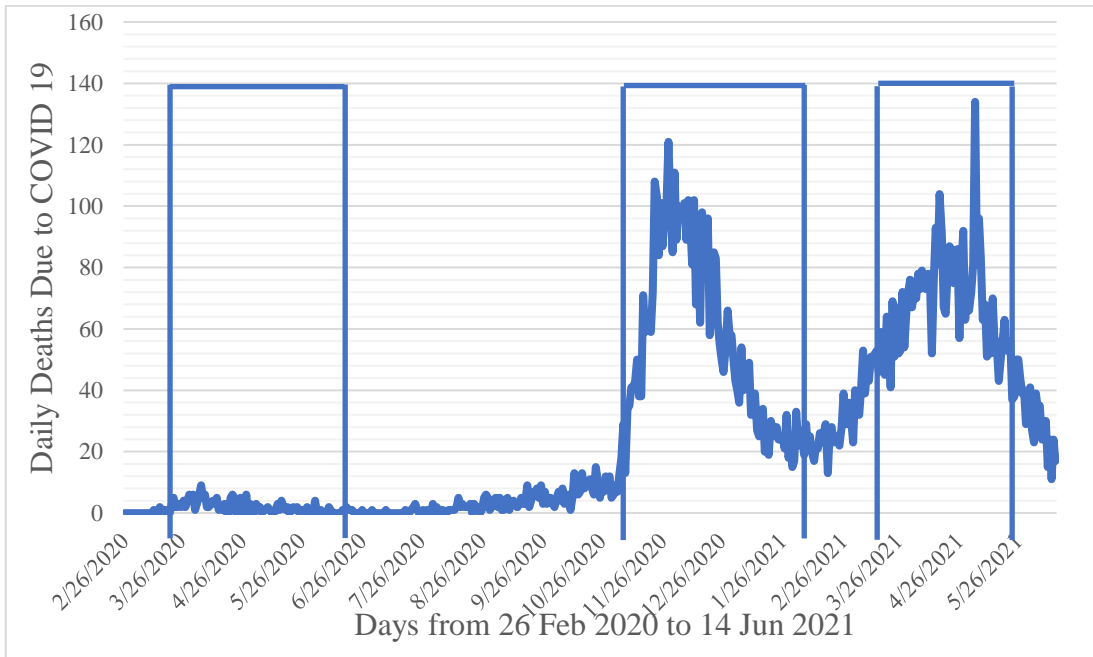
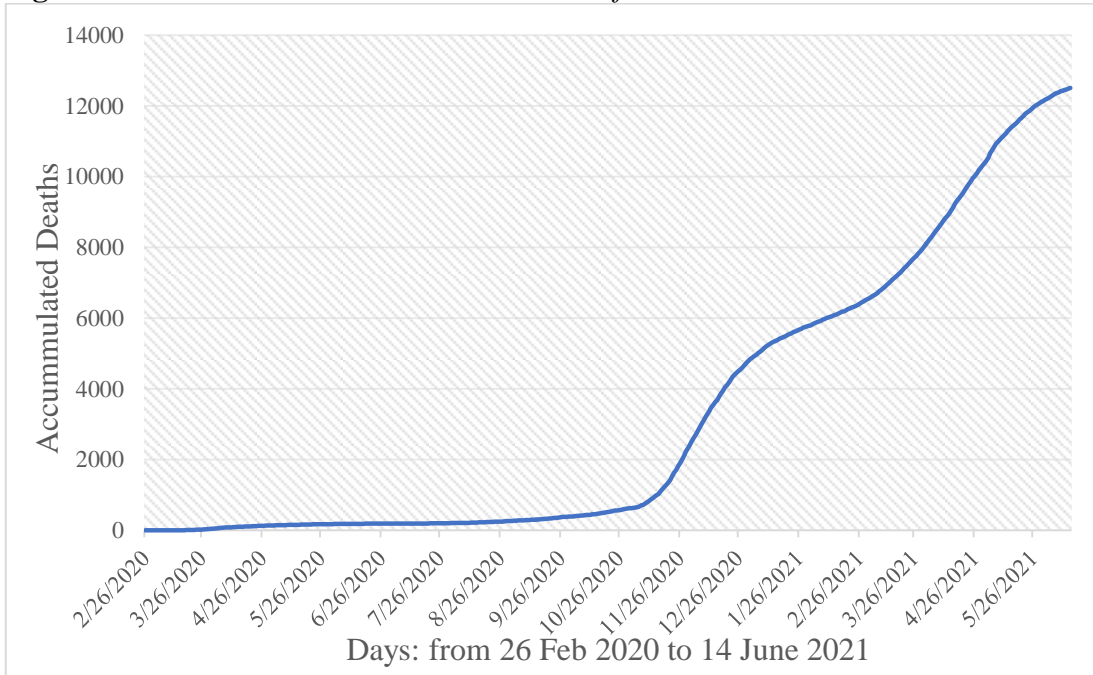


Figure 3. Accumulated Deaths Due to COVID-19 from 26 Feb 2020 to 14 Jun 2021



As already mentioned, the government locked down the economy the day before, on 11 of March 2020. During the 82 days of the first lockdown the average reported daily number of deaths was 2.1 people. At the end of the first lockdown the accumulated number of deaths had stabilized, i.e., the curve flattened out (Figure 3). The lockdown periods are embedded in Figure 2 as three orthogonal

parallelograms with the length of the base being determined by the number of days of its duration. The height does not indicate anything.

The government was forced to open up the economy because of the huge revenue loss from international tourism non-arrivals. The economy remained open throughout the tourism season from the beginning of May of 2020 until the first week of November of 2020. There were 187 days of no strict lockdown. During this period, the average daily number of deaths was only three. The government decided to lockdown the economy again for the second time for a duration of 84 days (Table 1) until the economy opened again on 31 January of 2021, but, pretty soon, a third lockdown was implemented on 16 March 2021 for 63 days. The economy opened up again for the 2021 tourism season. Figure 3 shows that the total (accumulated) number of deaths from COVID-19 on 14 of June 2021 was 12,503 people.

What were the effects of lockdowns on the daily number of deaths? Figure 2 shows that the first lockdown had a drastic effect of keeping the daily number of deaths very low indeed. This low number of deaths continued throughout the summer months even though the strict lockdown measures were lifted, but this might have been the effect of higher weather temperatures as shown in the fifth section of this paper.

By the end of October 2020, the total number of daily deaths was starting to rise again which alarmed the Greek authorities to enforce a second lockdown. In the beginning of the second lockdown, the number of deaths skyrocketed because of a lagged epidemiological effect. During the Christmas holiday period some measures were lifted, but the schools were closed because of the holidays. This might explain the spike in deaths in the third week of December 2020. After the holidays, the lockdown was working again. The daily death toll of COVID-19 decreased, but had never returned to its earlier period of the first lockdown.

There appears to be two explanations to account for this difference. Firstly, the government itself did not implement the lockdown with the same zeal as it did during the first lockdown. Secondly, people were really tired of being locked in. Unlike in the first lockdown, this time they did not demonstrate the same obedience and patience.

Things became worse during the third lockdown from 16 of March 2021 to 17 May 2021 (63 days in total). Comparing the two last lockdowns, some important differences are observed. Firstly, the average, the standard deviation and the maximum values of the number of deaths were higher in the third lockdown compared to the same numbers of the second lockdown. Secondly, it took a longer time for the effects of the third lockdown to show up. Thirdly, by the end of the third lockdown, the effect of vaccinations may have become operative as shown in the next section. Thus, with a scatter diagram the two effects cannot be separated. There is a need to develop a regression model to estimate the two separate effects. This is not undertaken in the current study.

An important issue is not only the total number of deaths, but their distribution over time. Table 2 tabulates the daily distribution of deaths in Greece during the period of the pandemic into 14 categories over ten days. This is important

information because it relates to peak load demand which is usually applied in energy demand, but applies to hospitalizations as well.

Table 2. *Tabulation of Daily Deaths from 26 Feb 2020 to 14 Jun 2021*

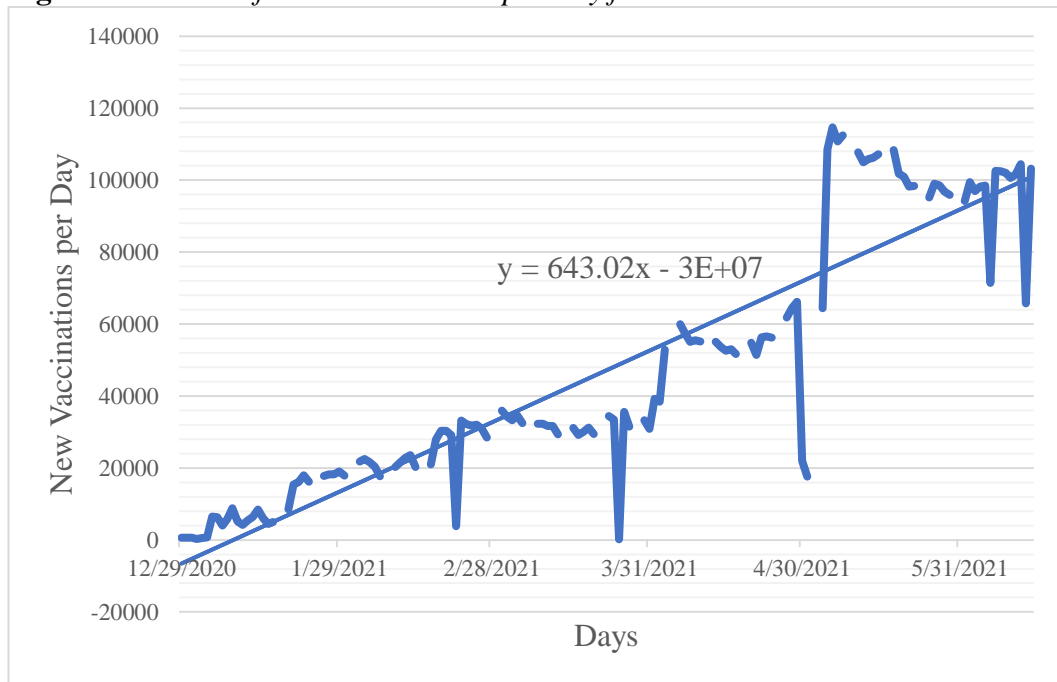
Value	Count	Percent	Cumulative Count	Cumulative Percent
[0, 10)	242	50.95	242	50.95
[10, 20)	23	4.84	265	55.79
[20, 30)	43	9.05	308	64.84
[30, 40)	27	5.68	335	70.53
[40, 50)	22	4.63	357	75.16
[50, 60)	34	7.16	391	82.32
[60, 70)	20	4.21	411	86.53
[70, 80)	23	4.84	434	91.37
[80, 90)	18	3.79	452	95.16
[90, 100)	11	2.32	463	97.47
[100, 110)	9	1.89	472	99.37
[110, 120)	1	0.21	473	99.58
[120, 130)	1	0.21	474	99.79
[130, 140)	1	0.21	475	100.00
Total	475	100.00	475	100.00

What is important here is not so much the average daily number of deaths, but their daily variations. Half of the first 475 days of the pandemic had less than 10 deaths per day which was easily handled by the Greek health and hospital sector. Not shown in the table are the values of the average of 26 deaths and the standard deviation of 31 deaths. It is the latter statistic that is of concern here. If the standard deviation was zero, the number of 26 deaths each day would be easily handled by the Greek hospital sector. Having more than 50 deaths per day was worrisome and put a lot of pressure on the health and hospital sector. This occurred 25% of the days of the pandemic period. This put a lot of strain on the hospital services and especially in the intensive care units of them.

Vaccinations and the Daily Number of Deaths Due to COVID-19

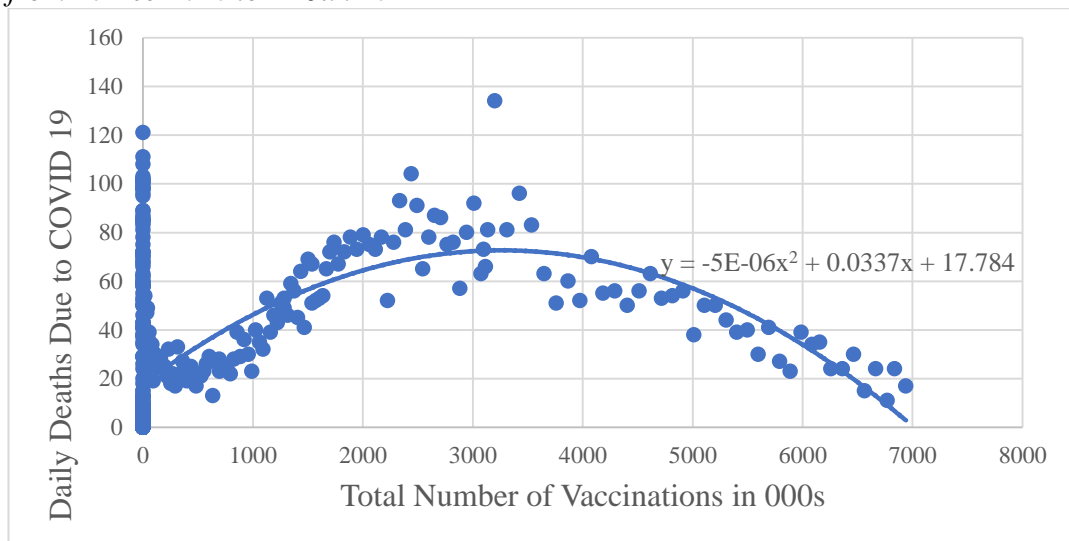
This section examines the effect of the total number of vaccinations and the total number of people vaccinated on the daily number of deaths (Figures 4, 5 and 6). As shown in the previous section, the Greek government did an outstanding job in implementing the first lockdown with excellent outcomes in terms of the daily number of deaths due to COVID-19. It did not perform as well in the second and the third lockdowns for the two reasons already mentioned.

Figure 4. Number of New Vaccinations per Day from 28 Dec 2020 to 14 Jun 2021



Note: This graph does not include the days with zero vaccinations to avoid cluttering.

Figure 5. Total Number of Vaccinations and Daily Deaths Due to COVID-19 from 26 Feb 2020 to 14 Jun 2021

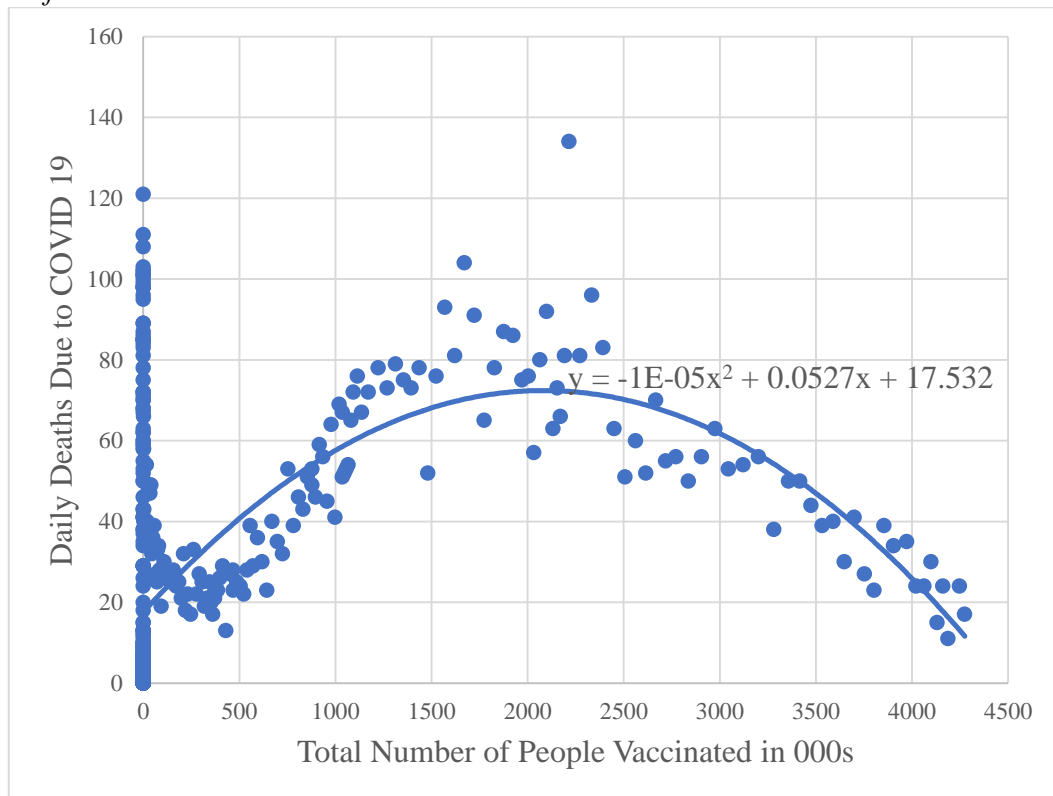


However, a new tool was discovered to be used by national policy makers to fight the pandemic. Prometheus stole the secret of vaccines held by the Olympians and started to distribute it to the world—not so equally as Prometheus himself would have liked it to have been, but, at least, it was available. The Greek government did an excellent job in organizing the vaccination program which had received many positive remarks from international media and other governments. Figure 4 shows the number of new vaccinations performed every day. The

vaccination program started on 28 of December 2020 when 447 people were vaccinated. This figure was over 100 thousand in the first days of June 2021. The steepness of the regression line of Figure 4 shows that vaccinations were increasing at a very high rate.

By the end of the period (14 June 2021), the total number of vaccinations were 6,938,959 and the total number of people vaccinated was 4,274,435. What was the effect on the number of deaths due to COVID-19? In this paper, simple correlations are used as these are shown in a scatter diagram. They do not imply causality, but this is easily inferred from epidemiology. In the first days after the vaccination, people are still vulnerable to catching the disease. If they relax their precautionary measures, then they increase their probability of being infected. At the aggregate (society's) level, this will show as an increase in the deaths due to COVID-19 among people who were recently vaccinated until a few weeks have passed, in order for people to develop the necessary antibodies to immunize from the disease—and still then, nobody is 100% protected. If this is the case, we might get a non-linear effect of vaccinations; a positive in the beginning and a strong negative thereafter.

Figure 6. Total Number of People Vaccinated and Daily Deaths Due to COVID-19 from 26 Feb 2020 to 14 Jun 2021



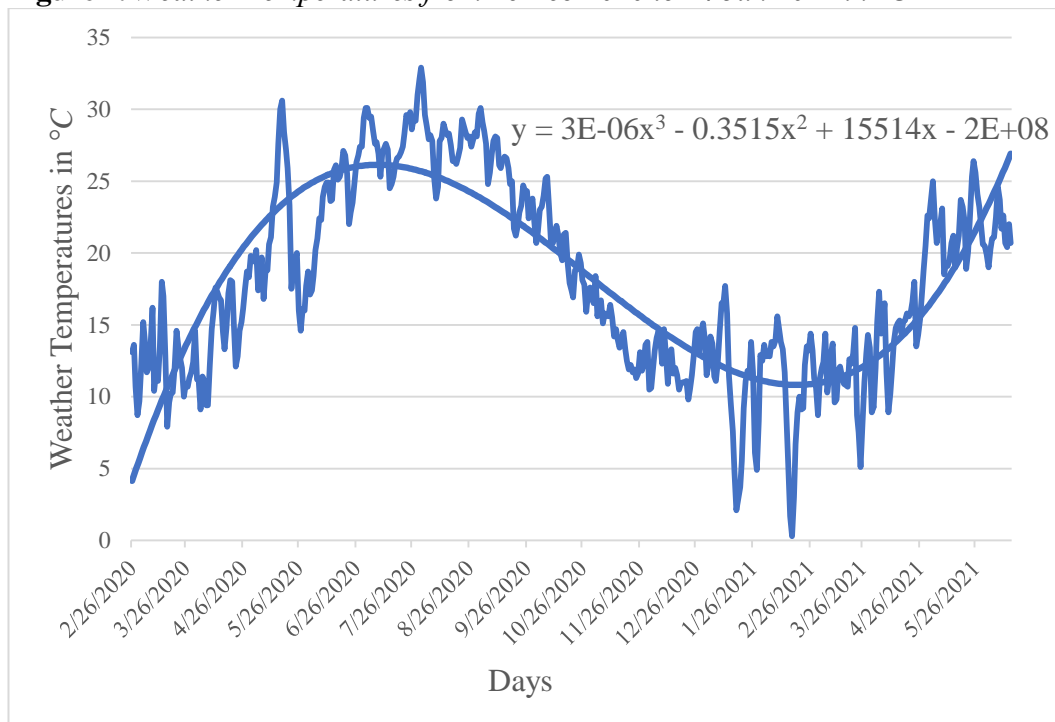
This evidence provides supportive evidence that vaccinations do work after a few weeks have passed. Thus, one expects that once a certain percentage of the population is vaccinated, then this might signal the end of the negative effect of the COVID-19 as measured by the daily number of deaths. This is exactly what many

national authorities are hoping around the world. Once they have vaccinated the larger proportion of their population the disease will be eradicated. This is exactly what Figures 5 and 6 show. It can be estimated from both equations reported in the two graphs that if more than six million people are vaccinated, then the estimated number of daily deaths will be zero. This, and good weather might be the answer to cope with COVID-19. The good weather effect is examined in the following section.

Temperature

The last variable to be discussed is the role of weather temperatures. In Greece there is a high annual variability of weather temperatures as shown in Figure 7 in °C. The variability can be very well approximated with a polynomial of third degree; the parameters of the equation are shown on the graph. However, there is great variability between the various regions of Greece, but here this paper has abstracted from regional differences in general; this can be the subject of another study. Instead, the average daily weather temperatures in the city of Athens were used as a crude indicator of the weather temperatures of Greece. Of course, it should be taken into account that almost half of the population of Greece is living in Athens and most of the daily deaths occurred in this city. In any case, one might safely assume that even though the average temperatures may differ between the different regions of Greece, their dispersion may be the same, and thus which area's temperature is used would not have affected the result.

Figure 7. *Weather Temperatures from 26 Feb 2020 to 14 Jun 2021 in °C*



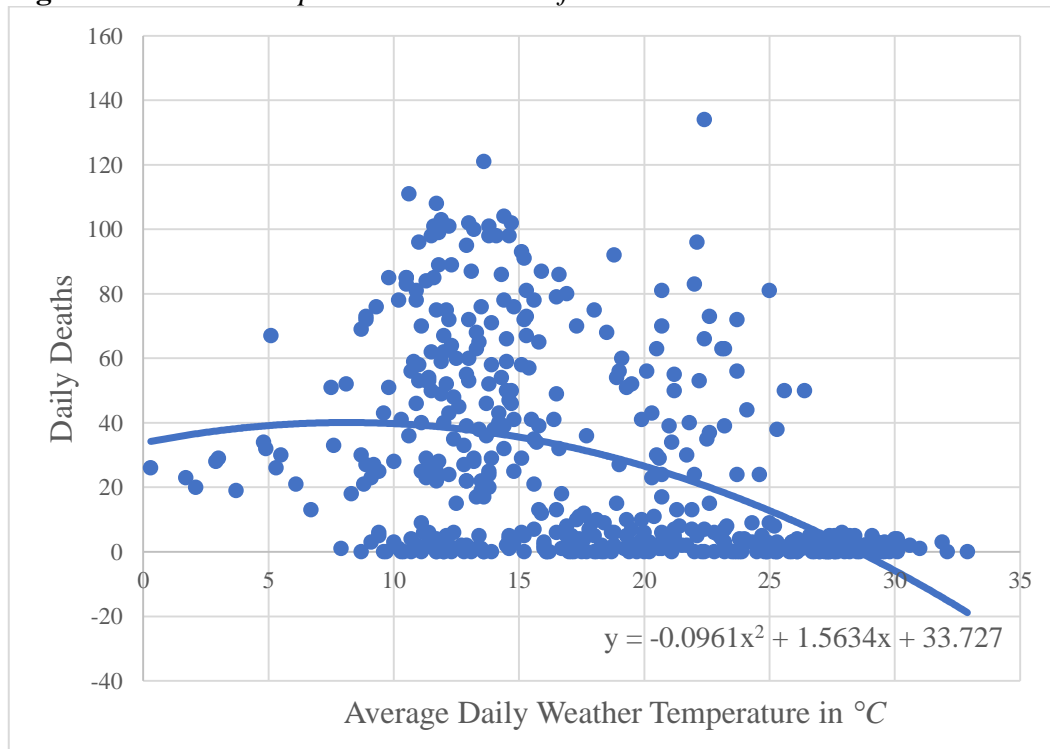
The average daily temperature during this period from 26 of February 2020 to 14 June of 2021 was 18°C. The maximum average value was 32.9 degrees occurring on 31 of July 2021 and the minimum was 0.3 occurring on 16 of February 2021. The standard deviation of the weather temperatures was 6.69°C.

Do weather temperatures affect the spread of the COVID-19 and therefore the number of deaths from it? Figure 8 shows the scatter diagram of the two variables. The linear effect (not shown in the graph) of temperature on the daily number of deaths is positive and actually very strong, but there are many dispersions.

A polynomial of second degree fits the relation better, and this is shown in Figure 2 along with the estimated parameters. In general, in the summer period, the number of deaths is reduced relative to the winter months. At relatively low average temperatures (below 15°C), the relationship is flat or slightly positive. In these temperatures there is no effect on the number of deaths.

For temperatures higher than 15°C, the number of deaths declines drastically, reaching almost zero for average temperatures above 25°C. It is also interesting to note that for low temperatures (less than 8°C), there was no day with zero deaths from COVID-19.

Figure 8. Weather Temperature and Deaths from COVID-19



Note: Data on weather temperatures were retrieved from: <http://www.meteoacharnes.gr/statistika/datasummary.htm>. [Accessed 15 June 2021]

Just as a demonstration from the second-degree polynomial, it can be calculated that for a temperature of 0°C, the daily number of deaths is equal to 34 deaths. At the average of 18°C, the daily number of deaths implied from the equation is 31 people. Solving the equation for zero deaths, a temperature of

28.5°C is sufficient. This exact temperature occurred three times in this period: 5 July 2020, 13 August 2020 and 3 September 2020. In the first, the number of deaths was zero, but in the other two cases the number of deaths were 2 per each day. It is important to repeat that the data of weather temperatures used in this study are from Athens, which are different from the rest of the country (usually lower). Even the Athens' data are the average of the day. Another weather temperature indicator would have been the standard deviations of the daily weather temperatures.

The correlation coefficient of the daily number of deaths and the average daily weather temperatures was -0.428, implying a negative relationship. When temperatures increase, the number of deaths from COVID-19 decrease.

One may conclude from this descriptive evidence that weather temperatures did affect the daily number of deaths from COVID-19. The explanation given is that warm weather allows outdoor activities which reduce the spread of the disease.

Conclusion

The descriptive evidence shows that during lockdowns the number of deaths from COVID-19 does decrease after a certain time period, reversing an initial upward trend. From the three lockdowns, this was the case in the last two lockdowns. The first lockdown was implemented early on when the number of deaths was zero and therefore it had an immediate effect in preventing the number of deaths from rising.

The second conclusion relates to the total number of vaccinations and the total number of people vaccinated. The latter figure is lower because, with the exception of one vaccine, all others require two doses. Thus, the first figure includes people who have been vaccinated twice. The descriptive statistical evidence shows that initially the association between vaccinations and number of deaths was positive, but it quickly turned into a strong negative, indicating that vaccinations do work.

The last conclusion relates to weather temperature. The hypothesis that high weather temperatures reduce the infections and therefore the deaths from COVID-19 is not falsified. At zero °C, the daily number of deaths was found equal to 34 deaths. As temperatures increase, the number of deaths decreases. At 28.5°C, the number of deaths was found to be equal to zero. Thus, an increase in vaccinations and temperatures are expected to eliminate the number of deaths from COVID-19 in Greece during the summer months of 2021.

The descriptive statistics presented in this paper by no means imply causality. Once this pandemic has done its cycle and more data become available, particularly on vaccinations, then a statistical model may explain and quantify the effects of the lockdowns, vaccinations and weather temperatures on the daily total number of deaths from COVID-19.

However, there appears to be some statistical problems which require attention. Firstly, it seems that the integration properties of the variables are not the same. Deaths is a variable which is integrated of order one while the other variables do not have the same level of integration. Thus, first differentiating might be an appropriate model. Secondly, the lagged effects should be determined

because according to epidemiologists, measures, such as lockdowns and vaccinations, reduce deaths only after a long (in days) period has passed. These are important issues and a future research should account for them.

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The Impact of COVID-19 Epidemic on Immunization Activities in Italy

Patrizia Parodi, Francesco Maraglino & Anna Caraglia

COVID-19 has led to disruption in routine immunization programs around the globe. In Italy, we assessed the impact of COVID-19 epidemic on immunization activities using a questionnaire to explore reasons for decrease in vaccination and measures implemented. Sixteen Regional Health Services over 21 answered (76.1%). A decrease in immunization activities was mostly recorded after the notification of the first local cases in Italy and during the peak of the epidemic. About one-fourth (28%) of immunization centres suspended their activities and more than 33% of health workers in immunization centres were shifted to the COVID-19 response. Specific training on COVID-19 was generally reported. Children above 1 year of age until adolescence were the most affected by disruption of immunization services followed by adults indicating that primary series vaccination were prioritized. Several measures were implemented, such as immunization only under appointment, give priority to some immunization/subjects and extend the hours of work to avoid overcrowding; telephone call to families; developing a list of children who have missed their vaccine doses; preparing a targeted action plan to ensure rapid catch up of children who are not up to date with their vaccination. Information and awareness raising activities were also indicated, even if in a lesser extent. The results of the survey were used to collect and disseminate best practices in order to minimizing the effect of the pandemic on vaccine preventable diseases.

Keywords: *COVID-19, routine immunization, immunization catch-up activities, vaccination services, Italy*

Introduction

Epidemiology of COVID-19 in Italy

Since the first reported cases in China in December 2019 and until 29 January 2020, in Italy the infection with SARS-CoV-2 was not detected. On 30 January, the same day in which the World Health Organization declared the new coronavirus epidemic a public health emergency of international concern, two imported cases were confirmed in Latium Region. The day after, the Italian Government declared the national emergency in response to COVID-19 epidemic. On 21 February, the first local case was registered in Lombardy Region. In the following weeks, the infection spread all over Italy despite the timely implementation of public health measures. The peak of new cases was reached on 21 March, followed by a slow and irregular decrease until the current transition phase characterized by a more stable number of daily reported cases and no overburden of health services.

Some regions, in particular Lombardy, Veneto, Emilia-Romagna and Piedmont were affected earlier and more severely by the epidemic especially during the early phases. Shortage of health workers was a common key problem.

COVID-19 emergency had a strong impact on people and the national health system. Public health measures focused on stay at home policies, social distancing, closure on non-essential services, including schools, until complete lock down, to reduce the spread of SARS-CoV-2. Limiting movement outside the home to essential activities could have influenced the decision to postpone immunization. In few weeks, the number of hospital beds, both in intensive care unit and in medicine wards sharply increased, with *ad hoc* facilities dedicated to the care of COVID-19 patients. Part of the healthcare resources have been shifted to the COVID-19 response, with a presumable impact on the routine immunization activities.

The immunization services are an essential part of the national health system and the Ministry of Health issued guidance to maintain their operation as far as possible. Nevertheless, disruption of immunization activities during COVID-19 pandemic was reported in literature and we decided to evaluate the situation in Italy.

Immunization Activities in Italy

Immunization activities are a core component of the public healthcare assistance: the Italian immunization policy applies across the life-course, with ten mandatory routine immunization for children aged 0–16 years and unaccompanied foreign children: polio, diphtheria, tetanus, hepatitis B, pertussis, *Haemophilus influenzae* type b, measles, rubella; mumps, varicella, chickenpox. In teenagers, further recommended vaccinations include anti HPV and *meningococcus*, while in the elderly over 65 years, influenza, herpes zoster and pneumococcus immunization are recommended. Generally, vaccination is offered free of charge by the public immunization services, including general physicians and paediatricians. Seasonal influenza vaccine can also be administered in pharmacies.

Italy is endemic both for measles and for rubella, with large outbreaks occurring in the last years.

Literature Review

The World Health Organization (WHO 2020, WHO EURO 2020, WHO and UNICEF 2020) issued guidance on routine immunization services during COVID-19 pandemic, warning about the risk of vaccine preventable disease outbreaks due to the disruption of immunization services, even for limited period of time, which could cause further pressure on health services. During COVID-19 pandemic, it is critical to ensure trust of the population in the health system guaranteeing that activities are performed under safe conditions, implementing optimal infection prevention measures during immunization sessions and adequate observation of adverse events following immunization (AEFIs). Primary series vaccination and other vaccination for vulnerable groups should be prioritized. Communication plays an important role and should clearly explain the benefit of vaccination even during a health emergency to address community reluctance. WHO recommends

resuming and restoring immunization services as soon as possible when SARS-CoV-2 transmission decreases to close immunity gaps created during the epidemic.

In the Americas, the Pan American Health Organization (PAHO) (2020) conducted a survey in 38 countries and territories of the region to monitor the functioning of immunization services and the main challenges during COVID-19 pandemic. After lessening the lockdown measures, immunization activities resumed, but the demand remained low due to people's concern about the risk of exposure in healthcare settings, restraint in public transport and other public health measures. Several innovative strategies were implemented by countries such as drive-through vaccination, mobile vaccination centres, vaccination in homes, vaccination with prior appointment, vaccination in strategic locations, and communication strategies. Difficulties were recorded in several countries in delivery of vaccines and other supplies and in maintaining epidemiological surveillance due to laboratory services shifted to COVID-19 testing.

Hungerford and Cunliffe (2020) welcomed the launch of the European Vaccination Information Portal in conjunction with the European Immunization Week 2020, as it is important to ensure sufficient resources and priority to delivery of routine immunization especially in COVID-19 time. In fact, preventive measures, such as lock down, quarantine and social distancing represent a big challenge for delivering immunization. To mitigate COVID-19 effects, it is important to monitor immunisation rates at all levels.

Santoli et al. (2020) examined two data sources to assess the impact of the pandemic on paediatric immunization in the United States. The first is the cumulative doses of vaccines ordered by healthcare providers. The second is the aggregate counts of measles-containing vaccine doses administered between two paediatric age groups: children aged ≤ 24 months and children aged >24 months through 18 years. Both data sources compared the same period of 2019 and 2020. The authors found a considerable decline both in orders and in administered doses, starting the week after the national emergency declaration. Children ≤ 24 months were less affected by the decrease in immunization. According to their study, parental concern about possible exposure during vaccine session might contribute to the drop registered.

Another study conducted in Michigan (Bramer et al. 2020) found that vaccination coverage decreased in all age cohorts except for birth-dose hepatitis B coverage, which is generally administered in the hospital setting. Compared to 2019, the 16-months age cohort suffered a decline of 5.2% in 2020, while children aged 5 months experienced a decrease of about 17% of all recommended vaccines. They called for concrete efforts to ensure a quick catch-up for children that missed their scheduled vaccination.

In Canada, a life-course vaccination policy applies, in line with WHO recommendations (WHO 2019). In this country, Mac Donald (Mac Donald et al. 2020) reported a disruption in routine immunization programs due to COVID-19 and identified three components to improve catch-up: find who has been missed; detect delivery gaps and develop tailored strategies for catch-up; and communicate, evaluate and adjust programs taking into account the evolving situation.

According to Adamu et al. (2020), COVID-19 disrupted routine immunization services for children and this is of particular concern because coverages in many African countries are suboptimal. The authors reported that it was demonstrated by scientists that the benefit of routine immunization in Africa is greater than the risk of COVID-19 death that could result from attending a vaccine session. They suggest affording the immunization system as a whole because all components are interdependent. In addition, they warn against the effect of preventive measures adopted for combating COVID-19 on poverty, because these actions can widen socioeconomic inequalities with implication on immunization coverage. Also in this context, information plays a key role to combat misinformation and contrast vaccine hesitancy.

Despite concerns have been raised on the effects of COVID-19 on routine children immunization, also older adult immunization is at risk, as described in the study of Privor-Dumm et al. (2020). In particular, they support the need to build a global system for both routine and pandemic/epidemic older adult immunization. Several vaccines against other pathogens, such as influenza, pneumococcus and herpes zoster, can keep adults in good health conditions and prevent co-infection with COVID-19. They call for a wide communication initiative focused on the importance of older adult immunization, as recommended in the Immunization Agenda 2030. In addition, they recommend integrating older adult immunization with other country priorities, including emergency preparedness plans for infectious threats. The authors underline the opportunity that the new COVID-19 vaccines will represent for exploring innovative strategies in delivery immunization to older adults to avoid potential risks such as the need to travel to reach the vaccination centre or spend time in waiting rooms.

Methodology

We conducted a survey from 28 May to 9 July 2020 using a questionnaire to understand the impact of COVID-19 on immunization activities and measures implemented at local level, in order to identify best practices to share at national level. The tool was organized in five sections respectively on general data; effects of COVID-19 emergency on vaccinations; organization measures; reactive activities and vaccine supply. We mostly used pre-defined multiple or single choice answers, with the possibility to add comments, in order to catch up further information. The specific aims of the survey were to explore:

- immunization decrease due to the suspension of activities and to staff reduction or reallocation due to COVID-19 emergency;
- specific training of staff on COVID-19;
- the period of highest disruption of immunization services;
- the most affected age and type of vaccination;
- the organization and contrast measures implemented at local level;
- the impact of COVID-19 on vaccine supply and use of doses.

Due to the semi-federal Health System in Italy, the Ministry of Health transmitted the questionnaire to the Regional Health Services, which collected information from the Local Health Agencies (LHAs) belonging to their territory. Then, the Regional Health Services sent the compiled questionnaires back to the Ministry of Health. As the number of LHAs for each Region varies according to the organization model, this factor can have partially biased the results.

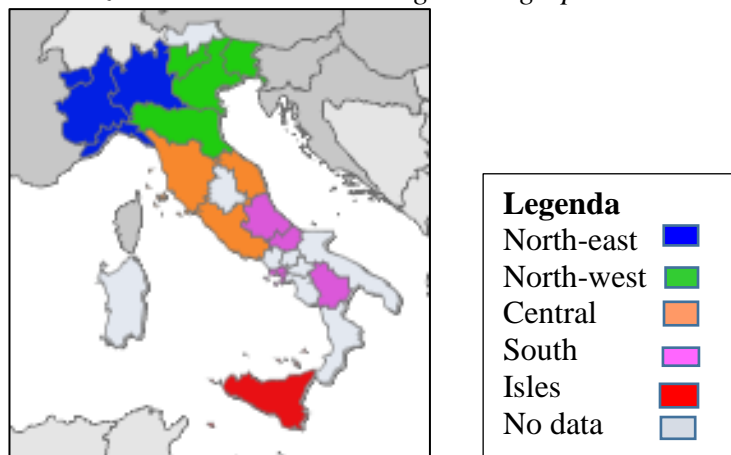
We analysed data, using MS Excel tools. All the variables included in the survey were described using the appropriate statistics: categorical variables were described with proportion and percentages, while ordinal variables using the mean value. In addition, we made a semi-quantitative analysis of comments, to complement the information.

Data were investigated at national level, and for geographic area according to the National Institute of Statistic classification: North-west (Piedmont, Aosta Valley, Liguria, Lombardy); North-east (Trento, Bolzano, Veneto, Friuli Venezia Giulia, Emilia Romagna), Central (Marches, Tuscany, Umbria, Latium), South (Campania, Abruzzo, Molise, Apulia, Basilicata, Calabria) and Isles (Sardinia, Sicily).

Results

Overall, 16 Regions over 21 answered (76.1%) (Figure 1): in total we collected 97 questionnaires from LHAs.

Figure 1. Italian Regions Participating in the Survey on Impact of COVID-19 on Immunization Activities according to Geographic Area



Decrease of Immunization Activities

Almost all LHAs (94/97 = 96.9%) affirmed that immunization activities have decreased during COVID-19 emergency, compared to the same period of the previous year.

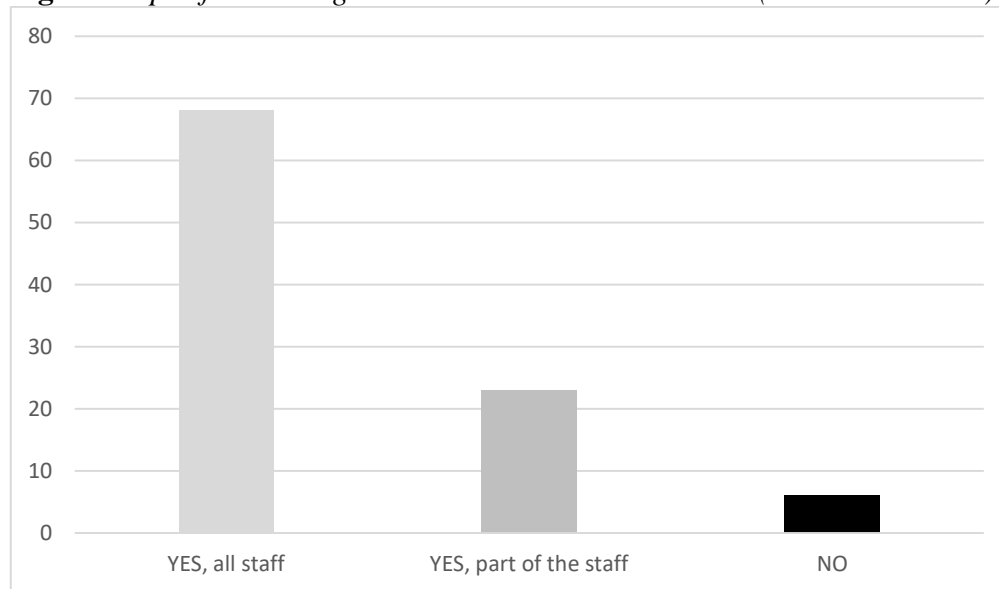
At national level, about one-fourth (28%) of immunization centres suspended their activities: the closing period, when reported, was limited in time, maximum

17 days. In Lombardy, the number of immunization centres that suspended the activities due to COVID-19 was higher (more than 50%) while it was lower in the Isles (about 11%). The shifting of the health workers to the COVID-19 response from the immunization centres (more than 33% at national level) concerned all professional categories, including physicians, nurses, administrative staff, but mostly the health assistants (more than half of those on duty). About 5.5% of staff working in the immunization centres was infected by SARS-CoV-2.

Specific Training on COVID-19

As shown in Figure 2, the great majority of answers (91/97 = 93.8%) affirms that the staff of the immunization centres received a specific training on COVID-19. This training generally concerned the whole staff (n=68; 70.1%) or only part of the staff (n=23; 23.8%). It must be underlined that about 6% of answers were negative, showing the need to continue and complete training activities.

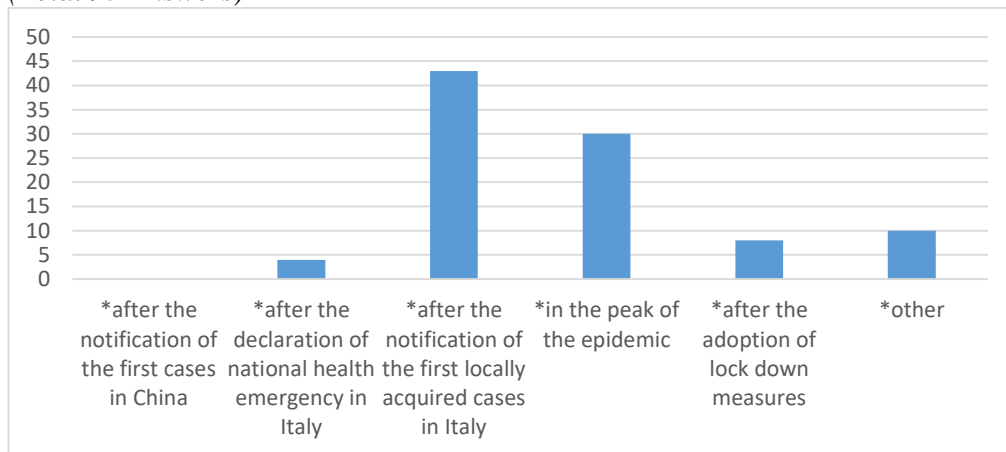
Figure 2. *Specific Training on COVID-19 at National Level (Total 97 Answers)*



Period of Highest Disruption

A decrease in immunization was mostly recorded after the notification of the first local cases in Italy and during the peak of the epidemic (Figure 3). The lockdown measures implemented at national level, adopted on 22 March 2020, seem to have had a less relevant impact on routine immunization. In the questionnaires collected in the South, the decrease of immunization activities was noted earlier, especially after the declaration of national health emergency on 31 January 2020.

Figure 3. Stage of COVID-19 Epidemic Most Affecting Immunization Activities (Total 95 Answers)



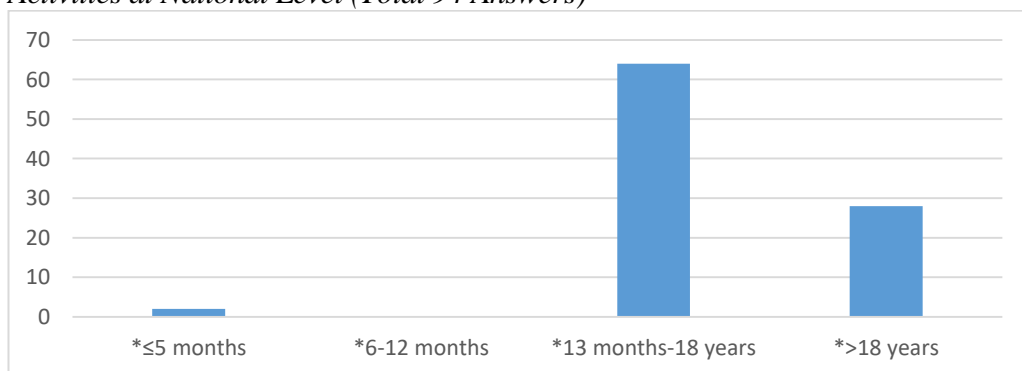
Most Affected Ages and Type of Vaccine

We recorded 94 answers on this topic, whose results are shown in Figure 4. At national level, children above 1 year of age until adolescence are the most affected by disruption of immunization services (n=64/94; 68%) and, less frequently, adults (n=28/94; 29.8%). Only 2 times children <1 year were mentioned. This result is confirmed by the analysis of open comments, indicating that primary immunization cycles, pregnant women, at risk people, and urgent immunization (for bites, accidents, etc.) were prioritised.

The results show some geographic differences: in the North-east the impact is higher in the adult population, while in the Central, South and Isles areas the impact is almost entirely on children aged 1 year or more.

With respect to vaccines, at national level anti-HPV was mentioned as the most affected, followed by Herpes Zoster, DTPa and meningococcal B. The decrease in other antigens was reported a very limited number of times. In the North-west area, a relevant reduction of polio (IPV) immunization was referred while in the Central area both IPV and measles, rubella, mumps (MPR) immunizations.

Figure 4. Classes of Age Experiencing the Highest Reduction in Immunization Activities at National Level (Total 94 Answers)



Organization and Public Health Measures

Almost all answers (n=95/97; 98%) show that some extra organization measures during COVID-19 emergency were implemented, most generally consisting in: immunization only under appointment, give priority to some immunization/subjects and extend the hours of work to avoid overcrowding. A limited number of answers indicated other organization models. Home vaccination and mobile vaccination posts were never mentioned.

To contrast the disruption of immunization, the measures more frequently reported were: telephone call to families; developing a list of children who have missed their vaccine doses; preparing a targeted action plan to ensure rapid catch up of children who are not up to date with their vaccination. Information and awareness raising activities were also indicated, even if in a lesser extent, while the following measures were rarely described: targeted action plan for at risk categories and strengthening vaccine preventable disease (VPD) surveillance. Information and awareness raising activities seem to be particularly implemented in the South area, where they rank first among the countermeasures.

The analysis on comments regarding organization measures indicates that the health staff optimized all available spaces also through active research of new vaccination sites in order to avoid overcrowding, guarantee social distancing, implement safety measures to minimize risk of infection, prolonged opening hours, controlled and limited entry or only upon advanced scheduling, telephone triage. In addition, they focused their efforts in contacting families both before vaccination and in case of missed vaccination to re-programming of scheduled appointments with active call, and in strengthening collaboration with paediatricians.

Impact on Vaccine Supply and Use of Doses

Supply shortage was very rarely mentioned (n=3/97; 3%), while an increase of wasted doses was reported in about one third of respondents (36%), with highest values in Lombardy (60%) and in the North-east area (47.6%) and minimum values in the Isles (0%) and in the North-west area (5.5%).

Discussion

In Italy, we implement a life-course policy of immunization, with most of vaccinations offered for free by public health services. In addition, some vaccinations, especially those for preventing outbreak-prone VPDs, are mandatory for accessing schools.

As recommended by WHO, during the epidemic primary series vaccinations were prioritized in the whole country, reducing the risk of VPD outbreaks, due to an accumulation of susceptible persons, the same finding reported by Santoli (Santoli et al. 2020) in her survey in the United States. According to the surveillance data collected by the European Centre for Disease Prevention and Control (ECDC), the reported cases of measles in the first trimester of 2020 in

Italy were 102 compared to 581 in the same period of 2019. This reduction in the number of notified measles cases during COVID-19 seems to suggest a lack of major gaps of immunization in outbreak-prone VPDs coupled with a reduced risk of spread due to social distancing measures, stay at home and lock down policies. In Italy, schools were closed in the early phase of SARS-CoV-2 epidemic, replaced by on-line teaching activities. Schools are recognised as common setting for the spread of outbreak-prone VPDs.

It is important to note that for other antigens, such as HPV, the impact was worse. In this case, catch-up activities could be easier to manage, as the vaccination, both for females and males, can be done from 11 until 14 years and over, depending on the type and schedule of the vaccine. In addition, the Italian vaccination plan recommends its use also in women of 25 years of age, at the moment of the first PAP-test.

Older people are those most seriously affected by COVID-19 in terms of morbidity and mortality, and several VPDs, including influenza, pneumococcal disease and herpes zoster represent a significant concern, and programs to deliver these immunizations are more urgent than before and should be prioritized, as reported by Privor-Dumm et al. (2020). In Italy, anti-herpes zoster vaccination was reported as the second most reduced. This can be due to the fact that older people were strongly recommended by the Government to stay at home since the beginning of the national epidemic. Considering the coming influenza season, special efforts should be put in communication strategies to encourage a wide adhesion to seasonal influenza vaccination in older adults, and to take this opportunity to propose other immunizations.

In our study, we found that the disruption of immunization services was reduced by the prompt adoption of organization and response measures at local and regional level. Almost all respondents reported more than one measure, including pre-scheduled in person appointments for vaccination and extend the hours of work to avoid overcrowding; telephone call to families; developing a list of children who have missed their vaccine doses; preparing a targeted action plan to ensure rapid catch up of children who are not up to date with their vaccination; and in strengthening collaboration with paediatricians. These findings are in line with recommendations from international organizations (WHO 2020, WHO EURO 2020, WHO and UNICEF 2020) and with reports from other countries (PAHO 2020, Brammer et al. 2020, MacDonald et al. 2020).

Our study suggests that the number of health workers in vaccination centres during COVID-19 pandemic was reduced in many cases: on the other side, they needed to develop and implement new strategies to cope with the new reality, with extra efforts to ensure that safety protocols were respected and to address the concerns of families. Their wellbeing should be monitored to avoid risks of burnout.

To ensure the highest level of safety during immunization activities, the Ministry of Health recommended to:

- prioritize on-line schedule, using the dedicated regional telephone lines (Regional Centre of Reservation), the affiliated pharmacies or the website

- of the health facilities, with priority given to children for mandatory vaccinations and to people at higher risk;
- permit entry into the waiting rooms only to one accompany person for each child, non-self-sufficient or fragile persons, and for persons with cultural-linguistic difficulties;
- remain in the facility under observation for AEFIs at least for 15 minutes, according to Italian guidelines;
- activate effective logistic measures in order to guarantee social distancing especially in case of free or mixed access to vaccination services;
- take body temperature and check respiratory symptoms before entrance;
- ensure procedures for hand hygiene (alcohol-based hand sanitizer, poster with clear indication of hygienic services, poster displaying how to wash hands);
- use of masks in people above 6 years of age;
- applicate appropriate measure for the safety of health workers;
- define effective protocols for cleaning and disinfection of environment with special attention to ventilation of premises;
- implement specific training on COVID-19 for all staff, irrespective of their role and profession.

Information and awareness raising activities were also reported in Italy, even if in a lesser extent. As mentioned in several studies, correct and widespread information of parents regarding the continued need for vaccination during COVID-19 and its safety, plays a key role in reducing immunization gaps both for routine childhood and adult immunization. Despite its recognised importance, social communication initiatives were jeopardized, therefore the Ministry of Health advised to reinforce these activities with a focus on:

- informing clearly on the need to vaccinate also during COVID-19 emergency to keep people in good health, and describing what organization changes were introduced;
- stressing the safety and preventive measures adopted to avoid SARS-CoV-2 transmission.

Especially during COVID-19 time, it was recommended to use the increased opportunities to contact families to re-schedule missed vaccinations and recall for outreaching. Communication activities at local level can be implemented in collaboration with other public administrations and stakeholders, with targeted initiatives for marginalised groups.

The vaccination schedule can be applied with some flexibility, adopting the more appropriate protocol according to the current scientific evidence, to facilitate catch-up.

Another recommendation concerned the need to have an updated analysis of staff requirements, taking into consideration its reinforcement, whenever possible, and introducing new organization models, aiming at developing the professional autonomy of non-medical staff in the management of immunization sessions.

Collaboration with general practitioners and paediatrician should be strengthened through specific agreements based on the local situations.

To broaden the possibilities of vaccination, it could be useful to find new spaces, guaranteeing the application of safety and preventive measures, also using, whenever possible, mobile immunization services and immunization at home.

Conclusion

COVID-19 had a nationwide impact on immunization services, despite some regions were much more challenged by the epidemic. Italy was the first and one of the most affected countries in the European Union to be affected by COVID-19. In our study, we found that immunization activities decreased during COVID-19 emergency, compared to the same period of the previous year, and this is in line with finding of other studies all over the world.

During the most acute phase of the epidemic, more than one fourth of the centres suspended their activities, also if for a limited period of time, being the maximum reported value 17 days. Disruption of immunization services was worsened by the shifting of healthcare workers to the COVID-19 response, which affected about one third of the staff, irrespective of their profession.

Both national and local level developed training activities for COVID-19: the possibility to access on-line fostered participation as shown by more than 90% positive response. Nevertheless, further efforts are required to let no staff without appropriate training, as this is a key element to protect the health of patients as well as of healthcare workers.

The decrease of immunization activities was observed at different times in different areas. While in general it was noted mostly after the notification of the first local cases and during the peak of the epidemic when social distancing and stay at home policies were implemented, in the South it was perceived earlier especially after the declaration of national health emergency.

At national level, children above 1 year of age until adolescence were the most affected by disruption of immunization services (n=64/94; 68%) and, less frequently, adults (n=28/94; 29.8%). With respect to vaccines, at national level anti-HPV was mentioned as the most affected, followed by Herpes Zoster, DTPa and meningococcal B.

In our study, we found that the disruption of immunization services was reduced by the prompt adoption of organization and response measures at local and regional level, most generally consisting in: immunization only under appointment, give priority to some immunization/subjects and extend the hours of work to avoid overcrowding. On the contrary, supply shortage was generally not observed.

Based on the results of the survey, the Ministry of Health disseminated best practices for effective catch-up in Italy, considering the epidemiological situation still diversified at local level and the regional organization of health services. At present lockdown policies have declined and relaxed and the supply of vaccination services can resume in full.

The Italian Government approved adequate legislative measure to strengthening primary health care, allocating more resources and improving coordination and integration with other actors, such as general practitioners and paediatricians in the case of immunization activities. Further opportunities for innovation could be explored when one or more COVID-19 vaccines will be available.

Acknowledgments

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A Study of Paediatric Supracondylar Fractures of the Humerus Presented during the COVID-19 Pandemic

Faaiz Ali Shah, Mian Amjad Ali, Naeemullah & Muhammad Bilal

Supracondylar fracture of the humerus is one of the most common fractures in children. The purpose of our study was to analyze the temporal variations and mechanisms of paediatric supracondylar fractures presented to our hospital during the COVID-19 pandemic lockdown period. As the schools and parks were closed and children were confined to their homes, they were thus more prone to injuries while playing inside. We claim that this would be the first study in Pakistan to provide unique information about these fractures. We conducted this descriptive study in the Accident and Emergency Department at Lady Reading Hospital in Peshawar, Pakistan from 18th March 2020 to 18th June 2020. In the enrolled children data regarding day and time of fracture occurrence, mechanism of fracture, height of furniture or play equipment from which the children fall and types of landing surfaces were all noted. Important variables were compared and a Chi-square test was applied to calculate P value ($P < 0.05$ was considered significant). The total number of children in our study was 160 with a mean age of 5.3 ± 1.3 years. The most common mechanism of fracture was fall from furniture (63.1%, $n=101$) and the landing surface was cemented or tiled floor in the majority (84.1%, $n=101$) of children. Maximum (40.6%, $n=65$) number of fractures were reported in the month of April and on a Monday (23.7%, $n=38$). Most (65.6%, $n=105$) children sustained fractures in PM time. The peak time of occurrence of fracture was 1700 h. We concluded that the majority of children sustained fractures due to a fall from furniture landing on hard cemented or tiled surfaces. Maximum number of fractures was reported in the month of April and on a Monday. Most of these injuries occurred in the evening and were operated on at night. The increased frequency of paediatric supracondylar fractures in the COVID-19 pandemic supports that preventative strategies should focus more on adult supervision, prevention of falls from furniture and provision of softer landing surfaces to lessen the impact of injury.

Keywords: *fracture, gartland, humerus, paediatric, supracondylar, surface resilience, temporal variations, weekday*

Introduction

Paediatric supracondylar humerus fractures are the most common elbow fractures and account for 12 to 17% of all bone fractures in children (Mangwani et al. 2006, Mulpuri et al. 2012, Wareham et al. 2003). Male children in their first decade, particularly between 5 to 8 years of age with left-side involvement are the typical representation of supracondylar humerus fractures (Della-Giustina and Della-Giustina 1999, Marquis et al. 2008). Managing these fractures is costly because they often require admission to hospital and surgical intervention (Loder et al. 2012). Displaced supracondylar fractures are treated with close reduction and

percutaneous pinning (CRPP) under an image intensifier (Mulpuri et al. 2012, Omid et al. 2008, Woratanarat et al. 2012). Open reduction and pinning is utilized when the fracture is open, with an associated vascular injury or the closed method is failed (Mulpuri et al. 2012, Omid et al. 2008, Woratanarat et al. 2012, Babal et al. 2010). Although variations in the demographic characteristics such as age, gender and side of supracondylar fractures have been reported by many studies, the temporal characteristics (month of injury, day of the week and hour of the day) of this fracture, particularly in our region, has not yet been studied (Loder et al. 2012, Babal et al. 2010, McRae and Nusem 2018). The first two confirmed deaths due to COVID-19 occurred in Pakistan on 18th March 2020 and both the patients were admitted in our hospital, Lady Reading Hospital Peshawar Pakistan (Latif 2020). Following an increased influx of COVID-19 patients to our hospitals, the government of Pakistan declared a health emergency and announced strict lockdown for an indefinite time period. We had been receiving an increasing number of children with supracondylar humerus fractures daily during the COVID-19 pandemic lockdown in Lady Reading Hospital in Peshawar, Pakistan. This was due to the fact that children were entirely confined to their homes and were more prone to injury during play time in a limited and unsafe environment. Furthermore, as peripheral and district level healthcare services and private clinics had been closed temporarily by the government, children were referred to our hospital as our hospital is the largest tertiary care teaching hospital of this province.

The objective of our study was to determine the temporal variations and mechanism of injury of supracondylar humerus fractures presented to the Accident and Emergency Department (A&E) at Lady Reading Hospital in Peshawar, Pakistan during the COVID-19 pandemic lockdown. We claimed that our study was the first study on this topic in our country. The results of this study will be used to anticipate the day of the week and hour of the day of arrival of supracondylar fractures to A&E. This will help us in prompt allocation of adequate resources in the form of dedicated paediatric orthopaedic surgeons, operation theatres and supporting staff without affecting regular surgical work. Furthermore, knowledge of the exact mechanism of these fractures will help us to improve the safety profile of children's playing environment inside home.

Methods

This descriptive study was conducted in the Accident and Emergency Department at Lady Reading Hospital in Peshawar, Pakistan. The duration of our study extended from the COVID-19 pandemic lockdown from 18th March 2020 ("Strict Lockdown") until 18th June 2020 when relaxation in the lockdown ("Smart Lockdown") was allowed and partial elective hospital services of our hospital were resumed. The questionnaire and methodology for this study was approved by the Ethical Review Board (ERB) at Lady Reading Hospital in Peshawar, Pakistan. The principal investigator has obtained a Good Clinical Practice Certificate from the National Institute on Drug Abuse (NIDA), Center for Clinical Trials (CCTN) and Clinical Trials Network (CTN) and has ORCID ID: <http://orcid.org/0000-0001-7894-0340>. Children of either gender and age up to 12 years with supracondylar

fractures received in A & E department within 3 days after sustaining the fracture were included in the sample. Children operated upon in other hospitals were excluded. The sample size for the study was 160 and calculated with the help of formula $n = Z^2 P(1-P)/d^2$, whereas n=Sample size, Z=level of confidence (95% or 1.96), P=prevalence (0.12) (Mangwani et al. 2006) and d=Precision (5% or 0.05). All children of supracondylar fractures received in the Accidents and Emergency Department of Lady Reading Hospital in Peshawar were thoroughly assessed and resuscitated according to ATLS protocols. The children were given analgesics for pain relief and the fractures were splinted. Radiographs of the elbow joint antero-posterior and lateral views were done and fractures were classified according to the Gartland classification system (Gartland 1959).

Distal neurovascular status was documented. Patients of supracondylar fractures meeting the inclusion criteria were admitted and operated as per hospital protocol. For the included children, a complete history and physical examination was done and informed written consent was taken from parents. All children with Gartland type-I fractures were treated in splint, while type-II and III were treated with closed reduction/percutaneous pinning under image intensifier or open reduction and pinning as required. Temporal variations or day and time of fracture occurrence, exact details of fracture mechanism, height of furniture or equipment from which the child fell and the type of landing surfaces were inquired from parents of each and every child and recorded. For convenience we divided the fracture mechanisms into six categories (Okubo et al. 2019) as follows:

- I) **Tumble**, on outstretched elbow at ground level while playing and running.
- II) **Fall**, on outstretched elbow from above ground level (climbing, bicycle, chair, bed, table, stairs etc.)
- III) **Lateral bend**, the elbow during sports or accidents.
- IV) **Direct hit**, smashed by an object or the elbow got caught in the door.
- V) **Throw**, injured after throwing a ball or other object.
- VI) **Unknown**.

Statistical analysis of our data was done by using SPSS version 20. Categorical variables like gender and fracture side was represented as frequency and percentage while mean \pm SD was calculated for numerical variables like age. A comparison of important variables like day and time of occurrence of supracondylar fractures, heights of furniture and landing or impact surfaces were done and Chi-square test was applied to calculate the P value. P value<0.05 was considered statistically significant. Results were presented in tables where necessary.

Results

The total number of children in our study was 160. Boys were 121 (75.6%) and girls were 39 (24.3%). Mean age of our patients were 5.3 \pm 1.3 years (range 3 to 9 years). Right supracondylar was fractured in 26 (16.2%) and left in 134 (83.7%). Bilateral fractures were not reported in our series. Supracondylar humerus fractures

were associated with clavicle fractures in 8 (5%) children, proximal humerus fractures in 6 (3.7%) children and distal radius fractures in 5 (3.1%) children. Majority (80%, n=128) children were received in our hospital within 24 hours of sustaining the fracture, while 28 (17.7%) in 24 to 48 hours and 4 (2.5%) children were received within 48 to 72 hours of sustaining the fracture. Delayed presented children (2.5%, n=4) were initially treated with splints by traditional bone setters. Radiologically, all fractures were of extension types with Gartland type I fracture in 28 (17.5%) children, type II in 27 (16.8%) and type III in 105 (65.6%) children. The mechanism of fracture in the majority (75.6%, n=121) of children was due to a fall from height and 101 (63.1%) children had fracture due to a fall from furniture inside the home (Table 1). Overall, 138 (86.2%) children sustained fractures indoors while 22 (13.7%) children sustained fracture outside of the home on a nearby street. Majority (40.6%, n=65) of fractures were reported in the month of April followed by May (25%, n=40), June (21.2%, n=35) and March (12.5%, n=20). We noted that children sustained fractures more on Monday (23.7%, n=38) and Friday (19.3%, n=31) than on other weekdays ($P>0.05$) as shown in Table 2. Most (65.6%, n=105) children sustained fractures in PM while 55 (34.3%) children had fractures in AM. The peak time of occurrence of fracture was 1700 h and majority (86.2%, n=138) children were received in our hospital in 1800-2000 hr.

We identified four impact-absorbing surfaces beneath the furniture or play equipment on which the children landed after a fall from height and sustained fractures. These surfaces were carpet or mattress, cemented or tiled floor, grass and mud or sand (Table 3). Majority (88.4%, n=84/95) of children falling from height onto a cemented or tiled floor sustained Gartland type III fractures than other types ($P<0.05$), while only 1 out of 13 (7.6%) children got type III fracture ($P<0.05$) falling on mud or sand. Similarly, no type III fracture was noted in children who landed on a mud or sand surface after falling on an outstretched elbow at ground level ($P<0.05$).

The analysis of height of furniture or playing equipment revealed that the average height was 4.3 ± 2 feet (range 2.6 to 6 feet). A total of 55 (45.4%) children falling from a height of up to 4 feet had Gartland type III fractures, while 66 (54.5%) children sustained a type III fracture had fallen from a height of above 4 feet ($P>0.05$).

Majority (89.3%, n=143) of the fractures were closed while 17 (10.6%) children had open fractures. All the children were managed appropriately as per protocol. Closed reduction and percutaneous pinning under image intensifier was done in 92 (87.6%) children with type III fractures, while open reduction and stabilization with k wires in 13 (12.3%) children were done after failed attempts of closed reduction. Gartland type I fractures (17.5%, n=28) were treated with immobilization in a splint while type II fractures (16.8%, n=27) were treated with closed reduction and splinting. Pre-operative anterior interosseous nerve injury was noted in 4 (2.5%) patients while post-operative ulnar nerve injury was documented in 7 (4.3%) patients.

Table 1. Aetiology and Classification of Supracondylar Fractures in Children

S.No	Mechanism of Fracture		Number of children	Percentage	Number of Gartland fractures (n=160)		
					Type I	Type II	Type III
1	Tumble		26	16.2%	12	11	03
2	Fall	From Furniture	101	63.1%	04	8	89
		From Bicycle	11	6.8%	01	04	06
		From Stairs	5	3.1%	00	01	04
		From tree	4	2.5%	00	01	03
3	Lateral Bend		3	1.8%	03	00	00
4	Direct Hit		5	3.1%	04	01	00
5	Throw		2	1.2%	02	00	00
6	Unknown		3	1.8%	02	01	00

Table 2. Day and Time of Supracondylar fractures of Humerus in Children

S.No	Day of Injury	Number of fractures	Percentage	AM	PM	P value	Time of Injury			P Value
							0000-1159	1200-1559	1600-2359	
1	Monday	38	23.7%	14	24	0.2	14	10	14	0.6
2	Tuesday	21	13.1%	07	14	0.3	07	04	10	0.3
3	Wednesday	18	11.2%	07	11	0.4	07	03	08	0.2
4	Thursday	22	13.7%	06	16	0.3	06	07	09	0.4
5	Friday	31	19.3%	10	21	0.2	10	11	10	0.1
6	Saturday	17	10.6%	06	11	0.3	06	03	08	0.3
7	Sunday	13	8.1%	05	08	0.4	05	02	06	0.2

Table 3. Frequency of Different Supracondylar Fractures Sustained on Different Landing Surfaces

Aetiology	Landing Surfaces												Total (n=147)
	Carpet/Mattress			Cemented/Tiled Floor			Grass			Mud/Sand			
	Type I	Type II	Type III	Type I	Type II	Type III	Type I	Type II	Type III	Type I	Type II	Type III	
Tumble	01	02	01	01	04	01	01	03	01	09	02	00	26 (17.6%)
Fall	Furniture	02	03	13	02	05	76	00	00	00	00	00	101 (68.7%)
	Bicycle	00	00	00	01	02	04	00	01	01	00	01	11 (7.4%)
	Stairs	00	00	00	00	00	02	00	01	02	00	00	05 (3.4%)
	Tree	00	00	00	00	01	02	00	0	01	00	00	04 (2.7%)
Total	03	05	14	04	12	85	01	05	05	09	03	01	147

Discussion

Due to the COVID-19 outbreak, the government of Pakistan strictly instructed the public to stay inside their homes. As a result children were confined to homes. This was reflected from the findings of our study as the majority (86.2%, n=136) of our children sustained fractures indoors, while only few children (13.7%, n=22) sustained fracture outside home on a nearby street. In an epidemiological analysis

of 488 paediatric elbow fractures, Okubo et al. (2019) reported that supracondylar fractures were the most common (43.8%, n=214), followed by lateral condyle fractures (22.3%, n=109). Overall the most common cause of fracture in this study were also indoor falls noted in 242 (49.5%) children with indoor causes, such as falls from a chair in 18 (3.6%) children, sofas in 11 (2.2%) and beds in 6 (1.2%) children. Outdoor falls from playground equipment were responsible for fractures in 14 (2.8%) children, with falls from trees in 11 (2.2%), iron rods in 11 (2.2%) and aerial ladders in 10 (2%) children. Analysis of other fracture mechanisms revealed that tumbles had caused fractures in 214 (43.8%) children, lateral bends in 9 (1.8%), direct hits in 11 (2.2%), throws in 10 (2%) and unknown mechanisms in 10 (2%) children. These authors, however, narrated that this aetiology was not for supracondylar fractures alone, but for all paediatric elbow fractures. Furthermore, the frequency of fractures were highest in May (11.4%, n=56) and August (5.1%, n=25) in comparison to our study where we had noted highest frequency of supracondylar fractures in April (40.6%, n=65) and May (25%, n=40). These authors concluded that the frequency of paediatric elbow fractures could not be attributed to environmental temperature only because there were many other factors which could influence fracture rate, namely urban/rural setting, culture and holidays. Sinikumpu et al. (2017) and Khoshbin et al. (2014) also reported the peak incidence of supracondylar fractures in summer because children preferred to play in warm than in cold environments. Loder et al. (2012) documented 48 (13.5%) supracondylar fractures in the month of June, 46 (13%) in May, 30 (8.4%) in March and 27 (7.6%) in April. Seasonal variations of supracondylar fractures are important to understand in regions where great climate variations exist because effective resource utilization and cost planning can be improved.

In our study, right supracondylar was fractured in 26 (16.2%) and left in 134 (83.7%) children. This finding was similar to the studies of Loder et al. (2012) and Babal et al. (2010). The most likely explanation could be the possibility of dominant upper limb in use during play while the non-dominant hand assumed the position of protection during fall or injury. We considered this finding important because most (91%, n=123) children in our series were right-handed and parents could expect ease in feeding, dressing and ability to accomplish written school homework in these children.

Days and time analysis of our fracture data showed that children sustained fractures more on Monday (23.7%, n=38) and Friday (19.3%, n=31) than on other week days ($P>0.05$). Majority (65.6%, n=105) of the children were injured in PM while 55 (34.3%) in AM. The peak time of occurrence of fracture was 1700 h and most (86.2%, n=138) children were received in our hospital in 1800-2000 hr. It could be expected that since majority of these children would be operated at night and dedicated orthopaedic surgeons and efficient operating theatre staff would be of paramount importance. Somewhat similar to our study, Loder et al. (2012) noted that children sustained fractures more on Saturday (17.2%, n=61) and Friday (17.2%, n=61), followed by Tuesday (14.4%, n=51) and Monday (13.5%, 48). He documented that maximum fractures (68.2%, n=241) occurred in PM while 37 (10.4%) fractures occurred in AM. The peak time of fracture was 1800h in his study. Chai et al. (2000) noted male predominance of supracondylar fractures in

his series with majority sustained inside home and peak time of occurrence of majority fractures were at 1800. McRae and Nusem (2018) examined the clinical record of 569 patients who were treated for supracondylar fractures between 2004 and 2014. Most of the fractures were presented to the hospital around 1700-17:59 h. In our study the analysis of landing surfaces after fall and height of furniture or play equipment revealed that the frequency of type III fractures were more in children landing on cemented or tiled surfaces ($P<0.05$). The frequency was lower, however, on mud or sand landing surfaces ($P<0.05$). No significant increased frequency of type III fracture was noted in children falling from a height of 3 or more feet ($P>0.05$). Many authors studied the impact of surface characteristics and height of play equipment or furniture on the incidence of supracondylar fractures in children. Laforest et al. (2001) showed that children falling from equipment with a height greater than 2-meters sustained injuries 2.6 times more than those falling from a lesser height. Furthermore, he advocated that the resilience of the surface (represented by surface hardness and measured as ratio of maximum negative acceleration on impact in units of gravities to the acceleration due to gravity, G_{max}) on which children fall should be less than 200 g to reduce the incidence of injuries. They advised that sand should be used beneath the equipment as it reduces the severity of injuries. In an earlier study, Laforest et al. (2000) analyzed the data of 930 injured children and found that most children sustained injuries at home rather than at public playgrounds. He observed that 698 (75%) fractures were sustained when children fall down on grass while 232 (24.9%) fractures were sustained on sand beneath the play equipment. The author claimed that his study was the first epidemiological study to prove that grass was not a good protective surface beneath playing equipment. He therefore recommended that grass should be replaced by sand beneath playing equipment. Barr (2014) analyzed the data of supracondylar fractures in children over a 3 year period at a district general hospital. He documented that these injuries were more common during summer school holidays. Playground equipment was responsible for 38% of fractures while falls from furniture had caused fractures in 16% children in his series. Barr advised that since children could not be stopped from playing, only preventative strategies could be adopted to make playing areas safer. Lowering the height of play equipment, application of softer landing surface beneath the furniture or equipment and play supervision by parents or adults would be expected to reduce the incidence of supracondylar fractures. Barr's safety and preventative measures were endorsed by Park et al. (2010).

Gartland type III was the predominant type (65.6%, $n=105$) of fracture noted in our study. This was consistent with the studies of Cheng et al. (2001) and Mangwani et al. (2006), but in contrast to Houshian et al. (2001). Houshian et al. reported type I to be the predominant type of fracture and the possible reasons he stated was either low-energy trauma in his series or increased sensitivity of radiographs to detect undisplaced supracondylar fractures. Fiissel et al. (2005) was of the opinion that minor fractures in children were caused by falls from standing heights, while major fractures were caused by falls from height and 3.9 times more likely required reductions. Our study participants had a mean age of 5.3 ± 1.3 years (range 3 to 9 years) and the majority (86.2%, $n=138$) of children sustained fractures at home. Striano et al. (2020) assessed the differences in epidemiology of Gartland

type III fractures in 94 toddlers with a mean age of 2.11 ± 0.64 years and 378 older children with a mean age of 6.32 ± 1.89 years. These authors revealed that toddlers sustained fractures at home due to non-accidental causes while older children had more associated injuries often requiring open reduction. Loss of fracture reduction and cubitus varus was more frequent in toddlers than in older children. These authors advocated age-specific management of type III fractures.

In our study pre-operative anterior interosseous nerve injury was present in 4 (2.5%) patients while post-operative ulnar nerve injury was noted in 7 (4.3%) patients. A study of Khademolhosseini et al. (2013) of 272 children in Malaysia, reported pre-operative nerve injury in 9 (3%) children and post-operative ulnar nerve injury in 34 (12.5%) children, radial nerve in 3 (1.1%) and median nerve injury in 2 (0.7%) children. Barr (2014) noted nerve injury in 3 (3.5%) children upon presentation while post-operative neurological compromise was reported in 2 (0.7%) children in his series of 84 supracondylar distal humerus fractures of extension type. In a meta-analysis by Babal et al. (2010) the data of 5,154 supracondylar fractures revealed that pre-operative anterior interosseous injuries were present in 34.1% children. Post-operative iatrogenic ulnar nerve injury was noted in 4.1% and median nerve injury in 3.4% children. Babal was of the opinion that lateral pinning was associated with more chances of median nerve injury whereas ulnar nerve injury was more frequently seen with medial pinning. Mangwani et al. (2006) shared their ten year experience (1993-2003) of 291 supracondylar fractures and noted neurological deficit in 12 (4.1%) children on presentation and 9 (3%) children post-operatively. Canales-Zamora et al. (2020) analyzed the data of 277 children under 8 years of age and noted equal frequency of both pre-operative and post-operative neurological injury (1.44% each). LiBrizzi et al. (2020) documented an overall pre-operative neurological injury in 117 (9.5%) children out of his series of 1,231 supracondylar fractures. The anterior interosseous nerve injury was noted in 43 (36.75%) children. LiBrizzi noted a higher association of older age of children, high energy trauma and Gartland type III fractures with increased frequency of neurological injuries. Aparicio et al. (2019) reported that the frequency of neurological injuries were (6.4%, n=9) out of 140 children in his series.

In our study the peak time of occurrence of fracture was 1700 h and majority (86.2%, n=138) of children were received in our hospital in 1800-2000 hrs and were operated on at night. Although Ricci et al. (2009) reported adverse outcome with delaying surgical management of orthopaedic cases, on the contrary others such as Mehlman et al. (2001), Gupta et al. (2004), Sibinski et al. (2006), Iyengar et al. (1999) reported that delaying surgery of a supracondylar fracture did not affect the outcome significantly.

The incidence of supracondylar fractures and its surgical treatment is on the rise globally (Helenius et al. 2009, Salonen et al. 2013, Sinikumpu et al. 2016). Irrespective of any type of treatment, long-term morbidity had been reported in 25% of children with supracondylar fractures (Sinikumpu et al 2016). The preventive measures are thus justified and must focus on environmental, biological and behavioral factors and our study aids in understanding these factors. Paediatric injury rates and severity due to hazards of equipment can be reduced significantly

when optimal safe equipment height and landing surfaces are maintained (Sacks et al. 1992, Roseveare et al. 1999, Howard et al. 2005).

In this study 92 (87.6%) type III fractures were treated with closed reduction and percutaneous pinning under image intensifier, while open reduction and k wires fixation was done in 13 (12.3%) children after failed attempts of closed reduction. Khoshbin et al. (2014) reported 78.7% closed reduction and k wire fixation and 21.3% open reduction and k wire fixation in their series of 3,235 supracondylar fractures. Other studies documented conversion rates of percutaneous to open surgery in 22.4% to 47.2% cases (Aktekin et al. 2008, Turhan et al. 2008, Mazda et al. 2001). This debate of closed versus open surgery is important due to the fact that some previous studies had reported decreased range of elbow motion and increased carrying angle when supracondylar fractures were treated with open reduction rather than closed reduction and percutaneous k wire fixation (Ozkoc et al. 2004, Cramer et al. 1992).

In our study we were unable to document the exact nutritional status of children, but it is important because good nutritional status and adequate calcium and vitamin D have been shown to increase bone mineral mass and are protective against fractures in children (Bianchi 2007). Furthermore low socioeconomic status and excessive consumption of carbonated drinks have also been shown to increase the risk of fractures in children (Goulding 2007, Hallal et al. 2009). Majority of our study participants were, although poor, apparently healthy and without any genetic disorders or chronic debilitating diseases.

In literature, vascular injuries have been reported with supracondylar fractures particularly in Gartland type III fractures (Ottolenghi 1956, Campbell et al. 1995), but luckily we have not noted any vascular injury in our series. Supracondylar fractures due to child abuse, although reported in up to 20% of cases in literature, had not been noted in our series (Strait et al. 1995).

In our series, the majority (75.6%, n=121) of study participants were boys while girls were 39 (24.3%). This is in accordance with the study of Anjum et al. (2017). However, few other studies had documented no significant difference in the incidence of supracondylar fractures among boys and girls—rather, a higher incidence noted in girls (Lee et al. 2007, Milbrandt and Copley 2004).

About 17 (10.6%) children had open supracondylar fractures in our study. This was slightly higher than reported in previous studies where 1% to 3.4% of children had been reported to have open supracondylar fractures (Anjum et al. 2017, Skaggs and Flynn 2010).

We noted that 18 (11.2%) children had associated injuries along with supracondylar fractures. These injuries included clavicle fractures in 8 (5%), proximal humerus fractures in 6 (3.7%) and physeal injury to distal radius in 5 (3.1%) children. Other studies (Anjum et al. 2017, Skaggs and Flynn 2010, Cheng et al. 2001, Roposch et al. 2001) had reported the incidence of various associated injuries in up to 5% of children with supracondylar fractures, ranging from forearm fractures, clavicle fractures, proximal humerus fractures and physical injuries to the distal radius.

Majority (80%, n=128) of children were received in our hospital within 24 hours of sustaining the fracture while 28 (17.7%) in 24 to 48 hours and 4 (2.5%) children were received in 48 to 72 hours of sustaining the fracture. Delayed

presented children (2.5%, n=4) were initially treated with splints by traditional bone setters but no complication was noted. Usually our hospital received many children who had been initially treated by local bone setters, and even a few with complications like compartment syndrome and gangrene as a result of improper treatment. However during COVID-19 lock down people were only allowed to travel to hospitals which could be the possible explanation of only few cases being treated by bone setters. Anjum et al. (2017) reported that 39.9% of children in their study were received in hospital within 48 hours after sustaining the injury and they had not been treated by local bone setters, while 60% children reported after 48 hours and mostly were managed by bone setters initially. In developing countries of Asia and Africa traditional bone setters are more prevalent (Nwachukwu et al. 2011). Omololu et al. (2008) and Onuminya (2006) had documented that in rural areas more than 70% of skeletal injuries were initially treated by local traditional bone setters. Arora et al. (2008) had reported that more than 70,000 traditional bone setters are treating people in India alone. The usual reasons to consult these bone setters instead of qualified doctors or hospitals were superstitious beliefs, illiteracy, fear of surgery and inability to afford hospital cost (Nwachukwu et al. 2011).

When we searched the literature for the impact of the COVID-19 pandemic on paediatric supracondylar fractures, we found variable results in different studies from different countries. Gumina et al. (2020) conducted a retrospective comparative cohort study at Sapienza University of Rome, Italy on the impact of COVID-19 on elbow trauma in children. These authors compared their data of paediatric fractures of the COVID-19 period extending from 8th March 2020 to 8th April 2020 with same but non-COVID period in the previous year (2019). In the non-COVID period, 6 children with elbow fractures were noted while in the COVID-period, 3 children with elbow fractures were documented. These authors observed no school injuries, sports injuries and high-energy injuries in children during the COVID-19 pandemic. Elbow fractures during the COVID-19 pandemic occurred at home due to accidental falls. Similarly, Bram et al. (2020) also reported a significant 2.5 fold reduction of paediatric fractures during the COVID-19 pandemic, but an increase in frequency of fractures occurring at home. Contrary to the above studies, Carkci et al. (2021) documented a statistically significant rise in paediatric supracondylar fractures during COVID-19 than the non-COVID period although overall patients' influx was reduced. Carkci was supported by Hashmi et al. (2020) who also reported a higher frequency of paediatric supracondylar fractures during COVID-19 than non-COVID period, but the difference was not statistically significant (P=0.63) in his study. Nabian et al. (2020) noted that paediatric supracondylar fracture was the third-most common fracture presented during COVID-19 after distal radius and radius ulna fracture. Oguzkaya et al. (2021) studied the impact of COVID-19 on the epidemiology of 67 paediatric fractures and noted that the most frequent indication for surgery during COVID-19 was the paediatric supracondylar fracture.

Our study had few limitations. The design of our study was descriptive and we were not able to measure the resilience of the impact absorbing surfaces beneath furniture or play equipment (g max). The exact correlation between falling height and impacting surfaces could not be determined. Moreover, indoor playing activities of children vary due to socioeconomic and cultural differences and our

results might not be generalized directly for other areas or countries. We suggest further large-scale, well-designed studies to address these limitations and confirm our results.

Conclusion

Currently no other study exists which assessed the temporal variations and mechanisms of paediatric supracondylar fractures presenting to the hospital during the COVID-19 pandemic. Our study demonstrated that the majority of children sustained fractures due to falls from furniture and landing on hard cemented or tiled surfaces at home. Maximum number of fractures was reported in the month of April and on Monday. Most of these fractures occurred in the evening and were operated on at night. The increased frequency of paediatric supracondylar fractures in the COVID-19 pandemic supports that preventative strategies should focus more on adult supervision, prevention of falls from furniture and provision of softer landing surfaces to lessen the impact of injury. For optimum care of these fractures, dedicated night operation theatres with trained staff are mandatory.

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Topics on Mass Media and Communication

The Relevance of Scientific Dissemination during the Vaccine Campaign: The Italian Virologist Communication on Social Media

Noemi Crescentini & Giuseppe Michele Padricelli

The scientist role has progressively gained an essential relevance during the 2020 pandemic. In fact, the virologists' exposition turned out to be fundamental for the public opinion, both for the well-informed and people unaware about health, transmission, infection and, today, vaccination programs. This paper aims to first set an explorative investigation about the social communication practices during the first three months of the vaccine campaign addressed on social media by Italy's most established virologists. The arising digital scenario and the resultant pervasive presence in our daily life of web platforms, such as social media, has revolutionized the nexus between science and society. More scholars argued about the disintermediated current shape of science communication that directly connects scientists and the larger public, driving the sociological debate towards the analysis of the current processes of sense-making construction. On this assumption, we aim to answer the research question about how Italian scientists communicate and approach the larger public on social media. Therefore, the empirical part of this paper consists of a data collection phase conducted on Facebook and Twitter. The collected data have been analyzed by a content analysis oriented to identify the contradictory or uniformity of disintermediated communication features of the observed social media profiles in order to push and follow, during the ongoing vaccine dosing program, a proactive reflection about the key role of scientific dissemination of information.

Keywords: *communication of science, scientists' visibility, social media communication, content analysis, topic modelling*

The Communication of Science Inside and Outside the Digital Environment

The relationship between science and society has become increasingly relevant nowadays. Following Ancarani (1996), science has been gradually faced with a variety of politically-relevant social and economic issues such as health, food, transport, communication, energy, innovation and so on. Meanwhile, the public space got transformed focusing citizens as, “the depositary of the structures and processes of democracy as the power control, the delegation of people’s will, public discussion and public opinion” (Mazzoleni 2004, p. 17).

Ty, therefore, institutions representing science and the researchers themselves cannot neglect communication in their daily work (Scamuzzi and Tiplado 2015). In particular, science’s public communication has an essential role in defining the relationship between researchers and citizens (Bucchi and Trench 2014) and now, a scientist is socially appreciated if he manages to reduce the distance between these subjects. In this perspective,

“the need for a close relationship between science and society, between experts and the public, arises in a process of involvement that allows us to grasp the urgent needs of humanity” (Pellegrini 2018, p. 33).

Beyond the different levels of analysis of communicative phenomena and consistent models that have outlined the relationship between science, scientists and the various types of audience (Jasanoff 1997), scientific communication studies agree that the mediator role is

“a central variable for the regulation of the processes of constructing meaning, able to orient exchanges between the issuer and the recipient towards outcomes not at all obvious, even with equal content of messages” (Scamuzzi and Tiplado 2015, p. 68).

In light of this assumption, the Internet represents the mediatic environment that has succeeded in revolutionizing the communication of science simultaneously to its evolution. Firstly, intended as a canonical medium deputed to the information storage (*read-write web*), the web changed over the last 20 years, transforming itself in an integrated participative environment (*people-centric web* and *participative web*) (Patel 2013).

There are many web-based activities that scientists carry out daily, as for example document transmission, magazine editing, data sharing, article creation, publishing of conference proceedings and informal exchanges also via videoconferences. In this way, Pellegrini and Saracino in fact argue about “Science 2.0” as an

“increasingly widespread practice among scientists of publishing online experimental results, emerging theories, claims of discoveries and drafts of articles that anyone can read and comment on” (Pellegrini and Saracino 2019, p. 76).

Furthermore, Science 2.0 cannot disregard communication through the social media sphere, by which it is possible to create networks of collaboration (i.e. *Researchgate* is designed to allow relationships between researchers related to any type of discipline), to spread news and rebut scientific controversies. Today, science and society work together because they allow citizens to take a stand on scientific issues, which used to be “an exclusive prerogative of the scientific community and political decision-makers” (Bucchi 2010, p. 141).

Before Internet affirmation, the mainstream media such as radio and TV were the only promoters of communication of science to citizens, although,

“by their nature they point out the evident asymmetry between the scientific community and the general public and the clear directionality of science communication” (Scamuzzi and Tiplado 2015, p. 150).

In the past, traditional media acted as an intermediary between universities and the public sphere, for example through press releases, while with the advent of digital information shifted in an open-access vocation, accessible to anyone who is interested. In this way online media offers scientists more communication opportunities in dealing directly with the public, rather than relying on journalists as mediators (Peters et al. 2014).

The web, furthermore, connotes as an environment where a greater participation about scientific knowledge is possible, and at the same time, can reveal traps related to scientific controversies or misinformation in the way that

“the web breaks that sequential order and the tightness of a series of ‘filters’ that previously distinguished the path of scientific results of the researcher to the general public” (Bucchi 2006, p. 72).

Although it has finite limits, “the web can allow a faster and immediate access to scientific information (possibility to access original papers, databases, contacts of researchers)” (Scamuzzi and Tipaldo 2015, p. 150), and in addition social networks become useful tools to simplify the communication of science and its results, as well the understanding of how research has been led.

Following Bucchi and Saracino (2021), it is relevant to point out how the science communication concept for scientific arguing has been recently rethought also due to the increasing public demand about science and technology discussions. The science communication overcomes the classical processes of mediated communication shifting to direct interaction between the sender and the public, driving towards a model pointed in 3 specific strategies (Pellegrini and Rubin 2019, pp. 71–72):

1. The vertical one: featured by the direct dissemination of press release and scientists’ statements to spread the research outcomes to a general public.
2. The dialogic one: featured by discussion events between experts and publics duly shaped on new scientific topics.
3. The participative one: the last strategy concerns the direct involvement of individuals in the research works in order to enrich the research purposes and shape the right interesting topics of investigation.

In accordance with this background, this paper aims to shed light on the current relation between scientists and citizens in Italy. Though a first exploration oriented around the scientists’ social media presence, in fact, we will try to comprehend how they set their communication strategies and styles as a unit of analysis selecting the cultural products of their posting activities. For this reason, the empirical part of our work starts from a specific research question: referring to the topic of the current vaccination campaign, how do scientists communicate and approach the public on social media?

We tried to answer this question by first conducting explorative research related to the Digital Ethnography (Murthy 2008, Coleman 2010) in line with the Rogers (2009, 2013) vision of digital methods. We extracted the material directly connected with observed phenomena making a further primary use of secondary web data. Later, during the data collection, we set a quantitative content analysis of social media posts uploaded by selected subjects whom we observed on two specific social media platforms during the first 3 months of the vaccine dosing campaign in Italy, from December the 27th 2020 to March the 27th 2021.

Crisis Communication in the Time of the 2020 Pandemic

Through traditional and digital media, scientific communication has taken on an important role during the COVID-19 pandemic. In the specific case of Italy, it

increased the exposure of several scientific experts: virologists, immunologists, and so on, who have provided to the larger public important scientific information about health, transmission, infection and, today, vaccination programs, and also proper instructions to follow concerning the correct behaviour to adopt to face the pervasive contagion (Brondi and Pellegrini, 2021). The speeches, often discordant especially in the first phase of the pandemic crisis, occurred on traditional media and social networks, with different styles.

The COVID-19 crisis poses significant challenges for how science is conducted and communicated (Lasser et al. 2020). The 2020 agenda setting “was substantially monopolized by the COVID-19 pandemic, the most prominent feature in the news of the year” (de Sola Pueyo 2021, p. 1). This drove an *infodemic*, following Hua and Shaw (2020),

“as the overabundance of information, sometimes not accurate, that creates difficulties for society to understand which resources to use to access reliable information” (de Sola Pueyo 2021, p. 1).

Following Hussain (2020), through social and mass media it is possible to transmit a sense of unity due to large public coverage as well the opposite:

“Social media may also provide grounds for misinformation and discrimination. People can utilize the flexibility and pervasiveness of social media technologies to increase the public’s adherence to the safety measures suggested by global health organizations to combat the spread of COVID-19.”

Following Bucchi (1996) in certain situations, usually connected to scientific controversies, scientists start to address the public directly by skipping the usual stages of scientific communication in the way that

“these situations create a new modality in science communication that is associated with different objectives and tactics compared to the traditional dissemination pathways” (Olesk 2021, p. 6).

In accordance with this assumption, the best way to directly address the public is through the architecture of a digital scenario and the disintermediated communication assets of the web environment, i.e., the social media sphere.

Social media platforms such as Twitter or Facebook ensure, in fact, support and resilience between communities, “providing direct access to an unprecedented amount of content and amplifying rumours and questionable information” (Cinelli et al. 2020, p. 1).

Furthermore, according to Hussain (2020), the specialists are involved in a time of crisis, such as the pandemic, to turn their expertise into communicating with their followers what’s happening and the overall situation in their premises at local, national and international levels.

Among these, of course, there must necessarily be scientists with strong disclosure skills called to deal with proper communication on social networks.

Research Design

To better comprehend which scientists are involved in our exploration among the few who have progressively exposed disseminating their expertise on social media throughout 2020, we referred to a recent study by *Reputation Science*, a research center specialized in crisis management consulting, particularly in the scientific context.

Figure 1. *Virologists' Overall Classification*



Source: Reputation Science.

This center synthesized an overall classification³ concerning the scientist visibility on mass and social media from February 1st to November 20th. This classification (shown in Figure 1) followed two specific indexes based on the scientists' public statements. The *alert index* concerns scientists' most frequent opinion related to the control and containment solution for the pandemic, while the *coherence index* concerns the contradictions of their public statements over the last year.

An in-depth inspection of the biographies of all the scientists qualified in this classification was done, and we selected 5 of them according to their social media presence.

³COVID-19: The expert communication. Available at: <https://www.reputationscience.it/analisi-da-gli-esperti-italiani-sul-covid-19-sovraccarico-di-informazioni-e-indicazioni-incoerenti/>.

The Selected Scientists

4 profile. In 1988 he was a Visiting Scientist at the *Center for Molecular Genetics* at University of California at San Diego, while in 1991 he was Visiting Investigator at *the Department of Immunology* of the Scripps Research Institute in La Jolla, California (USA) where he worked in Dr. Dennis R. Burton's lab.

In 2004, Roberto Burioni worked as a *Faculty of Medicine and Surgery* at the University Vita-Salute San Raffaele in Milan. Today he is currently a Full Professor of Microbiology and Virology, as well as the head of an immunological research laboratory. His research studies concern the field of development of human monoclonal antibodies against infectious agents. Burioni became famous during the late 2010 years with his media interventions, especially on the issue of vaccines to counter disinformation on social media. His activity on scientific dissemination also reached TV platforms, allowing his reputation to gain more visibility. In November 2018 he opened a website: *Medicalfacts.it*, dedicated to scientific dissemination in the medical field. In 2019 he founded the Association "Pact for Science" whose goal is to enhance the scientific evidence at the basis of the legislative and government choices of all political parties. He published several books on scientific divulgation and for this he has won several prizes. From the beginning of the pandemic crisis until today, he appears as a regular guest on the TV program "Che Tempo che fa" conducted by Fabio Fazio which airs every Sunday at dinner time on the national broadcasting service Rai3.

The second scientist involved in our exploration is Ilaria Capua, a virologist of national and international fame. In 2000 she developed the strategy Differentiating Vaccinated from Infected Animals (DIVA): the first vaccination strategy against avian flu, whose test is able to detect whether antibodies in a subject were induced by the vaccine or infection. Ilaria Capua is responsible for an atypical action in the scientific field dated in 2006: she challenged the system - obtaining international resonance - deciding to make the gene sequence of the avian virus public. This sparked a conversation around the birth of *open-source science*.

In 2013 Ilaria Capua decided to run for the Italian Parliament being elected as the leader of her Civic Choice party. From May to July 2015, she was vice-president of the Chamber of Deputies in the Twelfth Commission (Social Affairs). She was put to criminal proceedings then acquitted (for conspiracy aimed at the commission of crimes of corruption, abuse of office and illicit trafficking of viruses) which caused considerable inopportuneness in her personal life. In September 2016, she decided to resign as a deputy and moved to Florida where she got employed as researcher. In the United States she heads a department of the *Emerging Pathogens Institute* of the University of Florida. She later became director of the University's One Health Center of Excellence. She is also currently a resident guest at *Dimartedi*, a program of the Italian Tv channel La7.

Furthermore, we involved Fabrizio Pregliasco, a researcher of the *Department of Biomedical Sciences for Health* of the University of Milano Statale. He is author of expert reports for *European registration of a vaccine and flu medication*. During his professional life he has collaborated in 12 clinical trials of vaccines and antiviral treatments. In 2015 he was selected as Director of Health at the Galeazzi

Orthopaedic Institute in Milan. Subsequently he also became a consultant to the *National Council of Economy and Labour* (CNEL), as well as to the *National Council of the Third Sector* (social, economic and cultural reality in continuous evolution that includes bodies that are neither public nor commercial). Both these roles are carried out by the Ministry of Labour.

Since 2013 he has been the president of ANPAS (an association committed to provide public assistance). The efficiency in the activity of scientific dissemination is the primary reason behind the esteem that the community of experts has towards Fabrizio Pregliasco; during 2016 such an appreciation found concrete form in the conferral of *National Scientific Medical Union of Information* prize.

During the *coronavirus* emergency he is called to take on the role of scientific supervisor, a role assigned to cope with the many deaths that occurred in Milan at the *Pio Albergo Trivulzio*, a historic place of the city, residence for the elderly, which accommodates over 1,000 patients. After the numerous deaths and at the same time of the assessment of responsibilities, his role helped *Pio Albergo Trivulzio* to implement a new organizational structure. He is a sporadic guest in TV programs on La7 and Rai channels.

Antonella Viola is another scientist we observed in our research. She received a scholarship awarded by the European Research Council in 2014: two and a half million Euro in recognition of her STePS project, considered a revolutionary program with regard to the evidence on immune defenses against cancer. In the same year, she became associate professor in general pathology in the *Department of Biomedical Sciences* at the University of Padua. Today she is also a member of the scientific committee of the *Italian Association for Cancer Research*, as well as being an auditor for the European Commission dealt to the evaluation of scientific excellence projects. Thanks to her contribution to molecular biology, Antonella Viola became part of the *European Molecular Biology Organization*.

Finally, in parallel to her teaching and laboratory activities, she's responsible for promoting scientific dissemination, especially in the framework of the *European project Eufactor*⁴. Viola is also particularly appreciated as a speaker; her clear style leads her to travel the world as a speaker at conferences at prestigious institutions. Among the most appreciated speeches are those at TED Talks. She is a sporadic guest for TV programs on La7 Channel and on Radio tune *Radioradicale*.

Finally, the last scientist selected is Alberto Zangrillo, head of the *Operative Unit of Anesthesia and General Reanimation and Cardio-Thorax-Vascular*, Head of Clinical Areas of the IRCCS at the San Raffaele Hospital in Milan and collaborates at the *La Madonnina Nursing Home*. He is a pro-rector professor and Full Professor of Anesthesiology and Rianimation. Following SCOPUS⁵ sources,

⁴The project of 2016 is aimed at young people between 16 and 19 years and was created to raise awareness of the study of science, technology and computer science, directing them towards training and professional paths that offer more opportunities, but they are often discarded because they are considered difficult or boring. The campaign also targets stakeholders and the general public, to draw attention to the importance of science and technology and to give visibility to the European Union's commitment in these areas.

⁵SCOPUS is currently the largest bibliographic database of abstracts and citations of scientific literature. Index over 17,700 titles of scientific, medical, technical and humanistic journals, published by over 4,000 publishers. Among the most important citation functions Scopus allows to obtain: the

today he is one of the top ten doctors in the world for the number of publications in the field of anaesthesia and intensive care, author of 800 publications, of which 400 are indexed in international journals which include randomized studies in *The New England Journal of Medicine*, *JAMA*, *Circulation* and *British Medical Journal*.

His media experience is linked with the former Prime Minister Silvio Berlusconi. Zangrillo has always been at his side, especially in the most difficult moments for his health, such as on 13th December 2009 when Silvio Berlusconi (at that time Prime Minister) was hit by a small statue; or seven years later, when the leader of the centre-right party was subjected to a complex cardiac intervention at the San Raffaele.

By virtue of its authorial activity, he collects numerous awards and honours from the scientific community. Also, the institutional offices seem to recognize the merit and confer the merit titles by the Presidents of the Italian Republic, Carlo Azeglio Ciampi and then Giorgio Napolitano. He takes part sporadically on TV programs on Rai, Mediaset and LA7.

Methodology

Social Platforms and Data Collection

As context units, we selected two specific social media platforms: *Facebook* and *Twitter*.

In the recent study of the Yearbook of science Technologies and society, Pellegrini and Saracino (2019) from the research center *Observe – Science in Society* showed interesting results related to how *Facebook* turned out to be a very suitable social platform where Italian citizens are reached by scientific-health centered content, and through which the public fruition becomes more frequent. On the other hand, *Twitter* turned out to be the opposite (Table 1).

Table 1. *Reading and Sharing of Contents Concerning Health and Medicine (Valid % N=978)*

	I read contents about health and medicine			Total
	Never	Sometimes	Frequently	
Facebook	25.5%	52.7%	21.8%	100%
Twitter	67.4%	24.6%	8%	100%

Source: Pellegrini and Saracino (2019), *Yearbook of science Technologies and society*, An insight on the relation between scientists and publics.

According to this evidence, more scholars (Schultz et al. 2011, Eriksson and Olsson 2016) argued about the perceived usefulness of *Facebook* and *Twitter* in crisis communication. Compared to other sources related to the digital scenario,

H-Index or Hirsch Index (proposed in 2005 by Jorge E. Hirsch of the University of California at San Diego), is a bibliometric indicator that measures the impact of authors within the reference scientific community, based on number of publications and number of citations received; -to carry out the citation analysis of the authors and their relatives publications (through the Citation Tracker); to carry out the research and analysis of the authors' profile and membership affiliations.

Twitter leads to less negative reactions than blogs and newspaper articles, while Facebook results in a higher reputation and less secondary crisis reactions than crisis communication via an online newspaper (Eriksson and Olsson 2016, p. 200).

On the base of these assumptions, we started the data collection procedure on Twitter using the *scraping* procedure via *Python syntax*, while for Facebook we used *CrowdTangle*, an insight tool reserved to the academic hub that only tracks publicly available posts on Facebook, Instagram and Reddit.

The data have been collected following the structure of a proper standard gather grid (Losito 2003, Amaturò and Punziano 2013) divided in 4 main domains (General information, Cross information, Engagement and Audiovisual and Text information) and then organized in a Cases per Variable Matrix composed by 1,306 observations⁶ per 13 variables defined as follows in Table 2.

Table 2. *Standard Gather Grid*

General Information	Cross Information	Engagement	Audiovisual and Text Information
Account (Viola, Burioni, Capua, Zangrillo, Pregialso)	External Sources (No external source, Press, Institution and Government, Science Journal, Scientific Network, Scientific Press, Conference Promotion, Official website)	Like (Low, Medium and High Likes)	Audiovisual Description (No audiovisual elements, Data, infographics, Media promotion, Normative alert, personal promotion, Press screenshots, Scientific publication extracts, Social media screenshots, visual and logo, Web events)
Date (December, Early January, End of January, Early February, End of February, Early March, End of March)	Repost Account Source (original post, Repost from Press Institution and Government, Repost from Scientific network and Scientific Journals, Repost from other profiles)	Comments (No Comments, Low-medium comments and high comments)	Text (Post corpus)
Platform (Twitter, Facebook)	Tag (No Tag, Institution, Press and other profiles Tag, Scientific network and Scientific journals Tag)	Share (Low, medium and high share)	Text length (Short, medium and long length)
Post Type (Tweet, Retweet, Tweet Photo and Video, FB Status, FB Status Repost, Facebook Photo and video, Facebook Photo and video Repost, FB Link)			

⁶All the posts were composed in the Italian native language.

The selected scientists' profiles are situated in the account variable while the date variable concerns the month when posts have been uploaded. All content have been classified according to the platform uploading (Twitter and Facebook), and so too its classification unit (audiovisual or textual) duly specified in the post-type variable by which furthermore come possible to recognize the original or repost content.

The external sources concern the context from which comes the external links tied to the posts while the variable named *Repost Account Source* concerns the categorization of the account from where only reposts come. All Tags in posts have found place by a right categorization of the other mentioned social media accounts. As for the engagement, *likes*, *comments* and *shares* have been classified in tercile intervals that match low, medium and high engagement levels, while pictures and video descriptions have been categorized by the symbolic representation of audiovisual material posted in audiovisual description variable. Finally, we collected the text of every post as well as the text length, properly classifying them, following short, medium and long criteria cutting tercile intervals.

All the information contained in the dataset have been processed following multi-stage analytical procedures consisting of the application of the *topic modelling* aimed to point the features of the vaccination program discussion on social media during the timespan we observed. Then, it was processed in the application *Multiple Correspondence Analysis (MCA)* which makes it possible to detect the latent dimensions by which mark the correspondence between topics and the other context variables (platform, type of post, engagement and external sources). Later, the *Lexical Correspondence Analysis (LCA)*⁷ turned out to be the best way to a right synthesis of the collected data; by a compact graphic representation of data relations projected on factors, we could point concepts not previously observable by which find the right key-interpretations based on the correspondence between the selected variables and most characteristics words of post texts.

Analysis and Discussion

The Topic Modelling

The post texts present a considerable amount of information by which is difficult to trace a semantic structure. For this reason, we offered the empirical base to a simple but statistically robust solution: the topic modelling.

As a first step, we imported the database in *T-Lab*, a specific software environment for the content analysis able to process proper patterns based on textual context. We submitted the text variable, consisting in the corpus extracted by Facebook and Twitter, to *T-Lab* thematic analysis procedure that is preceded first of all by the proper following automatic processes. Lemmatization consists of

⁷The LCA is a factorial technique concerning textual data and useful to: synthesize information contained in texts; make graphic displays of association networks among words and between words and texts; show the connections between text and context data (Lebart et al. 1998).

1) the standardization of all the verb forms in the same mode; 2) the transformation of nouns and adjectives posed in singular number; and 3) the removing of definite-indefinite articles. The frequency threshold was set on 20 occurrences which led us to exclude all the words below this frequency value and finally reducing the database to 650 total words in the analysis. Finally, we proceeded with the exclusion of empty segments found insignificant or irrelevant to our analysis. Later we setup the modeling aimed to the topic extraction based on the *Latent Dirichlet allocation* (LDA),

“a generative probabilistic model for text document collections based on a three-level hierarchical Bayesian model, in which each item of a collection is modeled as a finite mixture over an underlying set of topics. Each topic is, in turn, modeled as an infinite mixture over an underlying set of topic probabilities. In the context of text modeling, the topic probabilities provide an explicit representation of a document” (Blei et al. 2003).

Following this procedure, we extracted 10 topics properly renamed, respecting statistical criteria, such as the consideration of specific word occurrences featuring the topic, as well as the low-high shared words occurrences among all topics, and by the *semantic tagging* (Bolasco 2013, p. 126) on selected content in order to “detect the right document meaning solving disambiguation and identifying concepts by a set of words.”

Finally, we classified the 10 topics considering the 985 emerging elementary contexts intended as the document analyzed fragments in which the topic itself comes more relevant.

Following Habert (2005), in fact the more significance parts of documents are regarded by the information weight of its fragments featured by its discursive formulas, their position in the document, the specific weight of each word related to its scatter in the document, etc. In our case, the resume of elementary contexts in T-lab returned us to follow a hierarchical order based on the informative score of a single fragment, which text reduction had been synthesized by a 95% threshold. The emerged topics have been duly defined as shown in Table 3.

Table 3. Topics Description

Topic Name	Most frequent Words (Specific, Shared with high probability, Shared with low probability)	Elementary context examples
Virus Mutation	Variation, Virus, Our, New, Greater, Pandemic, Mutation, English, Government, South African, Sars, COV, Last, Child Bambino, Bring, Make, Feed, Hard	<ul style="list-style-type: none"> • What is the South African variation and why we worry about? Is a variation featured by 3 worrying mutations concerning Spike protein. The best known N501Y, usual also to the English variation and 2 others K417N and E484K further to increase the virus transmission. • The new viral variants distorted some of the data. The presence of virus variations in our country worries not only for their greater transmission power but also in the case of

		Brazilian and South African variation.
Effectiveness of Vaccine	Infection, Dosing, Patient, Before, Antibody, Use, Answer, Protection, Approve, Response, Serious, Demand, Base, Immune, Result, Generate, Immunity, Shape, Week, System	<ul style="list-style-type: none"> The answer to a single dosing vaccination that must be administered twice, but it suggests that for those patients, we could think to new and different protection forms. We wait for the results of the second dosing. The cover protection needs 7 days later the second dosing. The partial one 12 days later the first dosing. The news is “Outbreak in RSA in Prato” The fact that them were vaccinated or not one week before was not relevant.”
AstraZeneca Case	Vaccinate, People, Astrazeneca, Population, Decide, Uscire, Subministration, Receive, Problems, Respect, Event, Contagious, Address, Happen, Trust, Avoid, Tranche, Old people	<ul style="list-style-type: none"> L'AIFA has decided to advise against the vaccine use for the over 55. The reason is because data are not available about the vaccine efficiency for this year range and because it is a less effective vaccine than the others that protects only 6 people every 10 vaccinated. Can we vaccinate the 40 years old people who suffer from diabetes? I receive requests from those who have been vaccinated with the AZ tranche temporary removed by ISS. The tranche is not defecting as you ask me. The removal is precautionary and if you vaccinated you don't have to do anything. Fever is as this vaccine. No panic.
Relevance of Data	Data, Effectiveness, Risk, Effective, Clinic, Disease, Study, Modern, Demonstration, Lock, Safer, Subject, To limit, To work, Obtain, Community	<ul style="list-style-type: none"> Do the vaccines work against the new variations? First data are here. A revised research conducted with data obtained by Moderna tells that the antibody generated by the vaccines mRNA continue to recognize the variations, but with less efficiency. Moderna has declared that has started to generate an upgrade of vaccines. We based on pre-clinical data to declare that mRND vaccines let us hope that the infections could be stopped as well and that we have waited for other data never received. The mass vaccination held in Israel and UK let us to answer to this question basing on numbers and on the obtained data.
Preparation of Vaccine Campaign	Vaccination, Italy, Country, Us, Healthcare, Campaign, Scientific, Effect, School, Day, Citizens, Situation, Choose, to find, Amount, High, Serious, Take, Remember, Necessary	<ul style="list-style-type: none"> I waited for a different atmosphere for this vaccination campaign. A hard mobilization, vaccination centers open 24h and a generous activism. A power, touching atmosphere, as a war, as a last chance.
Scientific Network	Years, Science, Put, Health, Woman, Life, Bus, Ilaria, Capua, San, Raffaele, Hospital, Pregnancy,	<ul style="list-style-type: none"> At San Raffaele we don't stop even during holidays! Here Ottavio Cremona, full professor in human anatomy who takes the vaccination against COVID-19.

The Relevance of Scientific Dissemination during the Vaccine Campaign...

	Laboratory, March, Future, Human	<ul style="list-style-type: none"> I'm proud of this awesome multidisciplinary team IRCCS Ospedale San Raffaele Università Vita Salute San Raffaele!
Vaccine's Supply	Time, Arrive, Year, Production, Produce, Possible, First, Million, Think, Case, Delay, Available, Safety, Divide, Exclusive, United	<ul style="list-style-type: none"> BioNTech, the company that pointed one of two mRNA vaccines has bought in September a factory from Novartis to be used for the vaccine production. Has been needed 28 days for the implementation, 60 to start the production the vaccine. There's hype for the Russian vaccine Sputnik, thinking to a direct production here before to obtain the EMA or FDA approve. Overcoming the political and economic interest why should us interest this vaccine and not Johnson & Johnson? Both are based on the same adenoviral vector.
Response Capabilities	Pfizer, News, Dosing, Days, Protect, Europe, EMA, Phase, Hope, Publishing, Continue, EU, Problem, Leave, Great, Death, Italian, Start, Together, Chance	<ul style="list-style-type: none"> "Good news. After millions of administered doses (two also for me) the EMA confirm the safety of Pfizer BioNTech PS after the second dose I've a soft pain in the arm dopo, soft headache, but 15 days ago after a tennis match I felt worst. The Pfizer vaccine seems to protect from the infection already from single dose. This is the better news of last times! We don't know how long last the immunity, so for now go on with the second doses respecting the schedule!
Scientist reputation	Burioni, Roberto, Doctor, See, Eric Topol, Vaccine, Aske, Read, Tweet, Know, Iene, Rectify, Work	<ul style="list-style-type: none"> I would spread the sources but newspaper will entitle as well "battle between scientists", "the doctors must agree each other before declaration" or the classic "nobody here is understanding". In any case I am already famous. I deleted tweets and I don't go to bed worrying about reading the newspapers that will disparage me tomorrow or the tweet trolls who send me hate. Both are not important, and not pleasant. This is the reason why I deleted tweets.
Media Presence	Covid, Speak, Explain, Coronavirus, Text, Professor, Chetempochefa, Facts, Medical, Emergency, News, Virologist, January, FabFazio, Pandemic, History, Tell, Dangerous	<ul style="list-style-type: none"> chetempochefa Tonight back #CTCF guest of ',fabfazio with the professor we we'll talk about the last news on the covid worsening in Italy and of vaccine situation, See you at 8pm on RaiTre. Adnkronos #CovidItalia, ', "Real Variatons: real emergency "Covid Italy" Pregliasco "Variants real emergence. Following the virologist "we need focused actions and screening at school. The next three or four weeks will be the most difficult"

Multiple Correspondence Analysis (MCA): The Factors' Building

Further, the topics as active variables deemed useful for the factor building were pointed also to *engagement rates, platforms, type of post* and *date*.

Scientists' reputation and media presence topics characterized in the same way as both the two factors, while the topics Virus Mutation; Effectiveness of Vaccine; AstraZeneca Case; and Relevance of Data, instead, characterized the first factor, posed on the horizontal axis, which reflects the argumentations related to the vaccine clinical value assessment divided into two characteristic parts. As shown in Figure 2, on the right side, renamed *Discussion introduction* in fact, we can notice low engagement and no topics emphasized on the factor, while on the left side, renamed *Controversial discussion*, we can notice high engagement levels which appeared in February and correspond to the controversial and delicate topics such as the withdrawal of AstraZeneca batches and *Vaccine effectiveness*. For these argumentations, Facebook and its relative post types appear as the most-used platform by the observed scientists, while for the quieter discussion the elected platform is Twitter.

The second factor, posed on the vertical axis, is characterized by topics such as *Vaccine campaign preparation; scientific network; vaccine supplies; and response capabilities*. This dimension reflects the vaccination plan features and is divided into two specific phases of our timespan of observation. The first two months in fact reflect the *run-up* of the campaign while the last two months refers to the *follow-up* and rating of the ongoing process of the vaccine dosing program.

The plan synthesizes how most of the observed subjects are more addicted to Twitter posting practices compared to Facebook, which is preferred only by Antonella Viola. Most of them prefer a social media exposition on Twitter that, following Eriksson and Olsson (2016), connects the microlevel of interpersonal communication, the meso-level of follower–followed networks and the macrolevel of hashtag-based exchanges, while Facebook is usually preferred for horizontal support among users during crisis situation as the pandemic, in this case electing a posting-logic based on original contents (Viola, Burioni and Zangrillo) or on shared post from other social media accounts (Capua and Pregliasco).

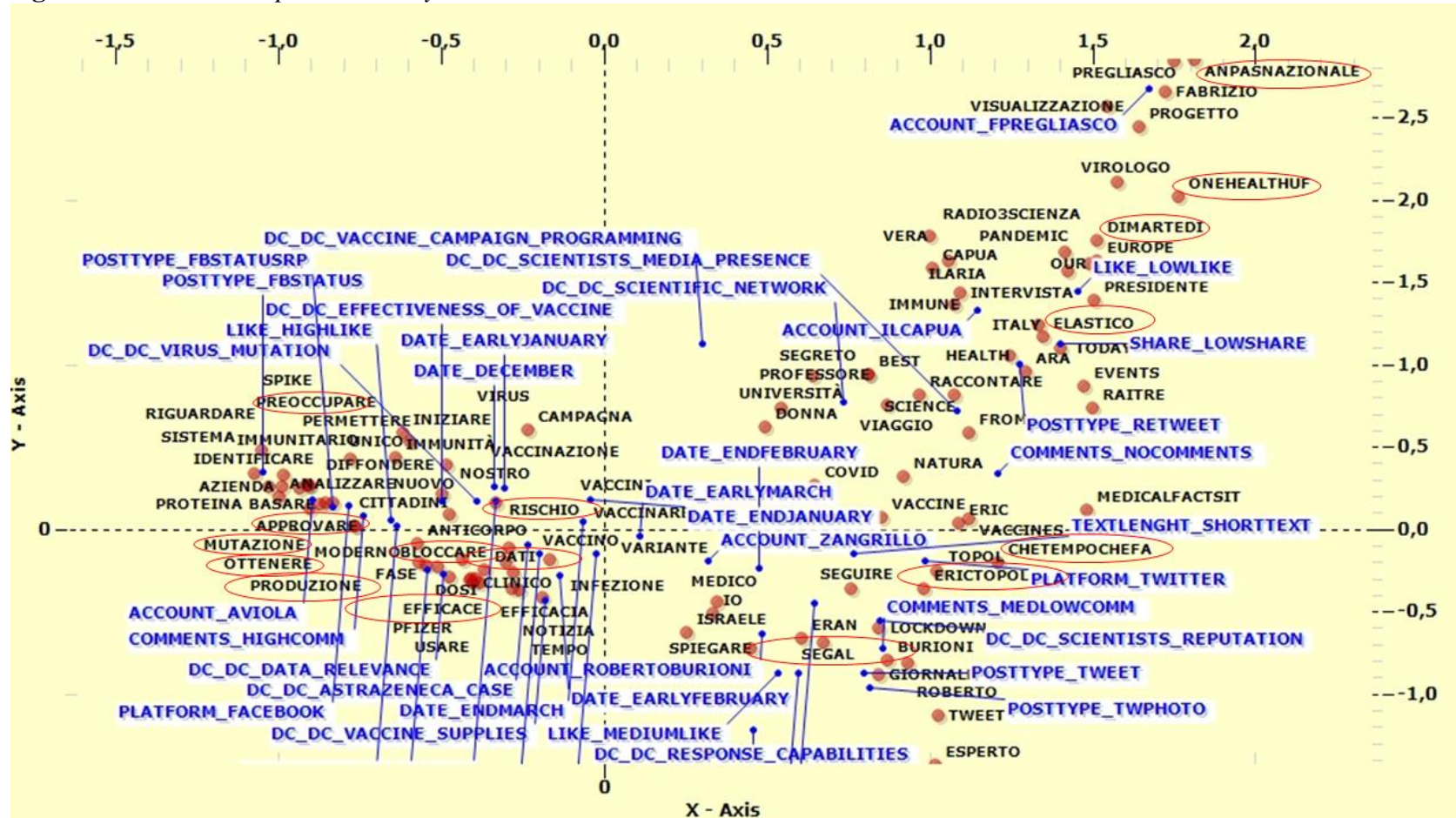
Antonella Viola seems to be the only scientist open to controversial discussion. Her position on plan, in fact, clears how she benefits from high reactivity by her followers instead of Ilaria Capua and Fabrizio Pregliasco, more oriented to quieter exposition about the vaccine argumentation, whose posts are in fact characterized by low likes, comments and shares. Lastly, Roberto Burioni and Alberto Zangrillo's communication is characterized by a medium degree of reactivity of his followers. By the way, we must point out that the scientist of *Istituto San Raffaele in Milan* closed the comments options to all his followers, even those for his "following accounts" or the ones he spontaneously refers by a mention in the posts or in comments.

The Lexical Correspondence Analysis (LCA)

After this first analysis procedure, we synthesized the information contained in our data providing the further explorative step of *Lexical correspondence analysis (LCA)* and show graphically the multiple correspondences between words and context elements as for example who spread the message and the platform by which has been uploaded (Figure 3).

Starting from the right side we can see a relevant mass media exposition of the selected scientists. On both the up-down side are indeed marked words as: *Dimartedì*, the TV program that hosts Iliaria Capua; *chetempocheffa*, the TV program that hosts Roberto Burioni every day at dinner time, duly complemented by the main character of their research network as; *One Health UF* and *Elastico*, the research centers and association tied to Iliaria Capua; *Eric Topol* and *Eran Segal*, two co-author scientist of Roberto Burioni; and *Anpasnazionale*, the association which Fabrizio Pregliasco is President. This content, posted over the timespan we observed and crossing the discussion introduction about the vaccine campaign, reflect how the positioned scientist in this side follow a kind of hybrid disintermediation made by *a social-mediatization process*. They, in fact, disseminate their statements via social media, originally conceived for mass media, finding on the web a new resonance chamber where the spread of the research outcomes is reluctant to react to Twitter's general public. On the other side, where the controversial discussion crosses the timespan observed, a dialogic strategy is applied by only Antonella Viola. The high engagement levels in fact remark an open possible discussion between the author and her public towards new scientific and mutable topics as the vaccines and its effectiveness due to the virus mutation as marked by words as: *risk*, *worry*, *mutation*, *production*, *effectiveness*, *data*, *lockout* etc. In this way, not relating with mass media frame, Antonella Viola looks as the only scientist truly according with a pure disintermediating process featured by contents thought specifically for the social media and the digital languages that promote a direct contact between sender and receiver, making outdated the figures deputed as intermediate in the communication processes.

Figure 3. Lexical Correspondence Analysis



Conclusions and Further Research Perspectives

This first exploration has finally shown how the most accredited Italian scientists set their public exposition related to the new media sphere. The main hybrid approach, followed by most of the scientists observed, can be related to several factors on which focus later for further needed deepening that must be planned also by continuing to follow the vaccination program and its communication trends held abroad. A further comparison between Italy and other European countries could be in fact useful to better comprehend these factors. More European countries such as France, Germany and the UK, in fact, frame the communication of science availing to few experts officially related to governments and institutional research agencies. In this way, the Italian framing turns out to be more liberalized in terms of contribution for the public scientific debate, suggesting that the distance from a pure disintermediated digital vocation could not only be related to the idea of Italy as a laggard country in terms of adaptation to the innovation in communication, while as sociopolitical context where arises a particular relation between science and politics. In this way, for example, we can wonder if the political sphere influences the scientific communication, scientists' interests, strategies and exposition styles related to this fundamental step fighting the pandemic.

Considering what has been shown, a further research perspective could be oriented on the base of the following hypothesis examples:

The social media use of Roberto Burioni seems to represent a resonance chamber of the framing processes he leads on TV, while Ilaria Capua adapts her twitter account as a promotion space, and her Facebook account as a press office managed by third people. Do they reject addressing controversial argumentation to protect their reputation and avoid troubles with the public broadcasting service? Does Pregliasco do the same to stay away from any ideological or political polarization misunderstanding of his government collaboration? Reading the *Science Reputation's* overall classification, Zangrillo has been qualified as the most contradictory scientist. Does he keep a low profile to avoid any other public embarrassment?

In conclusion, in light of this first exploration, it is evident that a more required deepening of the scientific communication frame worked during the pandemic era is needed, maybe starting from the above mentioned example-questions.

Moreover, since we are talking about a current and an in progress mutable phenomenon, we are forced to press further on our investigation following and observing the related events that feature the vaccination issue due to the multiple surprises and releases that the vaccinal program can reserve in terms of scientists' exposition in the public debate.

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A Mixed Content Analysis Design in the Study of the Italian Perception of COVID-19 on Twitter

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The digital era and the boom of social, user-generated and freely available and usable content on the Net has brought to the fore a classic technique, accused too often of being highly subjective and requiring a large amount of intellectual work. This technique is Content Analysis, which has seen an unprecedented explosion in recent years. In addition to the incessant flow, speed of diffusion and high volume of today's big data, the attention of social researchers – as well as of anyone interested in drawing information from this enormous proliferation of data – is shifting towards new possibilities. Among these we find that of having a notion of the contents conveyed, of the feelings expressed, of the polarities of big data, but also the chance to extract other information that indirectly speaks of the tastes, opinions, beliefs and transformations behind the behavior of the users of the Net. In fact, secondary data available on the Net, collectable through sophisticated query systems with API or with web scraping software, make it possible to accumulate huge amounts of this dense social data, from which it is possible to try to extract not only trends but real knowledge, in a quantitative as well as in a qualitative manner. This enriches the value of the results that can be produced with Content Analysis and limits, until disappearing, all the critical horizons that have classically left this technique in the shadows, allowing it to find new applicative dignity, validity and reliability (Hamad et al. 2016). In order to explain this evidence, the contribution that we will present attempts to prove that the return of Content Analysis techniques is not only due to the change in the scenario and in the data analyzed, but also to the ability of this technique to innovate and evolve, leading to open analytical perspectives beyond contingent changes. This can be demonstrated through the application of digital mixed content analysis to the recent COVID-19 outbreak and its development of the perception of the Italian population on a specific digital social platform, Twitter.

Keywords: *digital mixed content analysis model, digital platform social data, Twitter, Italy, coronavirus*

Introduction

Complex social phenomena that transit on the Net can be investigated with a technique that has found a renewed place on the social research scene just as big data is making its weight felt: Content Analysis. These phenomena require an epistemological and ontological translation into a multi-comprehensive approach like the Mixed Methods one. This means fitting into the debate introduced by Hesse-Biber and Johnson (2013), for whom “The exponential growth of ‘big data’, arising from newly emergent user-generated and streaming digital data from networking sites such as Twitter and Facebook, will place pressures on MM researchers to transform traditional modes of collecting and analyzing data

generated from these sites. [...] In the coming years, big data methods and analytics may also drive and challenge MM researchers to rethink and innovate and produce new paradigmatic perspectives and research designs and structures. In turn, MM perspectives and praxis can provide models for interpreting and deriving critical insights that that may give a more complex understanding of big data that can bring a set of new questions and understanding to the trending data currently extracted from user-generated social networking sites” (2013, p. 107).

This is the reason why new applications, new software and new algorithms are being developed, allowing the extraction of the knowledge nested into digital data. All the characteristics of Content Analysis in its qualitative (Schreier 2012) and quantitative (from its birth, Berelson 1952, to the present day, Riff et al. 2019) versions, the contaminations with text mining techniques and the continuous interconnections with network analysis or geographical techniques, are being recovered. This brings to the attention of the social researcher the continuous evolution of the cognitive horizon which allows access to this new digital frontier of Content Analysis, a frontier that has led to the breaking down of the boundaries between qualitative and quantitative approaches, as well as among different disciplines, leading to the birth of forced hybridizations.

It was precisely from these considerations that, given the emergency generated by the spread of COVID-19, with this study we wanted to focus on social data in order to investigate the online perception of one of the populations most seriously affected by this catastrophe: the Italians. Furthermore, we will apply an innovative model devoted to investigating the multivariate nature of social data: a mixed content analysis model born from the reflections in this paper.

The structure of the essay provides the first two paragraphs dedicated to literature review which describes the evolution of content analysis, particularly in relation to mixed methods and the mixed approach in the digital content analysis. The third deals with the methodology, illustrating the analysis techniques and the criteria for the construction of the dataset. The fourth presents the case study of COVID-19 pandemic disease in Italy. The fifth and sixth paragraphs concern the results: the fifth based on a combination of a Lexical Correspondence Analysis (LCA) and a Cluster Analysis (CA) about COVID-19 Italian's perception on Twitter, and the sixth relates to qualitative in-depth analysis of topic and social narratives. The paper ends with a paragraph discussing the results.

Literature Review

Content Analysis: Developments and New Scenarios

Previously used essentially for military purposes, content analysis assumed the status of a research tool in the 1950s after the publication of fundamental texts such as those by Lasswell (1949) and Berelson (1952). Content analysis has been defined as a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding (Berelson 1952, Krippendorff 2018, Weber 1990). According to Krippendorff (2018, p. 13) content

analysis is a research technique for making replicable and valid inferences from texts to the contexts of their use. Content Analysis has enabled researchers to sift through large volumes of data with relative ease in a systematic fashion (Stemler 2000). At the same time, the need to face the challenges posed by “old and new” kinds of data retrievable from the web has prompted those who move within the approach to borrow analysis techniques from other disciplines. Therefore, traditional techniques are being accompanied by non-traditional techniques (Herring 2009). In this regard, two main families can be distinguished in the so-called *web content analysis* (Herring 2009): *digitized methods and digital methods* (Rogers 2013).

Digital methods play a fundamental role in interpreting the evolution of Content Analysis. In general, digital methods can be considered as a set of research and strategy approaches using data produced in digital environments to study socio-cultural changes (Rogers 2009, Caliandro and Gandini 2016). These differ from *virtual methods* (Hine 2005), also known as *digitized methods* (Rogers 2009), paradigms that studying *reality* by adapting social research tools to the Web (for example, the online survey). Rogers (2009, 2013, 2015) was the first author discussing the structure of digital methods. According to Rogers, using digital methods presupposes epistemological choices. This implies knowledge about Internet and the context of the Web network not from an ontological point of view (an entity separate from reality, therefore an object of study) but as a method resource to study people’s behavior and social groups. The potentiality of this digital approach to content analysis does not exhaust its potential only in this paradigmatic shift. In fact, it is in the practice of analysis that many other possibilities open up; one is that of the possibility of fruitfully approaching integrated analysis models typical of Mixed Methods Research.

The Mixed Approach

According to Cipriani et al. (2013), talking about the possibility of using Mixed Methods means referring to the “possibility of adapting and coordinating between them more investigation techniques, more types of elementary information, or different paradigms or approaches of a theoretical or methodological nature” (2013, p. 272). In other word Mixed Methods research centers around researchers being able to collect multiple data using different strategies, approaches and methods.

The desired results of this mixture have the characteristic of being more than the simple combining of the single methods in order to generate grander and more integrated research outcomes (Orina et al. 2015). Many fields of research, with their characterizing methods and techniques, have already experienced the potentiality of the combination of qualitative and qualitative research approaches to pursue the guiding methodological principle of integration. Nowadays, it is not only a question of methodological principle that addresses social researchers, but also the ever-growing relevance of the kind of data used, the information contained therein, the possible multilayers of reality which they lead to, and the undeniable need for integration between these pieces of reality to build ever more complete paths of knowledge. It should also be noted that the crossing of the quantitative-qualitative

dichotomy is directly and indirectly supported by perspectives such as those of “live sociology” (Back and Puwar 2012) and of “punk sociology” (Beer 2014). They try to imagine, and direct to at the same time, the development of sociology in the digital world through new, even heterodox forms, compared to consolidated approaches. Furthermore, in a phase in which epistemologically naive approaches (i.e., data-driven) are being asserted, it is important for researchers to affirm their role by emphasizing the importance of facing a cognitive problem through complex approaches capable of giving better answers or to put it to better understand a situation (Creswell 1999).

The Mixed Approach in Digital Content Analysis

Using content analysis in the digital era in order to analyze digital content, such as that on social media, means being faced with old and new challenges. In the current research process, digital content analysis researchers must: formulate their cognitive questions and make the purposes of their analysis explicit; identify the source of the data and contents that they want to analyze; and then select them consistently to the delineated path. The analysis procedures, quantitative or qualitative or both, that they decide to adopt will depend on the hegemony of the research question (mixed methods perspective), but above all on the hegemony of the medium that conveys the contents taken into analysis (digital methods perspective).

Regardless of these considerations, the content analysis process will consist of the coding of raw data according to a classification framework. This framework, on the one hand, will, from the quantitative point of view, claim to extend and generalize the results. From a qualitative point of view, on the other hand, it will attempt to analyze the considered content more in depth. However, thinking that a cognitive question on complex data such as the digital platform social data can involve only one of these sides becomes an understatement. The Mixed Methods perspective is not only necessary, but in a certain sense mandatory.

In this regard, it is sufficient to think that already Holsti (1969), as well as the more recently retrieved claims by Schreier (2012) or Krippendorff (2018), stated that qualitative and quantitative content analysis are not discrete classifications, but rather fall along a continuum, a notion also used by Teddlie and Tashakkori (2011) to define the new horizon for social research methods in the light of the third approach, the mixed one. Stressing the approach along this continuum allows researchers to extract greater opportunities to gain insight into the meaning of data. Bryman (2012), on this possibility of moving back and forth in the approach, states that, by definition, “content analysis is a research approach that can be situated at the intersection of quantitative and qualitative methods, a place where both methods can meet and that quantifies and qualifies the manifest and latent meanings of the data” (Hamad 2016).

Combining this understanding of content analysis with a solid mixed-methods design could allow the researchers to reach the maximum result from the massive growth of digital texts and multimedia data. Of course, it is true that for researchers using data from social media platforms (e.g., Facebook, Twitter, LinkedIn or

similar) there are few guidelines for the collection, analysis, and evaluation of the various types of data.

Methodology

The cognitive interest that moves this study, in addition to demonstrating the return of Content Analysis in the digital environment, can be summarized in three specific research questions:

1. How has the spread of coronavirus directed, polarized and constructed the perception of the phenomenon faced by the Italian users of Twitter?
2. Which actors have been having the most pervasive communication impact on social perception?
3. What is the reasoning that built the social narrative of coronavirus on this social network? With the aim of finding adequate answers to questions so closely related to each other, as anticipated, a mixed content analysis design is required.

The research design at the basis of this proposal can be identified in the sequential nested model by Creswell and Plano Clark (2017). This model, which combines data collection and analysis of a secondary set of qualitative data in a traditional quantitative research design, has the main objective of strengthening the results obtained by integrating them downstream into the process.

It consists of a first quantitative extension phase with the application of an analysis on latency, or the Lexical Correspondences Analysis (LCA) aimed at pulling out of the original set of data the semantic dimensions of synthesis that can, at a later stage, lead to the application of a Cluster Analysis (CA) with T-Lab software aimed at identifying perception profiles of social users on the risk of coronavirus infection. Finally, a qualitative follow-up will help us to develop these results by building a concept map of actors, thematic areas, communication dimensions, and social narratives on the Covid-19 Italian's perception.

The results of the first phase were used to extract the axes or latent dimensions by LCA as the basis for a typology within which the groups obtained with the cluster analysis are projected as useful attributes for delineating the different emerging profiles. This new distribution of the emerging perception was also enriched by the kind of actors involved and their importance by their number of followers, and the level of sharing and engagement generated by the analyzed materials.

This technique also allowed us to extract the most characterizing set of tweets for each group or cluster retraced with the CA, an extraction that was used to implement a second in-depth qualitative phase of analysis within which we applied a thematic analysis focused on the hermeneutic interpretation of each set of tweets by theme in order to detect new information about the way in which the main differences in communication can be distinguished, as well as kinds and styles of communication, polarity, intensity and direction of the traced perceptions. For

each profile deemed relevant, 100 more significant tweets¹ (with in-group high value), were extracted and an in-depth treatment was started on them, which provided for the classification of the contents with the help of NVivo software and the creation of new attributes to be projected in the classification framework that gradually took form with the integrated results of the different quantitative and qualitative phases.

Furthermore, with NVIVO it was possible to reconstruct the maps of the emerging perception controlled on the basis of the arguments and the relationships that were generated among all these elements on the groups brought to the attention by quantitative analysis and this made it possible to also add a relational component, useful for understanding future developments and trends, to the produced framework.

In regards to dataset building, the hashtag extraction was supported by R extract tweet packages (rtweet) to locate current trends in digital content analysis on one of the most popular social media networks, Twitter, which made use of API to collect data. The data collection involved all the tweets about COVID-19 in Italian. It covered the period from March 5-15, when several important decisions relating to COVID-19 mitigation were made (DPCM 2020). Given the extension of the corpus and the limits relating to the API's Twitter (max 18,000 tweets per day), several daily extractions were carried out. The extraction keys were based on six hashtags, i.e., those that were potential or effective topic trends for the period in question:

- #coronavirusitalia and #coronavirus identify the main theme and, it is assumed, index a more popular and generalist communication on the theme (we could define it as knowledge-oriented);
- #iorestoacasa, #fermiamoloinsieme and #italiazonaprotetta could aggregate communication that was more interested in problem solving, i.e. about measures to reduce the virus risk (so this hashtag group we could call problem solving – oriented).

The final corpus consisted of about two millions tweets (including retweets). To facilitate mixed design, we decided to work on a more limited sample of 10,000 tweets (without the retweets) randomly extracted respecting the hashtag proportions related to: Tweet daily number and Hashtag groups (Figure 1).

The daily tweet percentages suggest that from the first day of extraction until March 11 there was a progressive increase in 'Covid' tweets. The most active days were those from 8 to 11 (on average with more than 10% of the daily tweets). The high number of tweets is plausibly connected to the implementation of important lockdown orders in Italy, first in the North and then throughout the country. March 11 (after Italy's lockdown) was in fact the day with the most tweets extracted (just over 13% of the entire body). However, there was a slightly decreasing trend after that date.

¹Significant compared to the groups emerging from the CA.

Figure 1. Overview Table on Population, Hashtags and Sample of Tweets

PROPORTIONAL SAMPLING BY N TWEET DAY AND HASHTAG QUOTES							
POPULATION and QUOTES				SAMPLE			
DAY	n tweets	%	#coronavirus #coronaviritalia	#iorestoacasa #italiazonaprotetta #fermiamoloinsieme	#coronavirus #coronaviritalia	#iorestoacasa #italiazonaprotetta #fermiamoloinsieme	n tweets
05-mar	61693	2,9%	100,0%	0,0%	288	0	288
06-mar	140002	6,5%	100,0%	0,0%	653	0	653
07-mar	198527	9,3%	99,8%	0,2%	924	2	926
08-mar	234441	10,9%	66,8%	33,2%	730	363	1093
09-mar	281869	13,1%	60,6%	39,4%	796	518	1314
10-mar	262421	12,2%	65,1%	34,9%	797	426	1223
11-mar	284753	13,3%	81,8%	18,2%	1086	242	1327
12-mar	141442	6,6%	69,1%	30,9%	455	204	659
13-mar	143571	6,7%	69,2%	30,8%	463	206	669
14-mar	206125	9,6%	81,7%	18,3%	785	176	961
15-mar	190204	8,9%	85,9%	14,1%	762	125	887
tot.	2145048	100%	77,4%	22,6%	7738	2262	10000

Source: elaboration on R on tweet corpus.

As the dataset was building, the automated extraction returned the tweet data related to 88 variables. However, we considered it sufficient to consider just 9 variables, i.e., those consistent with our research design. The 10,000-tweet dataset was built considering: *Display name*, *Verified account*, *Date*, *Time*, *Text*, *Text Width*, *Favorite Count*, *Retweet Count*, *User Followers* and *User Type* (built afterwards).

The *Display Name*, aka Twitter nickname, identifies the individual user and it is useful in defining users' classification.

Verified account is a useful variable for checking official accounts, such as media, opinion leaders, political organizations, etc.

The *Date* and *Time* temporarily place the tweet. The time is useful for specifying the daily range of the tweet, according to the classification: morning, afternoon, evening, night.

The *Text* is returned according to common Twitter standards which has just recently allowed users to exceed the standard 140 characters.

Favorite count, *Retweet Count* and *User Followers* are three quantitative variables discretized by five levels (quintiles). It is plausible to think of the first two as indicators respectively of the engagement and the sharing levels of the tweet content, while the third variable refers to the popularity of the user and its centrality in the communication arena of the network.

User Type variable was constructed at a later time to define a typology of Twitter user, by a multi-criteria and controlled classification considering the five variables previously seen, i.e., *Display Name*, *Verified Account* and quantitative variables (*Favorite Count*, *Retweet Count* and *User Followers*). The variable was coded according to six classes: 'Common User' (lowest level of sharing, follower and engagement value), 'Intermediate User' (second or third level of sharing, follower and engagement value), 'Influencer' (fourth level of sharing, follower and engagement value), 'Top user' (highest level of sharing, follower and engagement value); 'Political User' and 'Official Information media' (defined only by *Display name* and *Verified Account*).

These variables were included in the LCA analysis models as supplementary attributes to better describe the lexical patterns emerging from the textual contents of the tweets.

The Case Background – COVID-19 Pandemic Disease

A new coronavirus (COVID-19) was identified in Wuhan, China, in December 2019, declared to be a Public Health Emergency of International Concern on 30 January 2020, and recognized as a pandemic by the World Health Organization on 11 March 2020.

The Italian coronavirus cases surged from hundreds to thousands within two weeks, from a few hundred in the third week of February to over 3,000 in the first week of March, marking the biggest coronavirus outbreak outside Asia (only China and neighboring South Korea had had more cases). The infections in Northern Italy then rose and many other countries in Asia, the Americas, and Europe traced their local cases to Italy.

On March 8, the Italian government announced the lockdown of 11 Italian towns identified as the worst affected, including ten in Lombardy and one in Veneto (DPCM 2020). Within two days, the quarantine was extended throughout Italy (*iorestoacasa* decree) as COVID-19 cases were detected across the country. The quarantine period would depend upon how soon the number of new cases and deaths would decline. Italy was the first country to announce a nationwide lockdown following the Wuhan coronavirus outbreak.

In such a critical context, models of crisis and emergency risk communication (Beck 2000, Napoli 2007, Reynolds and Seeger 2005, Renn 1992) suggest that it is crucial to understand the perception of risk of the population and the sources of information that they trust to enable effective communication.

Although international and national institutional actors attempted to plan communication strategies for the correct information to mitigate disease, there was a high risk of a spread of fake news, overflow and bad information, especially what was shared on the main social networks (Vaezi and Javanmard 2020). Rumors and misinformation can undermine many public health actions and should be debunked effectively (Betsch et al. 2020).

In our case, the relevant hypothesis is that the spread of information through different institutional or non-institutional sources contributed to polarizing Italian user perceptions about the emergency, from excessive fear and concern to a total lack of interest.

Therefore, it is interesting to construct the main semantic categories of the perception and representation of the disease. In this way, it will also be possible to consider any relationship between the epidemic outbreak and the change in people's perception and feelings to try to improve institutional communication and safety-oriented policies.

Results

The Quantitative Multidimensional Exploration of the COVID-19 Italian's Perception on Twitter

In this paragraph a multidimensional analysis based on a combination of a Lexical Correspondence Analysis (LCA) and a Cluster Analysis (CA) (Benzecri and Benzecri 1984, Lebart et al. 1997, Greenacre 1984) was implemented. These are two techniques were used to reduce the space of mining contained in large sets of textual data as well as the dataset that we used for our analysis.

LCA, like all factorial analysis techniques, aims to extract new variables from the original matrix in order to summarize the information it contains. To understand which patterns represent the extracted factors it is necessary to understand which are the modalities of the variables/lemmas enriched by mining these factors in order to identify the concepts that account for the variability that they reproduced. It is for this particular characteristic of the used technique that we were able to extract two new synthetic dimensions of mining that allowed us to interpret the differences among the analysed content. The summary of the results of the LCA was achieved by performing the CA simultaneously, or on the new extracted variables. This technique regroups homogeneous elements within a set of data. In our case, CA served to group tweets characterized by a similar perception expressed with the use of similar words. These perceptions were identified thanks to the mining evidence that emerges from the LCA.

As mentioned above, the first result obtained with the application of the LCA is the delineation of two main synthetic dimensions of mining called factors. These factors can be crossed and used to build a new space of mining generated by this crossing. Figure 2 shows the crossing of these new dimensions, the meaning of which is built in the attraction and repulsion relationships among the active variables used for this analysis (type of user who posts the tweets, day on which they post and time slot and lemmas coming from the tweets text) that we used to describe the synthetized mining found on the new generated factors. Moreover, on the factorial plane obtained, there was also the projection of the cluster that we obtained through the application of a further statistical analysis on this dataset, the CA, which we will describe below.

The first factor is related to the opposition between the *private* and *public sphere* used as *direction of the expressed perception* in the analysed discourses. On the positive semi-axis, we find tweets mainly connected to the individual and private sphere. Here we have lemmas such as *aperitif*, *Netflix*, *home*, and *boring*, that clearly describe individual experience. Meanwhile, on the semi-negative axis we find the terms *health*, *Companies*, and *OMS*, which refer to the public sphere. The location of user types is decisive. The common user addresses the private sphere while all other users and, in particular political groups or official and administrative bodies, address the public one.

For the second dimension we found an opposition among the focus of the constructed discourses among the tweets. On the semi-negative axis, we found tweets that refer to daily limitations, medical issues, and social measures. Here we

experience. The name that can be attributed to this group is that of *perception in tension* between the most intimate and individual dimension and openness to collective experience.

In the second group which is at the crossroads between a dimension tending to collective-public openness and a propensity towards emphasizing the discourse focused on the health emergency, we find the users to be the local and national political-administrative class, the official information and the top users thus defined for their wide following. The tweets here are the ones with the highest resonance and are mostly centered on a popular narrative. The words relating to this group refer to the multiple aspects of the epidemic crisis: to the actors (such as civil protection, local political actors, institutions, etc.) to the measures (with the use of the words *ordinance, measure, closure*) and to the consequences on the population (such as *deaths, isolation, therapy*). This is a complex narrative that touches various key points of this pandemic precisely because it is the prerogative of the users deemed to be the most influential with afternoon messages that coincided with the circulation of daily update bulletins. It follows that the emerging type can be defined as *holistic perception*.

The third group explicitly refers to the need for support to the healthcare system with words like *support, hospital, and medical staff*. The reconstructed narrative is based on informed opinions about the emergency experienced from a healthcare point of view and a more individual concern weighs not insignificantly. The high information content of these tweets is also motivated by the fact that they are mainly from users believed to be the influencers and therefore able to act on the construction of individual perception starting from the conscious restructuring of the pandemic narration. The result is a *rationalist and consciously alarmist perception*.

The fourth group is the one in which a *strongly self-centred perception* prevails and is in fact moved to the more private and individual side of the first constructed dimension. Here we find the tweets that lead back to the effects on the private sphere of the pandemic. The type of user close to this group is once again the common user who launches a narration focused on everyday things (*Netflix, aperitif*), the experience of quarantine (*boring, new habits, new way of working from home*), the dimension of prayer and recrimination (*awareness, but also running away, selfishness*). These were mostly tweeted in the evening and at night, leaving a glimpse of a search for greater intimacy even in a digital dimension of communication and interpersonal sharing.

The fifth cluster mostly focuses on more general medical emergency issues and technical medical issues. Mainly they were tweeted in the morning as they processed and digested, and condensed the updates released the previous day with the expectations and new ideas for pandemic management in the new day. The result is a *pro-active soothing perception in risk management*.

Furthermore, the division into five groups was functional in paving the way for the development of the qualitative part of this study. For each of the five groups, after identifying the posts that made them up, the most representative 100 posts per group were extracted and, on these, a qualitative analysis with NVivo

was conducted on the emerging themes and on the social narratives that we will present below.

The Qualitative In-depth Analysis of Topic and Social Narratives of the COVID-19 Italian's Perception on Twitter

In the previous paragraph we dealt with the reduction of the semantic dimensions contained in the analyzed dataset, in this paragraph, on the other hand, will be dedicated to examining the emerging meanings in these semantic dimensions. This allows us to extract new information about the way in which to distinguish the main differences in the points made by users and emerging themes detectable from the set of analyzed tweets. Along with this, we will look at differences in the building of social narratives that emerge from changes in terms of communication type and style, sentiment polarities, intensity, and direction of the expressed perceptions.

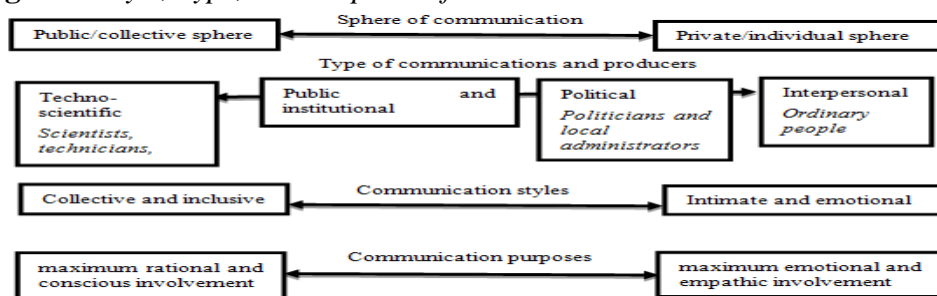
In order to do this, we applied a hermeneutic analysis starting from the classification made possible thanks to the obtained axes or synthetic dimensions of mining generated with the LCA. These dimensions contemplate a first opposition among posts devoted to highlighting the *private* or the *public sphere*, and we also give a connotation as *individual* or *collective horizon* in the perception of the spreading of the pandemic, and a second opposition among the importance assigned to the *social* or *health* dimension of the *emergency*. To reach the profiling of the thematic areas and the type of social narrative traceable among the analyzed short texts, we also considered a series of other dimensions in which it is possible to detect differences or graduations in the way in which these emerge from the texts.

The first kind of differences considered stay in the primary type of communication which gives an impression to the analyzed post especially by highlighting the kind of producer of the message. Most posts could be assigned to an *interpersonal communication* generally conducted by *ordinary people* who give an intimate and emotional connotation to the messages spread (i.e., # day10: *I look out the window and everything seems so unreal. The silence outside reflects the loneliness I live inside #istayathome*- common user). To the opposite side, another considerable number of posts can be attributed to *public and institutional communication* where the main producers are the *institutions*, giving the messages an openness to the collective and the possibility of keeping together the attention focused on very different spheres involved in the pandemic (i.e., #doyourpart *Defend yourself and defend others, wear a mask, keep a distance of one meter and limit the outings to those strictly necessary* - institutional user). This openness and dynamic are also attributable to another kind of detected *communication*, the *political* one, used by politicians and local administrators that at the same time sometimes overlap the intimate and emotional connotation of the *interpersonal communication* (i.e., close to everyone's experience #togetherwe willmakeit - political user). The last difference could be traced in the *techno-scientific communication* mainly the prerogative of *scientists, technicians, and experts* both in health and in socio-economic measures aimed at curbing the crisis connected to the spread of

the pandemic (i.e., *the search for antibodies for a vaccine continues* #thesearchdoesnotstop #covid-19 - technical user - i.e., *the government is working hard, proposals are being examined to address the socio-economic impacts of this pandemic* - expert user). It follows that these types can be positioned along the continuum between private/individual and public/collective spheres. Therefore, we start from interpersonal communication until we gradually open up to different gradations of collectivity and inclusiveness. Still, along this dimension another continuum is stressed, the one that has the *purposes of the type of communication* as extreme, on the one hand aimed at the *maximum emotional and empathic involvement*, on the other hand aimed at the *maximum rational and conscious involvement*.

Graphically, we could represent that as follow.

Figure 3. Style, Type, and Purposes of Communication

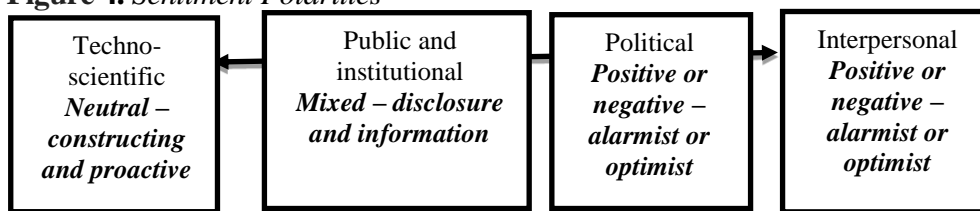


Source: our elaboration.

However, the analyzed posts can also be distinguished on the basis of the *polarity of sentiment expressed*. Although it is possible to identify the extremes of *negative* and *positive*, along this dimension we are not faced with different expressed gradations, but with *different combinations of intensities* in which either polarization is totally canceled, and therefore they are defined as *neutral*, or the polarities combine with each other, we will therefore define them *mixed*. In the text analyzed, if we could assign the neutrality connotation to techno-scientific and public and institutional communications which, on the other hand, are characterized by typical traits of disclosure and information in a constructive and proactive prospective, the mixed connotation is generally assigned to public and institutional communication that share the same traits, intended to be neither alarmist nor optimistic. The extremes of positive and negative are found in the styles of political and interpersonal communication, deliberately more marked and polarized than the other types of communication (i.e., #unitedbutdivided *this pandemic will teach us so much* - common user - *still hundreds of deaths* and #Conte *continues his dictatorship of imprisonment and terror* #businessandpolitics - common user).

Following the generated continua, another one could be produced:

Figure 4. Sentiment Polarities



Source: our elaboration.

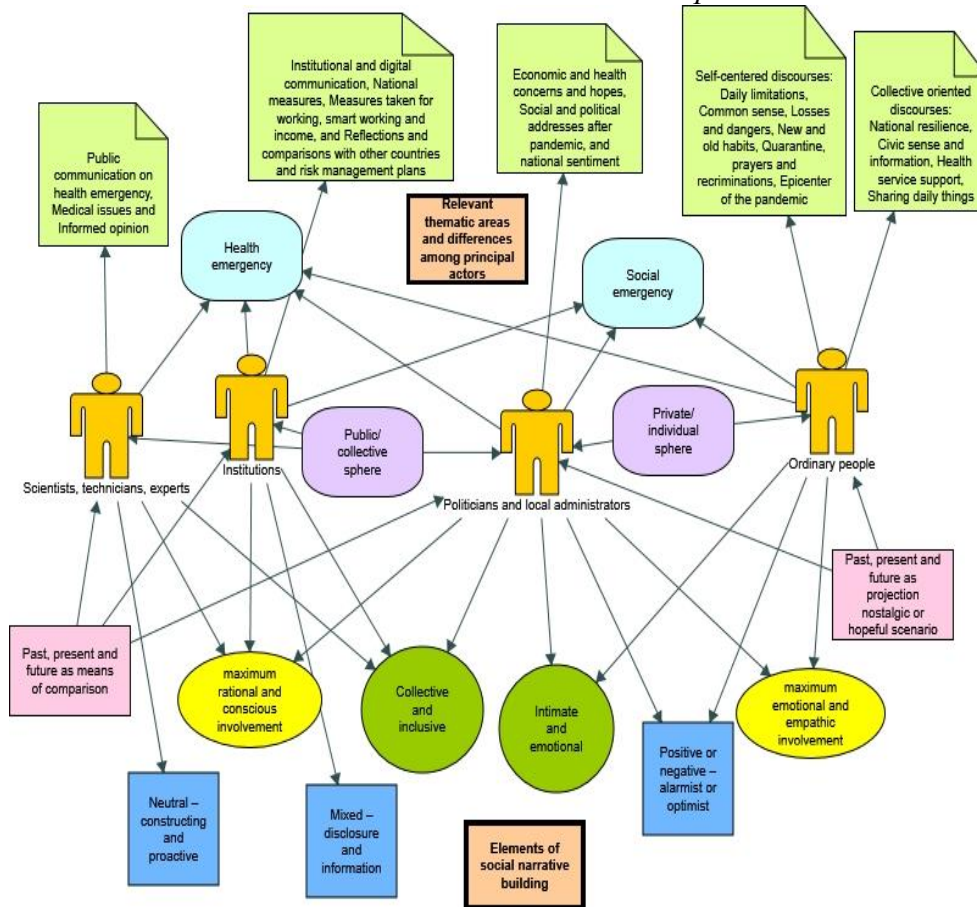
As far as the *direction of the expressed perception* is concerned, a continuum can be identified in the projection made in the discourses in terms of referring to *past, present* or *future*. The reference to the past is more typical of technical-scientific and institutional discourse, aimed at a comparison between what happens in the present and how things have been dealt with and managed in the past (i.e., *will the Ebola vaccine case help in the fight ahead of us today?* - media user). But it is also a typical modality of interpersonal discourse, as it conveys the perception of the present to an anchorage with the past and to that refined return to normality that is typical of the past (i.e., *another friendless day, another empty day #ridemebacknormal* - common user). Experts, institutions and politicians refer to the present to comment on measures and situations, but also ordinary people in concentrating the narratives on how the pandemic is experienced here and now (i.e., *the first effects of the containment measures are starting to show ways out #everythingwillbefine* - media user). On the other hand, if scientists and institutions look with analytical rationality, politicians and ordinary people project hopes and expectations on it (i.e., *the dawn of a new day #restiamoumani* - political user).

The same trend holds the *focus to which the discussion refers* and highlighted as the second dimension of LCA synthesis: the focus on the *social* or *health* dimension of the *emergency*. Whether they are ordinary people, politicians, institutions or experts/scientists, each sphere touched by the emergency is metabolized and returned in the narratives of all the actors involved in different ways and with different intensities. Therefore, unlike the previous ones, these dimensions cannot be stretched along a continuum, but rather belong to the type of topic discussed. And this opens our qualitative analysis to the identification of the thematic areas connected to the characterizations of the discourse and narratives analyzed above.

The main thematic areas that can be traced in techno-scientific communication are: *Public communication on health emergency, Medical issues* and *Informed opinion*. These all belong to the health emergency especially in its impact on the population. The aim is the production and the spread of knowledge among all sectors of society.

The thematic areas most closely connected to the public and institutional communication are: *Institutional and digital communication, National measures, Measures taken for working, smart working and income, and Reflections and comparisons with other countries and risk management plans*. The topics run among social and health emergency concerns. The main aims are seeking answers, reasoning about future impact and activating awareness and responsibility in a population that needs to be better informed and adequately trained.

Figure 5. Concept Map of Actors, Thematic Areas, Communication Dimensions, and Social Narratives on the COVID-19 Italian's Perception



Source: our elaboration with NVivo software.

The political communication thematic areas, on the other hand, are: *Economic and health concerns and hopes, Social and political addresses after pandemic, and national sentiment*. Also in this kind of communication the topics run among social and health emergency concerns. But this time the main aims are to limit the damage, to active involvement due to the weight of the situation experienced and to build moderate confidence in the future.

Two kinds of thematic areas are more determinant in interpersonal communication. One is more self-centered and the other more collective-oriented. Falling in the first are: *Daily limitations, Common sense, Losses and dangers, New and old habits, Quarantine, prayers and recriminations, Epicenter of the pandemic*. These are more recriminatory, outburst and negative discourses, more passive, characterized by the terror of the unknown, where the citizens are drifting at the mercy of events. Instead, in the second thematic area we find: *National resilience, Civic sense and information, Health service support, Sharing daily things*. These are proactive, support and positive discourses in which it is possible to glimpse a path for the way out. Here the discourse is focused on contingent activities as well as on the future perspectives projected towards returning to normal, focused on the

understanding and respect for the rules imposed in a moratorium but proactive way. The dimensions of solidarity and support are determinant.

Before projecting all these characterizations in a general framework of classification suitable for integrating all the results obtained from the quantitative and qualitative phases of analyses, we are now able to synthesize the relationships found among all the recalled dimensions in a concept map.

Discussion and Conclusion

The last step that remains to be done in this analysis involves the integration of the results obtained. With the quantitative procedures, the synthetic dimensions of meaning traced with the application of the LCA have been identified. In order to create a basis for integration, a space of attributes was developed (for example of the conceptual matrices of Calise and Lowi 2010) that crosses these two dimensions, and on this the other elements traced with the other quantitative and qualitative analyses have been projected (see Figure 6).

The horizontal axis shows the contrast between the directions and the projections of the discourse on the *public/collective sphere* on one side and on the *private/ individual sphere* on the other. Instead, the vertical axis represents the opposition in the focus of the speeches, on the one hand on the *social emergency* and on the other on the *health emergency*. In summarizing the terms of the discourse in this way, it is possible to understand which are the *prevailing narratives* for each quadrant obtained using both the groups of perceptions elaborated with the CA and the elements of the construction of the narratives according to the actors who produce them as attributes.

In the upper left quadrant where there is a focus on *health emergency* with prevalent openness to the *public sphere*, the prevalent narrative is the *collective and inclusive narrative*, which emerged during the in-depth analysis of the issues. In this space of meaning two groups of actors with their perceptions can find space. *Politicians* with their proposal for a predominantly *holistic perception*, as well as *ordinary people* when developing their discourse collectively orienting it towards a *corporate perception*.

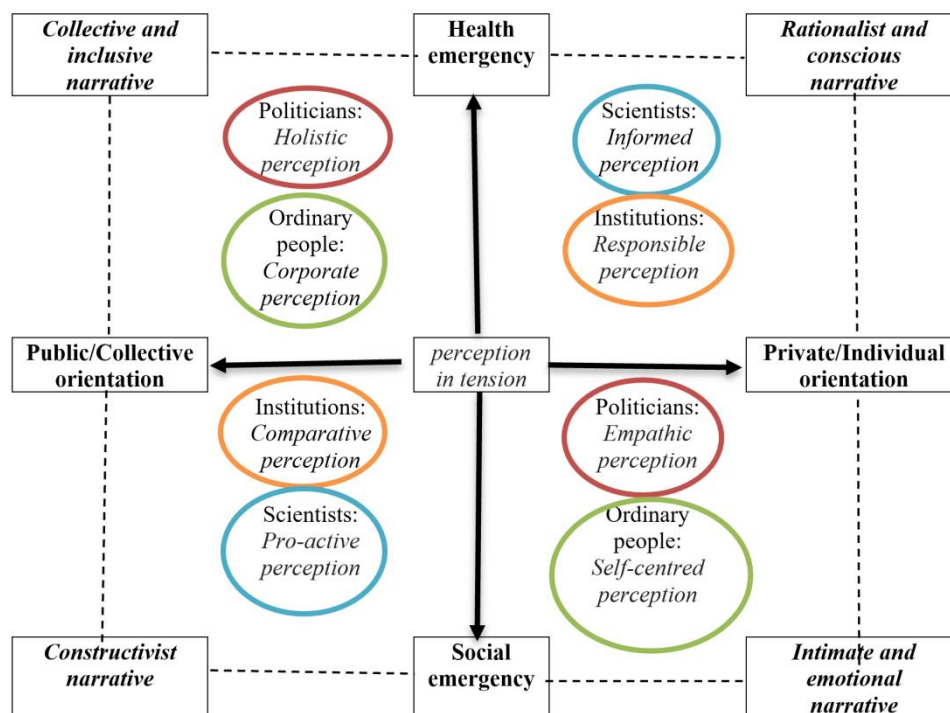
In the upper right quadrant, which sees the cross between a focus on the *health emergency*, this time addressing a *private and individual sphere*, the prevailing narrative is the *rationalist and conscious one*. In this space of meaning we find the *scientists* who propose an *informed perception* and the *institutions* that propose, instead, a *responsible perception*.

In the lower right quadrant born from the cross between a focus on the *social emergency* and discourse oriented towards the *private/individual sphere*, we find a predominantly *intimate and emotional narrative* that is the prerogative of two groups: the *politicians* who propose themselves as representatives of the people, offering an *empathic perception* with each individual, and *ordinary people* who give the most intimate expression of their experience by presenting a self-centred perception instead.

In the lower left quadrant that crosses, once again, a focus on the *social emergency* but this time with openness to the *public and collective sphere*, a *constructivist narrative* prevails. The groups that fall into this are mainly the *scientists* with their speeches focused on a *pro-active perception* in the resolution of the emergency, and the *institutions* that offer reasoning and delineation of future scenarios through a *comparative perception* with other countries, situations and types of emergencies.

As far as research limitations and further developments are concerned, obviously it is necessary to reflect on many points in order to validate the proposed framework, however it is assessable here for its power of theoretical synthesis to restore the vastness of the results in extension and in-depth – qualitative and quantitative – produced for this study. In particular, we will show this result as a way of integration and visualization of results coming from a *sequential nested mixed content analysis design*, capable of accommodating qualitative and quantitative outcomes and allowing a certain order in the reasoning and interpretation of the – almost always complex – phenomenon chosen as a case study. All this awareness that we are reflecting on refers to a particularly delicate phenomenon whose evolution and impact are ongoing.

Figure 6. *Integrated General Model of Classification in the Italians' Perception of COVID-19*



Note: On the axes lie the synthetic dimensions that address social discourses, in the corners the type of narrative, in the quadrants the main actors with their perceptions developed in each specific attribute space.

Source: our elaboration.

To help the reading of such a complex reality, our method proposal can be conceived as a starting point that opens up to new reflections and future developments, continuing to refine the results that can be pursued on both the research paths outlined and on the possibility of their increasingly precise integration. This is because the main research limit lies in the ability to balance the idiosyncrasy of qualitative choices in the pursuit of the extreme objectivity of the qualitative side. Although we tried to manage this feature, it remains a congenital characteristic of the approach to be implemented ontologically, pushing the pragmatic vocation that substantiates the approach and the possibility of presenting a study with the characteristics of the one carried out in these pages.

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Value-based Communication during COVID-19 Pandemic: A Study on the Twitter Messages of Turkish Ministry of Health

Seda Mengü, Murat Mengü & Kemal Günay

Influencing the whole world by obliging people to change their daily practices along with their relations and assume different life styles, COVID-19 has brought about some likely deleterious effects in Turkey as well. Undoubtedly, it has caused disturbance and even panic in social and psychological sense. In such cases of uncertainty and panic, communication with the public should be clear, explicit, alleviating and to some extent, guiding. People can be guided and convinced more easily if the level of distress and uncertainty decreases. Such a way of governing and compelling communication consists of different directions, requirements and combined effort. If co-operation is appropriately based on values, this process will be much easier. To that end, public discourse during the outbreak of the pandemic in 2019 was as successful as it was based on the daily life and language of society. Noteworthy, there are similarities between value-based collaboration and governmentality. Policies, customs, patterns and guidelines help maintain control and guidance over collaboration. At this point cooperation acts as a matter of participating in language games that build social and organisational realities that are created, debated, distributed and changed by means of mutual action and cooperation. The purpose of this study is to analyse the messages sent by the Ministry of Health during the pandemic in Turkey via social media, particularly Twitter, in order to find out to which extent these messages encompass the features of value-based communication. Thus, discourse analysis and descriptive research model are going to be implemented together. More specifically, the first tweet in which Corona was first referred was sent on January 25, 2020 and from then on 505 Tweets were posted. For the discourse analysis, 100 tweets that have received the most interaction are going to be used. As for the other descriptive analyses; on the other hand, all 505 tweets are going to be utilized in cluster analysis.

Keywords: *value-based communication, discourse, social media, pandemic*

Introduction

COVID-19 pandemic, which has produced dramatic consequences all over the world including Turkey, has also brought about some psychological and behavioural problems along with biological ones. What has spread is not only the virus but also some psychological disorders triggered by social trauma, such as excessive phobic reactions, depression, panic and paranoia as well as disruptive behavioural disorders, for instance selfishness, impulsivity selfishness, aggression and stigmatisation. In extraordinary situations people may temporarily lose their ethical values such as common sense, empathy, co-operation etc. and turn to an egotist creature. That is why, the psychological atmosphere created by pandemics spread faster than the virus itself and affect even those who have a low risk of

catching it. Hence, a pandemic brings along an intrinsic psychological state. It can be considered as an aggression proved by the fear of death. Individuals who have become apprehensive and selfish tend to get rid of the ones who pose a threat and guarantee their well-being. Another problem that is observed in epidemics and pandemics is stigmatisation. Major cholera and plague epidemics throughout history have been collective traumas for humankind. Therefore, people have always been scared of such epidemics and thus, tended to ostracise and even eradicate the patients. Although the attitude today is not so cruel, it can be suggested that the respective COVID-19 has caused some sort of stigmatisation.

COVID-19 has also caused some harmful effects in Turkey by bringing about disturbance and even panic in social and psychological sense. In such cases of uncertainty and panic, communication with the public should be clear, explicit, alleviating and to some extent, guiding. People can be guided and persuaded more easily with regard to the increase or reduction of anxiety and ambiguity. Such a leading and persuasive communication consists of various rules, regulations and collaborations. In value-based collaboration, this process will be managed more easily. Thus, discourses towards the public during the outbreak of pandemic have been performed to maintain value-based collaboration. This approach has proved to be successful as it has been based on daily life and the language of society. According to Foucault (qtd. in Jørgensen 2004) value-based collaboration as a new form of governance resembles governmentality. Collaboration is controlled and guided by a set of rules such as procedures, traditions, norms and standards. Moreover, collaboration functions as a matter of participating in language games through which social and organizational realities are structured (Adolpsen and Norreklit, qtd. in Jørgensen 2004, p. 87). In other words, organizational and social realities are formed, negotiated, shared and changed through interaction and collaboration. In fact, collaboration enables people not only to communicate, but also maintain mutual understanding and perform daily life practices (Silverman and Jones, qtd in Jørgensen 2004). Value-based communication generally consists of being people oriented, quality, participation, sustainable communication, trust, transparency, conformity with ethical standards, continual research, susceptibility to needs, qualitative and quantitative as well as continuing education etc.

One of the two significant concepts in this study is value-based collaboration. Thus, with regard to the pandemic, whether or not value-based collaboration has been achieved and people have been led effectively with the language used is examined. In accordance with value-based collaboration, the second important concept is value-based communication. Within the context of this study, the main criteria and sub-categories of value-based communication have been determined as follows:

I. Main Criterion: Governance

- a) Participation of stakeholders into the process/katılımcılık.
- b) Clarity.
- c) Transparency.
- d) Accountability.

II. Main Criterion: Trust

- a. Providing continuous information/feedback.
- b. Giving Priority to Quality/Quality in Healthcare.
- c. Reciprocity.
- d. Dialogue.
- e. Interaction.
- f. Assuming Responsibility.
- g. Conformity with Ethical Standards.

III. Main Criterion: Actions Pertaining to People Oriented Health Care:

- a. Meeting the Needs.
- b. Qualified Health Care Personnel.
- c. Quick Response.
- d. Early Diagnosis.
- e. Research (developing vaccination etc.)
- f. Providing education to patients, doctors and whole society about the pandemic.
- g. Value Based on Distribution: Equal Distribution of Resources to All Patient Groups.
- h. Technical Value: Optimum Output with Available Sources.
- i. Personal Value: Proper Care for the Fulfillment of Patients' Expectations.
- j. Social Value: Contribution of Health Services to Social Participation and Connectedness (European Union 2019).

All in all, the purpose of this study is to analyse the messages sent by the Ministry of Health during the pandemic in Turkey via social media, particularly Twitter, in order to find out to which extent these messages encompass the features of value-based communication. Thus, discourse analysis and descriptive research model have been implemented together. More specifically, the first tweet in which Corona was first referred was sent on January 25, 2020 and from then on 505 Tweets were posted. For the discourse analysis, 100 tweets that have received the most interaction are going to be used. As for the other descriptive analyses; on the other hand, all 505 tweets are going to be utilized in cluster analysis.

Literature Review

Value-based Communication During the Pandemic Process

In this study, a review was carried out on whether the nature of messages sent by the Turkish Minister of Health to communities through Twitter was in accordance with value-based communication. First of all, the main and sub-criteria of value-based communication have been determined and the concepts and

discourses that set these criteria have been analyzed. Social media's new community creation and community management issues are important here. Social media is one of the tools used to gather people together around specific issues and get them moving in a certain direction. Social media has become one of the new social capital building tools.

As Szecsi and Koller (2017, p. 18) stated, the essence of social capital of community is the trust among individuals which enables a community to accomplish more with individuals' physical and mental capacities than they can achieve alone. In other words, social capital of community can be considered as an ability of individuals to cooperate for common communal objectives, which is influenced by social interaction and communication, relations of trust, communal norms and values. In this way, social networks of the individuals are formed.

Social media, as a social network area, also provides a share of various norms and values. Messages sent through Twitter during the pandemic process are created to increase the ability of individuals to collaborate for common goals in society. Discarded messages are aimed at demonstrating the importance of pandemic, what needs to be done, the risks, the measures that need to be taken, and motivating their cooperation on communities.

It is claimed that the best communities are indeed the hybrids of physical and virtual communities (Etzioni 2001, Haythornthwaite and Kendall 2010, qtd. in Szecsi and Koller 2017, p. 20). In these new, hybrid forms of communities, virtual communities enhance physical communities. In this context, the boundaries between real and virtual forms of communities gradually get obscure, and individuals regard their virtual community as real. In the digital age, the function of communication as value-based in virtual communities also functions to create physical communities as well (ibid).

In a study conducted to find out the immediate impact of the Covid-19 pandemic on mental health and quality of life among local Chinese residents aged 18 and older in Liaoning Province, mainland China, Zhang and Ma (2020) circulated an online survey through a social media platform between January and February 2020. Participants completed a modified validated questionnaire that assessed the Impact of Event Scale (IES), indicators of negative mental health impacts, social and family support, and mental health-related lifestyle changes. Zhang and Ma have concluded that the Covid-19 pandemic was associated with mild stressful impact in their sample, even though the Covid-19 pandemic is still ongoing.

A new type of coronavirus (COVID-19) has caused physiological as well as psychological and behavioural problems. Bahadır (2020) lists the effects of the global epidemic on the psychology of individuals as follows: "An individual's personality, age, socio-economic-cultural level, skills to cope with stress, values, philosophy of life, etc. depends on many factors. Fear of illness and death are the primary factors during an epidemic where uncertainty prevails. People are worried about the illness along with the death of themselves and of their relatives. They also want to maintain their strength, graduate from school, make a living and protect themselves from getting sick. Naturally, anxiety may increase if solutions to these issues are not created, for example, if they are furloughed in this process.

Unnecessary and inaccurate information can increase anxiety and fear. A new lifestyle has begun to emerge, especially due to the processes of staying home. Needless to say, human is a social being. For this reason, the sense of restriction and isolation caused by lockdown can make one feel emotionally under pressure. Other factors that cause anxiety during the pandemic can be reduced by practising the following:

- To be informed about the correct sources of disease and virus protection.
- To learn and apply what needs to be done about hygiene
- Unnecessary and inaccurate information can increase anxiety and fear.
- Accessing the right information sources and making use of them.
- Limiting the time spent on social media.
- Creating a daily routine may bring about the feeling that life continues in its normal course. Sleep, nutrition, work, etc. schedule can be designed. However, if trying to comply with this program is also a problem, a more flexible program can be created.
- To make phone calls and video chats with relatives, family and friends who cannot be seen because of social distance. Hence, people can have the feeling that social life continues in another form.

As we see, the negative psychological effects of pandemic may appear. According to this we can see that informing people constantly, about hygiene, and sharing the information about pandemic cases and treatment methods and results help reduce public anxiety. In addition, since everyone is isolated in their own home in this process, presenting thoughts that will encourage people to cooperate and act together and create common feelings and motivation among people reduces social uncertainty and anxiety.

Important effects of a pandemic are the curfew and isolation of people. People feel lonely at home and alienated due to diminishing social interaction. Apart from the reactions to the epidemic, the responses to uncertainty and the ability to cope with stress, depending on the personality structure, person-to person, age (child-young-adult-elderly), socio-economic and cultural situation, etc. can also vary depending on many other factors.

A common behavior we see in outbreaks is that we move away from rational solutions and quickly believe some myths spread through social media. Hearing unscientific comments and information pollution can cause a lot of fear in humans. Therefore, people should be informed frequently by the authorities. Repetition of the measures, the rational dimensions of the Corona virus outbreak, and the high morale of people are extremely important for success. These problems are leading all individuals and communities to the atmosphere of risks to which they cannot be immune and that they cannot foresee and control in any way. During this crisis caused by the pandemic, it is essential for governments and state institutions to manage the discourse and actions, viewpoints of events and ways of directing the society, which are very important for them to effectively manage the crisis process. At this point, the concept of value-based collaboration emerges.

Understanding cooperation means understanding how members use the language to share specific things. Organizational reality is thus created by using these language games. Understanding cooperation also denotes understanding the life structures of people inside organisations and how they influence the way members address and solve problems as well as how they are generally involved in organisational life (Jørgensen 2004, p. 88).

Wittgenstein's concept of language games suggests that the positions, interests, intentions and strength of language games are described using Foucault's concept of power (Foucault 1978, 1979 qtd in Jørgensen 2004, p. 86). When used from a critical point of view, it is useful to emphasize how a certain change in discourse creates problems, methods and solutions that contain some specific ideas about who people are and why they think and do what they do (ibid). In Wittgenstein's conception, languages become a part of life and doing things essentially a part of everyday life. The meaning of language is understood by the work that the language is doing in social life.

According to Ethics Resource Center, value driven activities are defined by guiding principles, mission statements, moral standards for leadership, motivating people for value commitment (qtd in Wieland 2005). During the process of the pandemic, the Turkish Minister of Health explained the principles and rules necessary for circumventing the pandemic and stated the rules and duties that each individual should do and follow individually on his Twitter account. In this process, he put forward the motivations that enable people to act together in cooperation with each other without alienation and invited people to contribute to the circumvention of the process. In this sense, we can see the performance of a value-driven activity. Society is a system like an organization and social practices are carried out within this system. Like many others, Turkey is a society that makes collective decisions and reveals it through collective discourse and practices with a related self-structure. In such a cultural structure, people do not become alienated from each other. For example, the various slogans put forward during this pandemic are; "stay at home," "we are good enough for us" etc. These statements have led people to act together. All in all, physical isolation was attempted to be overcome with emotional and intellectual integration.

Groddeck (2010, pp. 70–71) discusses that all social systems encompass certain communication operations or rather the interconnection of communication events over time. The term "system" is employed to display how certain social formations are generated, which are stabilised by mutual relations, feedback and self-management processes.

The term *value* has a long tradition in sociology, philosophy and economics. It grew very prominent at the end of the 19th century, when early sociologists used it to discuss the question of societal integration. Because of an increasingly differentiated society with a less clear structure, the question arose as to what the society was holding together. The answer was seen in moral, social and cultural values, not in religious beliefs, as it was in the pre-modern society (Durkheim 1973, Parsons 1960, qtd in Groddeck (2010, p. 72). Talcott PARSONS formulates: "Values in this sense are commitments of individual persons to pursue and support certain directions or

types of action for the collectivity as a system and hence derivatively for their own roles in the collectivity."

Values are not considered a fundamental condition for individuals or social entities that affect effectiveness. These are empirically observable forms of communication that show values only as invisible aspects of individuals or social entities and are evaluated as values by empirical applications, for example, by referring to corporate values, ethical standards, value learning programs to improve leadership skills, or just expressing the values, beliefs and drivers of managers. A specific phenomenon as a form of value communication is perceived as an operational solution to an operational problem in the organization. From a systemic theoretical point of view, the relationship between problem solving is based on the need for survival of the system that is organized here. If we ask for a function of value communication, the task will be dealt with by addressing value communication with the application and dealing with a specific reference issue and the phenomenon of value communication. The uncertainty of solving a complex organization and its surroundings can be treated as semantics through value communication. Values are an environment in which organizations can inevitably cope with the uncertainty that creates the synchronisedness of a large number of enterprise operations (ibid, pp. 74–76).

Value-based communication should be addressed more in the context of healthcare within the scope of this study. In this context, we should first define value in the context of value-based healthcare.

The concept of "value-based healthcare (VBHC) is getting more commonly used in public debate and the notion of "value" is frequently considered as "health outcomes related to realised inputs." Nevertheless, two important aspects must be taken into account (European Union 2019):

1. European healthcare systems are based on the concept of solidarity. The Charter of Fundamental Rights of the European Union and the European Pillar of Social Rights secure universal access to affordable, preventive, curative and good quality healthcare in the EU.
2. There is no single definition of 'value' within value-based healthcare. The definition of value is subjective and what is considered valuable can differ between patients, clinicians, healthcare providers, policy makers or industry stakeholders.

In order to meet the challenge of ensuring the financial sustainability of universal healthcare and finding the resources to finance innovation, it is essential to switch resources from a lower value to higher value healthcare. The Expert Group proposes a comprehensive concept based on four value pillars to define "value-based healthcare" to convey the guiding principles of solidarity-based healthcare systems (ibid, p. 1).

Allocative Value: Equitable distribution of resources across all patient groups.
Technical Value: Achievement of best possible outcomes with available resources.
Personal Value: Appropriate care to achieve patients' personal goals.
Societal Value: Contribution of healthcare to social participation and connectedness.

Value-based healthcare can be used to inform when deciding and contributing to the streamlining, availability and resilience of healthcare systems. Initiatives have now been undertaken to address the following areas:

- Reallocation of resources: Disinvestment for reinvestment Unwarranted variation defined as 'variation in the utilization of healthcare services that cannot be explained by variation in patient illness or patient goals'.
- Fighting corruption, fraud and misuse of public resources.
- Increase public value in biomedical and health research.
- Regulatory policies for better access to high-value (but costly) medicines
- Incentives for fairer distribution and more optimal use of resources (ibid, p. 1).

The Expert Panel (*Expert Panel's Recommendations*) understands the redistribution of care from low to high value as the highest necessity for sustainable and resilient European health systems. A long-term strategy is recommended to achieve a cultural shift that allows for the release of resources to re-invest in high-value care and to effectively redistribute towards value-based health care, with a strong management system.

- Develop a long-term strategy for a step-by step value-based approach towards change of culture. This strategy should encompass the definition of a series of goals that support the long-term objective of change, moving forward in small steps (work plans), including the implementation and monitoring of effects by use of existing data sources and methodologies as well as the creation of mechanisms to further guide the direction of change towards high value care.
- Support Research & Development on/of methodologies on appropriateness and unwarranted variation by exchanging robust methodologies for measuring and monitoring patterns of clinical practice, regional variation, appropriateness research, by stimulating data collections (incl. real world evidence and big data) and by defining and aligning goal-oriented outcomes that matter to patients.
- Encourage health professionals to take responsibility and feel accountable for increasing value in healthcare, which may require freeing resources from low-value care to reinvest in high-value care encompassing the training of "change agents" (leaders) that feel accountable for the health of the population, including equitable distribution of resources across

diseases. Health professionals hold a key role in advocating a change of culture towards social cohesion and connectedness.

- Support the creation of Learning Communities, including communities of health professionals, to bring together the best expertise, experiences and practices, contribute to change of attitudes and to learn from each other by measuring, benchmarking and implementing actions across the EU. Member States should take the lead in identifying and pinpointing the most important tasks, the EC should create a supportive and facilitating environment for the establishment of those Learning Communities that will contribute to a change of behaviour and a change in legislation.
- Support initiatives for patients' engagement in shared decision-making, recognising the importance of patients' goals, values and preferences, informed by high quality information to implement empowering practices and goal-oriented person-centred care (ibid, p. 2).

Community Building Function of Social Media in the Context of Twitter

Developments such as the spread of the internet, the ability of individuals to interact and produce their own content on the internet have had important effects on the structure of communication. With the digitalization, changing the production, distribution, display and storage facilities of the media and transferring cultural products to the digital environment affect culture; transform all stages of communication. Trends such as increased interaction with social networks and the ability of the user to contribute to content production have not only led to the emergence of new forms of communication, but have also affected the consumption and production patterns of traditional media. In this context, Lev Manovich states that new cultural forms are emerging and cultural forms such as photography, television and cinema are being transformed and redefined. The ability of internet users to produce content in virtual environments, to share their comments, opinions, as well as the traditional media's one-to-many communication structure, have enabled the development of communication structures between peers, from one person to one, from many to many (Ateşalp and Başlar 2015).

Henry Jenkins (Jenkins and Deuze, 2008) defines the change in communication environment through the concept of convergence. The phenomenon of convergence in the communication environment is more than just a technological change; it is a complex process with economic, global, social and cultural dimensions. Jenkins uses the concept of convergence to define content streaming across multiple media platforms, to collaborate across multiple media industries, and to immerse viewers who can migrate anywhere. Convergence points to a cultural shift that encourages consumers to seek new information and to make connections between scattered media content.

As a result of the rapid developments in computer technologies and communication networks, the internet has become an indispensable part of our lives. The process, which we call the technological paradigm by Castells (2008), radically changes almost every aspect of our lives such as economy, politics, social

relations, and culture. The technological paradigm has revolutionized almost everything in the context of time, space and relationships, and it has created new patterns of perception and relationship. This transformation that the technological paradigm has revealed in social structures and movements has led to the expression of the society we live in as a "network society". This type of society, which is referred to as the network society, has started to transform the society structures by spreading to a very large part of the world very quickly unlike the previous society types (Castells 2008). The internet, which was used only as a means of getting information and accessing information for the first time, has become a social communication tool with the widespread use of websites such as Facebook, Twitter, etc. which have been defined as social media, and continuous communication at home, at work, on the street in short, almost everywhere where human beings exist. It created a virtual society. The relationships and actors envisaged by the classical sociology for the social structure have now started to change size and function (Köseoğlu and Al 2013).

While social media has an increasingly larger place in social life, it is also important for brands, non-governmental organizations and politicians. Brands, non-governmental organizations and politicians use social media for public relations. However, social media is considered as a public space and politicians use social media as a communication tool within the framework of public relations. Political parties, leaders or candidates generally use social media tools in order to provide information, increase voting rates by affecting voters' behavior, preferences and decisions, create resources, create information networks with internal and external groups, and increase political participation.

Methodology

Purpose

This study aims to analyze the reflection of the communication strategy concerning the global COVID-19 crisis, utilized by The Turkish Minister of Health, on the discourses on Twitter. This analysis will be based on Value-Based Communication. In addition, word relation matrix and cluster analysis were performed using data mining methods.

It should be pointed out that the healthcare communication about COVID-19 has been managed and thus the data shared by the Minister of Health all by himself. Therefore, there has not been a secondary data sharing or pronouncement about the respective pandemic by any other government organisations or institutions.

At this point, it might be helpful to provide brief definitions of description, analysis and interpretation. Firstly, description is highlighting what the data collected indicates and what results it produces according to the research question. Analysis; on the other hand, is uncovering the themes and meaningful relationships between these themes that are not seen directly in the data set through conceptual

coding and classification. Descriptive analysis consists of four stages (Yıldırım and Şimşek 2018):

1. Creating a framework for descriptive analysis.
2. Processing the data according to thematic framework.
3. Identification of findings.
4. Interpretation of findings.

The question of "what a particular utterance or observation indicates" draws up the main function of interpretation. In data analysis, meaning comes to the fore. Highlighting the meaning depends on the interpretation of the findings within their environment (ibid). Furthermore, Miles, Huberman and Saldana (2014) categorise the four the components data analysis as; data collection, data display, data condensation and conclusion: drawing / verifying.

According to the visual analysis approach; collected data is summarized and interpreted according to the previously determined themes. Data can either be edited according to the themes put forward by research questions or may be presented by taking into account the questions or dimensions used in interview and observation processes (Yıldırım and Şimşek 2018). Moreover, discourse analysis is the examination of the language in use, which is an approach to the analysis of any semiotic event (Gee 2014).

Limitations

Twitter API has some restrictions on pulling data from user profiles. One of the restrictions is that it can only receive 3200 tweets per day. Another limitation is that some tweets in the date range can be skipped during this process. Although the study universe has 505 tweets in this research, this number may be different for the reasons mentioned above.

Universe and Sampling

In this study, it is determined that the first tweet by the Ministry of Health regarding Covid-19 was posted in 25.01.2020. It was seen that 505 tweets were posted during this process. Purposeful sampling method was used to measure the Value-Based Communication of the Ministry of Health. "Purposeful sampling allows for deep study of situations that are considered to have rich information" (Yıldırım and Şimşek 2018, p. 118). In the "Value-Based Communication" analysis of the study, the first 100 tweets of the Minister of Health that had interaction were taken as basis and the codings were made through these tweets. The parameters used in the interaction of tweets are specified as: "retweetCount = count of retweets" and "favoriteCount = count of likes". The interaction rate was determined by taking the arithmetic average of these parameters. The tweets that had the most interaction are revealed utilizing the formula below.

$$\frac{\text{retweetCount} + \text{favoriteCount}}{2}$$

Interaction Rate: 2

All of the 505 tweets were used for the word proximity matrix and cluster analysis on the discourses of the Minister of Health on Twitter. Descriptive research model (Yıldırım and Şimşek 2018, p. 239) was used as the method in the study. Mixed research designs are also included in the research by using qualitative and quantitative methods together. A Twitter Developer Account was created to obtain the data. An API (Application Programming Interface) was acquired from Twitter to obtain the data. All tweets were obtained using the RStudio program via the API. With the same program, tweets were converted into data frame/tibble data format and made ready for analysis.

The purpose of this discourse analysis is to highlight the hidden content that is not visible at first glance. During the analysis, evaluations were made over the words that came to the fore according to the frequency ranges of the words. In this analysis, in cases where the same word differs by taking a suffix, they are combined as a single word. In addition, synonyms have been subjected to the same process.

Codings were performed on the NVivo 11 Pro program. The coding process was carried out manually by the authors of the article. Firstly, for the coding reliability, each researcher performed an individual coding process on the related data set. Pre-coding on the data set was evaluated by all researchers, and a specific coding system was created. In order to ensure the validity of the coding process and to reduce errors, the message classifications are set to certain standards. Content not relevant for the study is excluded from the coding process. All operations, analysis, and data visualization techniques, except for coding on text with NVivo, were done with the RStudio program.

Text mining is another approach used in this study. Text mining can simply be defined as the process of producing structural texts that contain information from large amounts of unstructured texts. In order to reveal meaningful expressions with the processing of texts, some steps such as data preprocessing and feature extraction should be performed. After these stages, the non-structural data are converted into a structural format for the use of the text mining method. In this way, meaningful information in large amounts of data is tried to be revealed. By using these meaningful data, various results can be reached that institutions or organizations will benefit from. Mathematical and statistical methods are on the basis of text mining methods. Text mining is also used in different areas such as author recognition, text classification, idea mining, emotion analysis, keyword extraction, natural language processing, title extraction, and relationship rule extraction (Kılınç et al. 2016).

In the study, text processing and analysis were done with the RStudio program. The text mining library included in the RStudio called "Text Mining Package" or "TM" was used. The following text mining processes were applied respectively. Converting data into a corpus, equalizing the text size (tolower), removing punctuation marks (removePunctuation), removing numerical expressions

(removeNumbers), removing expressions such as conjunctions and prepositions (removewords stopwords: 'Turkish') -when clearing these words, a dictionary appropriate for the language used should be selected-, removing internet links (removeURL), removing unnecessary words as deemed by the author in accordance with the study (removewords), combining words that can mean the same to one word (e.g., İstanbul and İstanbul'da), and removing word spaces (stripwhitespace). Finally, with the "TermDocumentMatrix" function, a term-document matrix has been created for the data set received from the tweets. In this matrix, all words are converted to values 0 and 1 and network diagrams of words are created. Finally, cluster analysis was performed with the "cluster_fast_greedy" algorithm in RStudio.

Results

Top 100 tweets of Health Minister with the most interaction regarding Covid-19 were examined. In total, 782 codings were carried out. These codings include three main categories of Value-Based Communication and their sub-categories. The main categories are "trust", "person-oriented health actions" and "governance". The "trust" category has 7 sub-categories, "person-oriented health actions" has 10, and "governance" has 4 sub-categories. There are 21 sub-categories in total.

In the codings made according to the expressions on Twitter (Table 1), it was determined that there were 266 codes in the "trust" category, 337 codes in the "person-oriented health actions" category, and 179 codes in the "governance" category. In this value-based coding, it has been determined that expressions about "person-oriented health actions" come to the fore with 43.1%. Secondly, it was revealed that the expressions about "trust" were at 34.0%, and finally the "governance" category at 22.9%. As we can see, person-oriented health actions take precedence, and the qualifications that should be in people-centred care are as follows: social value, meeting needs, informing patients, doctors and public about the pandemic, qualified health workers, rapid intervention, personal and technical values, distribution-based value and research.

Table 1. *Main Categories*

Features	Frequency	Percent (%)
Trust	266	34.0
Person-Oriented Health Actions	337	43.1
Governance	179	22.9

The other important element that emerges is governance. In this respect, governance value is part of the value based management which offers a holistic solution to achieve performance, focusing on three core components:

- The main objective of maximising value through the implementation of sustainable strategies.

- The management of the value which focuses on factors related to the attainment of the primary objective, factors relating to management, organizational culture, communication, relations with the external economic.
- Social and natural environment; Performance assessment system indicators that reflect the creation of value (Oane et al. 2015, p. 107).

The third important finding is an element of trust. In other words, building trust between management and the public is significant. Here are seven tips for managers to build or rebuild trust introduced by Sabatier (2014, pp. 3–5):

1. Take an inventory of your trustworthy behaviours.
2. Act with integrity.
3. Admit mistakes.
4. Straight talk: do not avoid difficult conversations or feedback; people have the right to know what you think.
5. Be approachable.
6. Right wrongs and go the extra mile.
7. Hold people accountable: People need to understand the benefits and consequences of their actions or lack of them.

Firstly, when looking at the "trust" factor (Table 2), the prominent features are "continuous information" with 9.3% and "reciprocity" with 9.0%. (The numbers were shared daily with the daily number of cases in order to prevent a crisis and panic in the public.) The next features that were determined are, "interaction" with 5.9% (interaction with the scientific board, patients, artists' posts about COVID-19) and "assuming responsibility" with 3.7% (the minister of health assumed responsibility for the problems that arose). The least common "trust" features among the content used by the minister on Twitter were found to be "prioritizing quality" with 1.9% and "compliance with ethical standards" with 1.5%.

In the second factor, "person-oriented health actions" category, the most dominant features are as follows: "social value" with 10.7%, "meeting needs" with 8.3%, "informing patients, doctors and the public about the pandemic" with 6.6% and "personal value" with 6.1%. Other distributions emerge as "qualified health workers" with 2.6%, "rapid intervention" with 2.3%, "technical value" with 1.9%, "early diagnosis" with 1.5%, "distribution-based value" with 1.5%, and "research" with 1.4%. As seen, person-oriented health actions, social value, meeting needs and informing patients, doctors and the public about the pandemic as well as personal value emerge as the prominent factors. In this context, within the scope of the statements made on Twitter, it is seen that the expectations and needs of the public are taken into account and that the functions performed are fulfilled in accordance with these expectations and information is given. This indicates a necessity to enhance the capacities of hospitals, to acquire new technical tools needed, to increase the number of beds and breathing apparatus, and to provide continuous information about pandemic.

In the last factor, the "governance" category, the sub-category distribution rates are determined as "openness" with 31.8%, "participation of stakeholders in the

process" with 30.7%, "transparency" with 29.1% and "accountability" with 8.4%. The distribution of categories and sub-categories is shown descriptively in Figure 1.

Table 2. Sub-Categories

Features	Frequency	Percent (%)
Trust		
Dialog	21	2.7
Compliance with Ethical Standards	12	1.5
Interaction	46	5.9
Prioritizing Quality	15	1.9
Reciprocity	70	9.0
Assuming Responsibility	29	3.7
Continuous Information	73	9.3
Person-Oriented Health Actions		
Research	11	1.4
Distribution-Based Value	12	1.5
Early Diagnosis	12	1.5
Informing Patients, Doctors & the Public About the Pandemic	52	6.6
Rapid Intervention	18	2.3
Meeting Needs	65	8.3
Personal Value	48	6.1
Qualified Health Workers	20	2.6
Social Value	84	10.7
Technical Value	15	1.9
Governance		
Openness	57	31.8
Accountability	15	8.4
Participation of Stakeholders in the Process	55	30.7
Transparency	52	29.1

Figure 1. Content-based Communication Categories

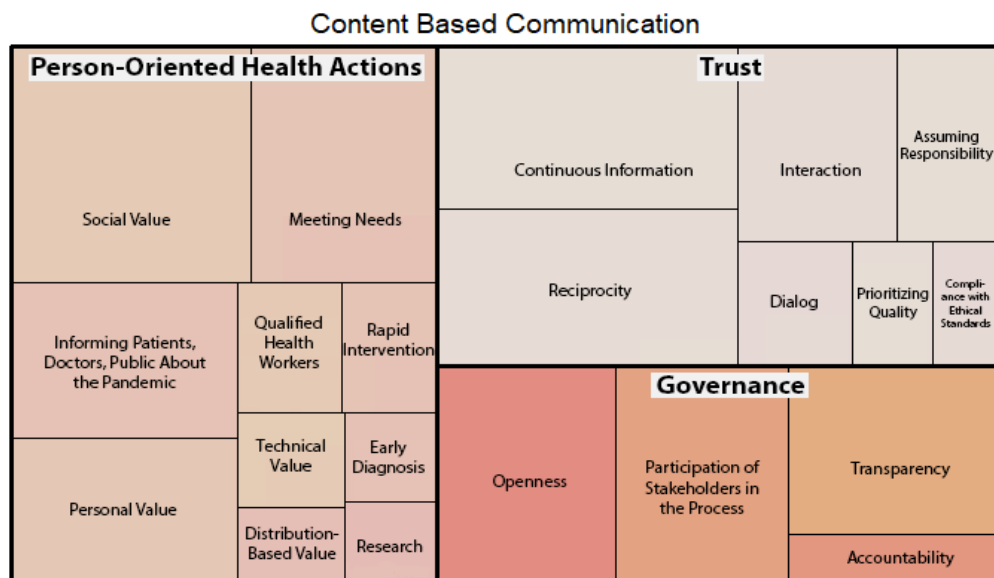


Figure 2. Word Relationship Matrix based on the Twitter Discourse Analysis of the Turkish Minister of Health about COVID-19

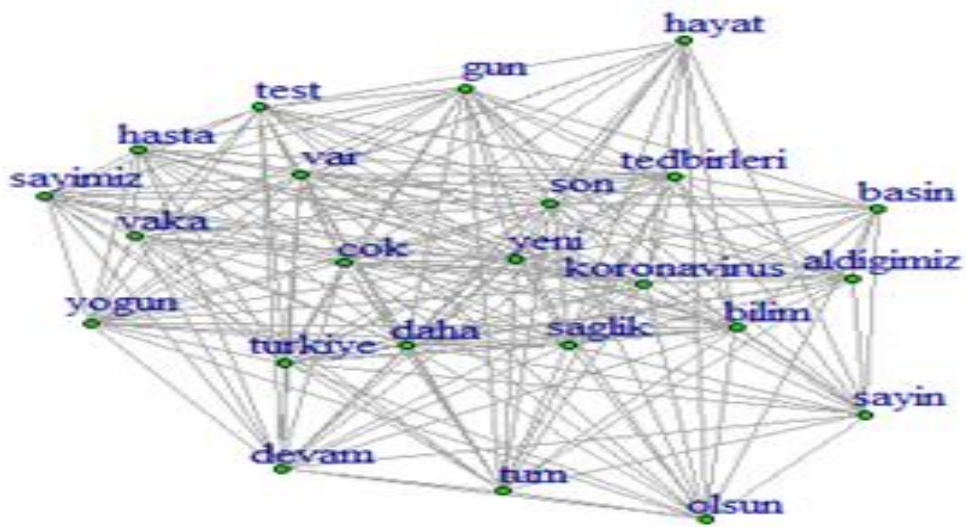
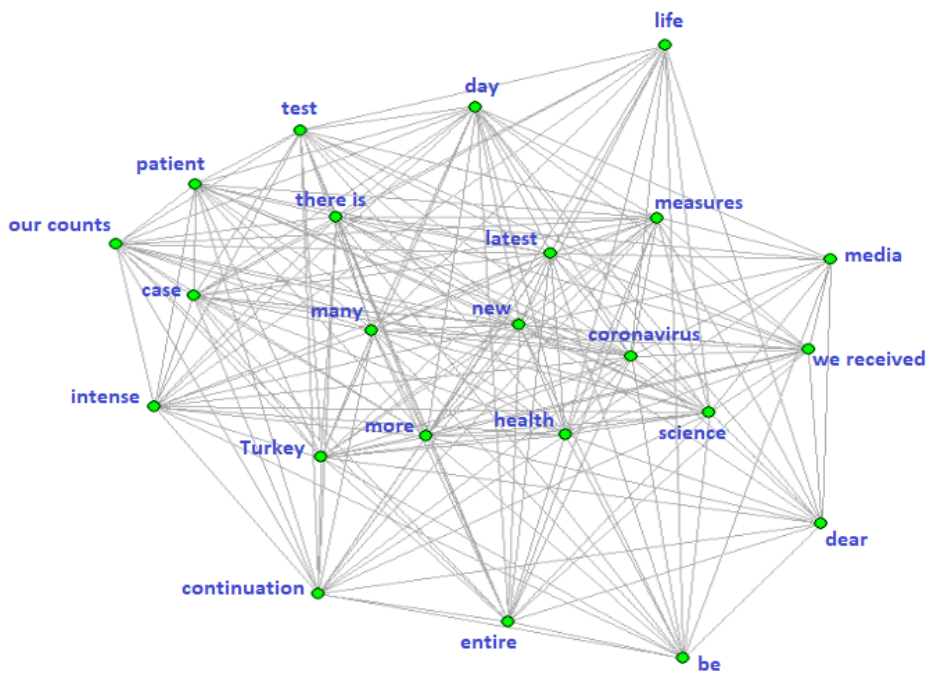
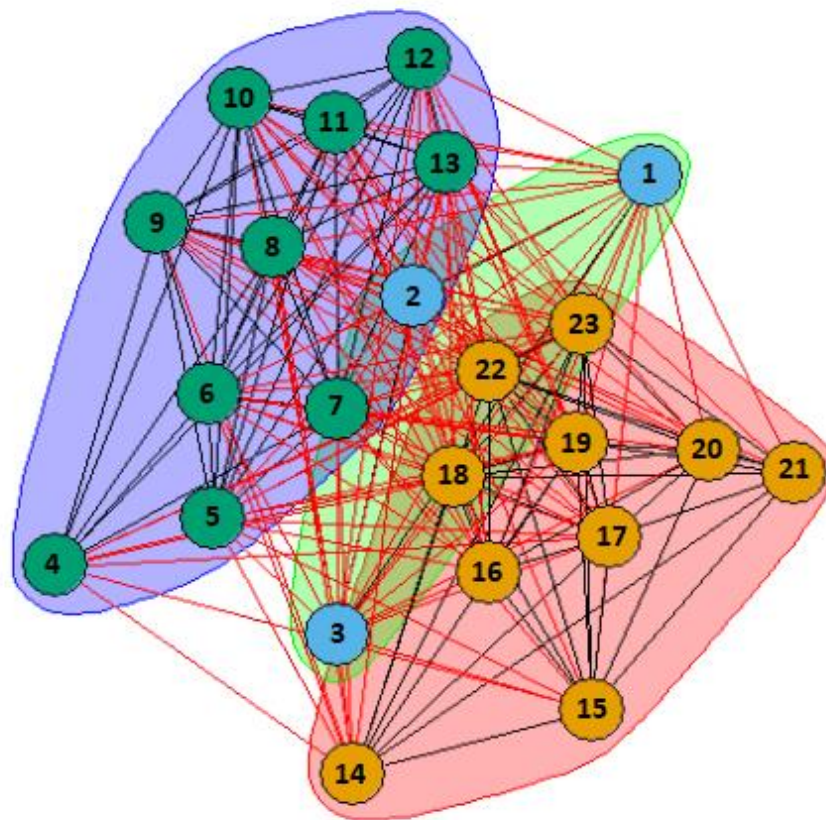
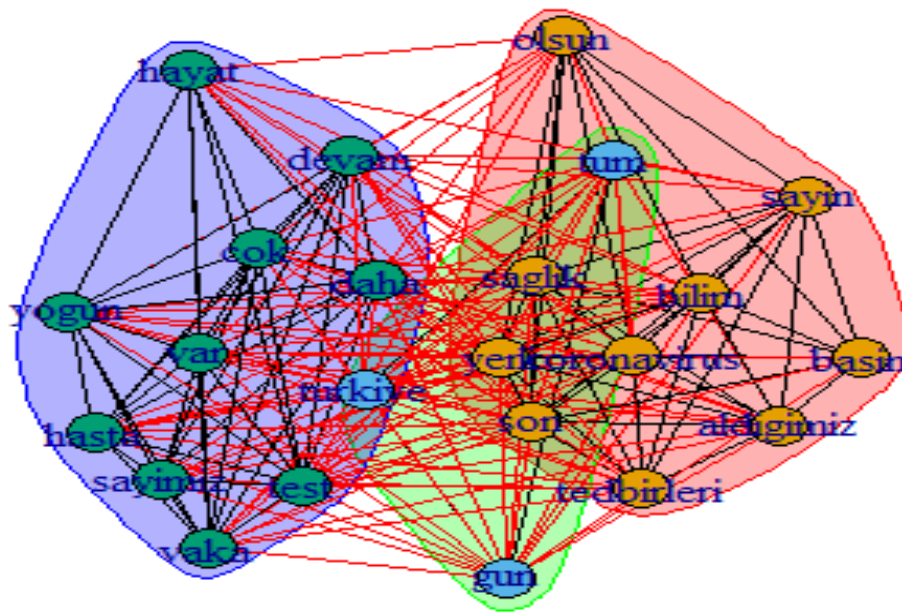


Figure 3. Cluster Analysis based on the Twitter Discourse Analysis of the Turkish Minister of Health about COVID-19





Blue

- 1- Day
- 2- Turkey
- 3- All

Green

- 4- Life
- 5- Continue
- 6- Many
- 7- More
- 8- There is
- 9- Intensive
- 10-Case
- 11-Patient
- 12-Number
- 13-Test

Yellow

- 14-Let there be
- 15-Dear
- 16-Precautions
- 17-Science
- 18-Health
- 19-Coronavirus
- 20-The (precautions) taken
- 21-Media
- 22-New
- 23-Last

Discussion

Leaders try to create some behavior in the audience with the way they communicate, while trying to create understanding and relationships with the target audience. There are elements such as mutual dependence, satisfaction, empathy and trust in this relationship.

Satisfaction with communication seems to be more associated with communication focused on tasks such as relationship-based communication, because task-oriented communication is immediately rewarded by executing a task. As people focus more on remote communication than for personal communication, it is expected that, compared to communication to building relationships, communication focused on tasks shows a greater impact on satisfaction with communication (Marshall and Novick 1995, qtd. in Kang et al. 2017). Successful communication affects cooperation. Task-oriented and relationship-building communication consists of interdependencies, joint management and satisfaction with communication (ibid, p. 5).

Moreover, Bennis and Thomas (2002, pp. 1–2) maintain that leaders create a sense of events and relationships that would otherwise go to waste without them. Even if the leaders are bothered by experience; they are not considered helpless and are not considered paralyzed. They look at the same events that encourage those less capable and happy, and see something useful and often a plan of action. An important part of our leadership model is what lies on the other side of the crucible-qualities that define lifelong leaders and learners. One of the main advantages that all our leaders share, whether young or old is their ability to adapt. The ability to process new experiences, find their meaning and integrate them into a person's life is the ability to designate leaders and truly anyone who finds ways to live fully and well.

On the other hand, Stein et al. (2013) assert that there is still a large transformation of people-to-human care services: the lack of clearly defined and measurable objectives, consistent communication strategies or participatory approaches in the development and implementation of integrated care are only a few shortcomings that can lead to partial shortcomings that may give way to optimal results or current challenges with a view to sustainable and large scale efforts. Ensuring implementation throughout the system often prevents ambiguous stimulus structures, the lack of suitably trained professionals and/or obsolete legal frameworks.

Quality movement and ergonomic movement have many basic similarities, such as the basic values on which these movements are built. The keywords shared between them are; "Human needs, expectations, requirements, comfort, health, happiness and satisfaction" (Axelsson, qtd in Bäckström et al. 2014, p. 59).

Furthermore, as Bäckström et al. (2014, pp. 61–62) indicate, communicative leadership can be defined as openness, accountability and continuous dialogue with communities. Communicative behaviours of leaders encompass four aspects: "structuring, facilitating, relating and representing" Furthermore, engaging communities in dialogue, actively sharing and seeking feedback, giving importance to participative decision making.

Within the scope of this study, it can be stated that through Twitter, the number of pandemic-related deaths, the number of positive and negative issues, the developments in the health prompt, comparative rates of cases with different countries, treatment methods applied, research on vaccine, etc. have constantly been emphasized. In the same way, the issues such as openness, transparency and reliability have been stressed.

Conclusion

The beginning of pandemia communication is March 11, 2020, when the first COVID-19 case was announced, as in measures and combat. The Minister of Health has come to prominence in the disclosure of the measures taken since then and informing the public about developments in COVID-19 cases. It has been the right choice of communication on behalf of the government to assume that the Minister of Health is predominantly in the name of the government to announce

information about pandemic to the public. The Minister of Health initially began making a statement from his Twitter account towards midnight, making the number of cases and deaths public (Türk tabipleri birliği - COVID-19 pandemisi iki aylık değerlerdirme raporu, p. 54).

Health care workers were applauded by the public every evening at 9 pm to support health care workers during pandemics and to create a respect and appreciation for their service. In this way, it has been positive for providing moral support to health care workers. It has been through Twitter to receive this support from the public.

Daily statements about pandemics, which are regularly performed by the Health Minister, have become more organized since March 27, 2020. The tweets, which he went through towards midnight, were replaced by a press conference two days a week after science board meetings and table statements covering information such as new cases, test numbers, recovery and deaths (p. 55). It can be suggested that the health minister, as a leader, managed the pandemic crisis with appropriate communication within the general action plan.

It should also be mentioned that the communication carried out by the Minister of Health is generally a task-oriented communication. The Ministry of Health's communication via Twitter has been made to the idea of which words are most used, the relationship of words to each other and in which clusters they are gathered within the context of idea mining. This review is based on the main criteria and sub-criteria of value-based communication. In the network diagram analysis (Figure 2), it is aimed to show the relation density of the words with each other. The center of this network diagram is created by "health", "coronavirus", "science", "new", "end", "measures", "case", "have" and "Turkey" words. It is determined that other words are used frequently together with these words in the center. It is seen that the other words associated with the words in the center are, "life", "test", "patient", "our number", "intensive", "continuation" and "day". Finally, it was determined that the word matrix created in the cluster analysis (Figure 3) is divided into three clusters. It is seen that these clusters are in parallel with the three basic categories of Value-Based Communication. Lilac colored area can be said to represent the main category of "trust". The words "patient", "test" and "our number" match with the category of "continuous information". Rose color, on the other hand, can be said to be closely related to "person-oriented health actions". The words "we take", "measures", "coronavirus", "science", "health" can be interpreted together with "social value", "meeting needs", "personal value". It can be said that the green color is representing the "trust" main category with the words "all" and "Turkey".

There is also a similarity between the elements of value based communication and the elements of quality management value. Considering all these respected elements, we need to have a management approach that meets communicative leadership features.

It is seen that communication activities performed during the pandemic are carried out in accordance with communicative leadership. It is more difficult to convince and direct people due to anxiety and ambiguity seen in society during the pandemic process. To eliminate this anxiety and uncertainty, a persuasive

communication must be applied in it carrying some regulations and collaborations and various rules. This value-based collaboration will make it easier to manage the crisis process. Within the scope of this study, the rhetorical elements that create value-based communication are taken into account. These rhetorical elements are the main and sub-criteria that makeup value-based communication. With this rhetoric, value-based collaboration can be created as a new form of governance. Some procedures, norms and standards are applied to control this collaboration. In this sense, collaboration enables the establishment of communication between people in everyday life practices to create mutual understanding between people. Value-based communication demonstrates personality focus, sustainable communication, trust and clarity. Within the scope of this study, it can be said that messages provided by the Minister of Health via Twitter are in line with the main criteria and sub-criteria of value-based communication and constitutes collaboration.

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No News is Not Good News: The Implications of News Fatigue and News Avoidance in a Pandemic World

Neill Fitzpatrick

In an era dominated by a constant flow of grim news, news fatigue is becoming more recognized as a serious concern, even a health risk. Around-the-clock reports on the pandemic can seem unavoidable, along with ongoing coverage of political upheaval, climate change, and other major global issues. For some, the weight of the world's news becomes too much. A 2019 pre-pandemic survey of 12,000 American adults by the Pew Research Center found 66% admitting they were "worn out" by the sheer amount of news available to them. News fatigue can translate into a desire to consume less news in an effort to preserve and protect one's mental health. A Pew Research Center survey in April 2020 determined 71% of adult Americans say they need to "take breaks from COVID-19 news" while 43% said the news "leaves them feeling worse emotionally". The World Health Organization addressed the concerns about the impact of the news onslaught in the "Mental Health Tips" section of its website. The WHO offers this advice to the public: "Try to reduce how much you watch, read or listen to news that makes you feel anxious or distressed". Growing numbers are heeding this advice and reducing their news consumption. Some are opting for no news whatsoever as a means of coping. In May 2020, the Reuters Institute for the Study of Journalism at Oxford University examined the "infodemically vulnerable" in Britain, those who chose to reduce consumption of COVID-19 related news. More than one-fifth of those surveyed said: "they often or always actively try to avoid the news," with the majority citing the impact on their mood. While mental health concerns appear to be the primary reason behind the increase in avoidance, growing distrust in mainstream media is also cited. While not a new phenomenon, the skepticism surrounding journalism was exacerbated during the pandemic as anti-vaccination advocates and conspiracy theorists questioned the validity and accuracy of the COVID-19 facts shared by news organizations, even governments. In this analysis of research, interviews, news articles, and social media content, I will advance recommendations for journalism researchers seeking to understand these issues. I will also propose strategies for journalists and news organizations seeking to navigate the issues and find solutions to help their embattled profession survive and recover.

Keywords: *journalism, news avoidance, news fatigue, misinformation, trust*

Introduction

For most of 2020 and 2021, the world has been in the grips of the COVID-19 pandemic. The health crisis has generated a barrage of news and information about the virus, its victims, and its overall impact. The Economist called it the most dominant news story since the Second World War (The Economist 2020). It is not difficult to feel overwhelmed by the amount of news related to the pandemic alongside the many other significant global stories, including political upheaval, race-related protests, and climate change. Still, it is the news of the coronavirus

that has dominated news coverage for more than a year. In May 2021, a Google search for the term “COVID-19 news” yielded more than 25.2 billion results. The majority of these stories share common factors such as negative headlines (Aslam 2020) and grim statistics about COVID-19’s death toll, as well as its impact on families, businesses, and health care workers (Sacerdote et al. 2020). For the millions locked down in their homes and working from home offices, the news is the constant connection to the outside world. Whether from social media or more traditional sources, the headlines are all but unavoidable and an incessant reminder of the health crisis. As the coronavirus spread around the world, it was not long before the amount of pandemic information available on various media became staggering and, for some, overwhelming. By April 2020, the World Health Organization was using the term “infodemic” to describe the torrent of COVID-19 news and information emanating from traditional sources, social media, even friends and family members. The WHO also introduced the term “infodemiology”, defining it as “the study of that information and how to manage it” while providing a list of tips to help consumers “identify misinformation or disinformation” (World Health Organization 2020b). It is important to point out that this deluge of news was a growing concern prior to the pandemic. During the presidency of Donald Trump from 2016 to 2020, the daily news cycle – those stories deemed most important and significant by journalists – was described as “insane” and “action-packed” (Kight 2017). The mainstream media’s coverage of President Trump’s announcements and antics, as well as other significant issues, created a seemingly endless news cycle readily available to news consumers anytime on-demand, thanks to 24-hour television news channels and social media platforms. News fatigue seemed an inevitable side effect of this information saturation. In both 2018 and 2019, the Pew Research Center surveyed 12,000 American adults on the topic of news-induced fatigue. Each study found about two-thirds of the respondents admitting they were “worn out” by the sheer amount of news available to them (Gottfried 2020). By April 2020, as the pandemic intensified, so did the fatigue factor. A 2020 Pew Research Center survey of 10,000 American adults found 71% saying they felt the need to “take breaks from COVID-19 news”, while 43% said the news “leaves them feeling worse emotionally” (Mitchell et al., 2020). This research will examine one of the repercussions of news fatigue: news avoidance, when consumers temporarily or completely stop reading, watching, or listening to the news. For some, it may be an exercise in moderation as they limit how much news they consume. For others, it is a conscious decision to shun all forms of news altogether. This trend raises questions about the impact of such shunning on news consumers and on the journalism industry and what, if anything, can be done to slow or reverse it?

Research Problem

This is a descriptive study of the effects of constant news coverage and news consumption of information stemming from significant events or issues over an extended period. Specifically, the constant flow of pandemic-related news is

triggering news fatigue among some consumers and prompting them to limit or avoid news consumption, temporarily or completely.

Research Questions

Through the analysis of existing data and new perspectives gleaned from interviews, I will endeavor to provide answers to the following questions:

What is the impact of news avoidance on consumers and on journalism as an industry?

Is news avoidance a short-term, pandemic-related phenomenon, or is it a trend attributed to issues such as distrust of news media or a decline in the overall quality of journalism?

What can news organizations do to convince the public of the importance of staying informed by professional journalists during a life-threatening global event?

How can journalists and news organizations best demonstrate they are relevant, reliable, and necessary sources of information, thereby regaining the trust of the public?

Methodology

This qualitative research is an analysis of news stories, opinion articles, and social media content primarily between January 2020 and June 2021. The news stories and opinion articles focused on the issues of the increased volume of news in recent years as well as on news consumption and the growing evidence of anxiety, stress, and “fatigue” caused by the constant barrage of news available to consumers. The stories and opinion articles were found on the websites of mainstream media outlets in North America and Europe as well as in studies and surveys conducted by journalism-related organizations. For example, the Pew Research Center, an American organization that studies journalism and other topics, found in an April 2020 survey that “the continuous news churn has had an impact. A majority of Americans say they need to take breaks from it, many say it makes them feel worse emotionally and half say they find it difficult to sift through what is true and what is not” (Mitchell et al. 2020). This material was supplemented with theories and research from academic research papers and journals discussing news consumption and related topics such as human behavior, trust in journalism, and the relevance of inclusion and diversity in the news industry. One example is the study *Sentiments and emotions evoked by news headlines of coronavirus disease (COVID-19) outbreak* which examined more than 141,000 news headlines pertaining to COVID-19 and the pandemic and found “Fear, trust, anticipation, sadness, and anger were the main emotions evoked by the news headlines” (Aslam, 2020). To determine the growing prevalence and increased public awareness of terms such as “news fatigue” and “COVID-19 news”, Google searches with these words were conducted. The research also utilized unobtrusive observation, based on 30 years of experience as a journalist, to

examine the growth of news fatigue and news avoidance before and during the global pandemic. In addition, interviews on these topics were conducted with journalists across Canada chosen for their experience, and for their insight into the news industry and the challenges facing the profession. The questions were as follows:

- How do you respond to someone who says they have no need for news/journalism?
- Some say traditional, professional journalism has become irrelevant. How do you respond to this?
- In your opinion, what can journalists and news organizations do, or change, to restore confidence and trust in journalism and win back news avoiders?

The questions were sent to 31 journalists in January and February 2021. Responses were received from 14 journalists. While some of the interviewees have decades of experience, others are early in their journalism careers and have a different perspective on the challenges and potential solutions. This is relevant because the news industry has changed dramatically in the past two decades, especially, with the advent of the Internet and social media. The responses indicated that the younger journalists, those new to the profession, have different perspectives and opinions on the future of news than their more senior colleagues. As an example, one of the younger journalists responded with apparent frustration when asked what journalists and news organizations can do to restore trust and win back the news avoiders (question 3): “Stop with the bullshit. Stop with the trying to 'keep TV going' -- get in on technology instead of responding to it. Diversify positions of power” (BB, 2021). Given the subject matter and the critical, honest analysis requested, all names have been removed. Table 1 displays the initials used to identify the interviewees.

Table 1. *Initials Used to Identify the Interviewees*

Identifier	Title	Experience	Gender
RA	Web journalist	10 years	Female
GC	Senior editor/news host	25 years	Male
SG	News anchor/producer	35 years	Male
BR	Senior producer/host	25 years	Male
MA	Video journalist	5 years	Female
BJ	Former journalist	30 years	Male
GR	News anchor/producer	20 years	Female
LJ	News manager	20 years	Male
OS	News manager	15 years	Male
MJ	Supervising producer	30 years	Female
ST	Retired news manager	40 years	Male
BB	Journalist	15 years	Female
MR	Journalist	20 years	Female
RG	Chief news anchor	25 years	Male

The grounded theory approach was utilized to analyze the content of the stories, articles, and interviews and to identify recurring themes and categories. Developed by Glaser and Strauss in 1967, the purpose of the grounded theory

qualitative methodology approach is to “construct theory grounded in data” (Corbin and Strauss 2015). However, this study’s qualitative research is descriptive in nature. It is not intended to advance any new theory. Instead, the goal is to provide analysis and fresh insight into the recently intensified challenges of news fatigue and news avoidance as they relate to the present and the future of journalism. According to Corbin and Strauss, there is value to this descriptive approach as the analysis can add to existing knowledge and it “enables persons to take action and alter, contain, and change situations” (Corbin and Strauss 2015). In the case of this research, the goals are to identify potential solutions to increased news fatigue and avoidance, encourage news organizations and journalists to evaluate and contain the current situation, and develop new methods of restoring public trust in journalism by better engaging news consumers with more relevant content.

Significance of the Study

While there has been substantial research into news consumption and its implications, there has been limited study of news avoidance. One reason is that news-induced fatigue and subsequent avoidance have only emerged as significant issues in recent years, from 2016 to 2021. This growth coincided with major, ongoing global stories such as the polarizing Brexit debate in Europe and the tumultuous American presidency of Donald Trump. Trump’s rampant use of Twitter flooded inboxes, newspapers, and television screens due to the mainstream media’s unbridled enthusiasm to report almost everything he said or posted. The president’s highly politicized and often outrageous comments, combined with the non-stop, around-the-clock media coverage, spawned a news cycle that both titillated and alienated news consumers. The headlines and constant news alerts also caused stress for some, with one psychologist describing the condition as “headline stress disorder” and comparing the news onslaught to “missile explosions in a siege without end” (Stosny 2017). While Trump raised eyebrows and Brexit boiled over, the extensive media coverage raised concerns about public trust – in both politicians and the news media (Newman 2018). It was enough for some news consumers to tune out. By 2019, the Reuters Institute for the Study of Journalism’s annual Digital News Report found 32% of those surveyed worldwide said they “actively avoid” the news, with avoidance highest in Croatia (56%), Turkey (55%), and Greece (54%) (Newman 2020). As Trump and Brexit waned, the pandemic infected and monopolized the news cycle. Following a surge of interest in the first few months of 2020, consumers turned away, citing mental health concerns due to the largely negative COVID-19 headlines leaving them “feeling worse emotionally” (Mitchell et al. 2020). As more people choose to avoid the news, occasionally or completely, it is worthwhile to analyze the extent and impact of this avoidance.

Literature Review

Aware or Worn Out?

Humans have a thirst for knowledge. Whether around the corner or around the world, we feel a need to know what's going on and how it may affect our life. Indeed, some believe it is our "duty to keep informed" as responsible citizens (McCombs and Poindexter 1983). This is not a new phenomenon, but what is new is the sheer amount of news available and accessible to people. The abundance of information at our fingertips has increased exponentially in the past 20 years due to advances in technology and the arrival of the internet and social media. It has never been easier for us to access information. As the enormity of the global pandemic became clear in 2020, millions were seeking the latest details from social media and from traditional sources such as radio and television news. In the early weeks of the pandemic, audience ratings, the measure of how many people watch newscasts, soared to unprecedented and unexpected levels for most news organizations (Johnson 2020). As one journalist interviewed for this study stated: "Certainly, raw numbers are lower than they were in 2011/12 but we've seen a stunning revival in ratings over the past year as people clamour for the latest COVID news" (GC 2021). This "clamour" was welcomed by journalists. They had witnessed a slow but steady decline in viewers, listeners, and readers between 2010 and 2020 as growing numbers of consumers, especially the younger demographic, chose to gather news from social media platforms rather than traditional sources (Wakefield 2016). The pandemic, and the desire to stay up to date on the latest developments, changed this. According to another veteran television journalist: "The best news and perhaps the most surprising: our ratings data shows more people are watching our newscasts than ever before" (SG 2021). Again, it's important to emphasize this consumer thirst for details occurred early in the pandemic when the story was changing daily, even by the hour. The 24-hour television news channels also saw audience increases, especially during live broadcasts of announcements by politicians and health officials. "I actually think the pandemic has been the best thing ever for local news and we have seen an unprecedented resurgence of viewers. It has literally put our 24 hours channel on the map" (MJ 2021). However, this audience surge soon became another victim of the pandemic, as consumers turned away, admitting they felt overwhelmed by the constant flow of information. In May 2020, the Reuters Institute for the Study of Journalism at Oxford University examined the "infodemically vulnerable" in Britain, people who chose to lessen the consumption of COVID-19 related news. More than one-fifth of those surveyed said "they often or always actively try to avoid the news" with the majority citing the impact on their moods (Kleis Nielsen et al. 2020). One year later, a similar sentiment was detected in Canada. In May 2021, more than two-thirds (69%) of 1002 Canadians surveyed admitted being "burned out when it comes to consuming news about the pandemic" (Bricker 2021) and more than half (53%) agreed that news organizations should "focus less on COVID-19 and more on other important stories" (Bricker 2021). At the same time, however, the perception of the news media's effectiveness is quite favorable,

with 59% of those surveyed agreeing the coverage helped contain the spread of COVID-19 in Canada. Research has confirmed the mental health impact of news consumption. One study found heightened anxiety, even sadness, in people who watched negative news-related material, such as bulletins, after only minutes (Johnston and Davey 1997). The material shown to the study participants in 2011 was edited to emphasize negative information. A decade later, the real-life negative impact of the pandemic has also been documented. On its website, the Centers for Disease Control (CDC) in the United States highlights the “major effect on our lives” of COVID-19. The CDC’s advice on coping with coronavirus-related stress is to limit news consumption to “just a couple of times a day” and to disconnect “from phone, tv, and computer screens for a while” (CDC 2021). The World Health Organization also addresses the stress factor in the “Mental Health Tips” section of its website, encouraging people to “reduce how much you watch, read or listen to news that makes you feel anxious or distressed.” (World Health Organization 2020a).

Aversion and Avoidance

In discussing news fatigue and avoidance, it is worthwhile to include another term: aversion.

The word’s origin is the Latin *avertere*, which means to ‘turn away from’. Indeed, one definition of aversion is: “a feeling of repugnance toward something with a desire to avoid or turn from it” (Merriam-Webster 2021). One could argue that, for some, news avoidance begins with an aversion to the news. This “feeling of repugnance” may stem from the fatigue generated by the massive amounts of news available to us. The repugnance may also begin with a growing distrust of news organizations and journalists or, perhaps, a lack of confidence in the accuracy of the news stories (Kalogeropoulos 2017). In all cases, the result can be a conscious decision to “turn away” from the news, partially or completely. Partial news avoidance may be fatigue-oriented, with the avoider displaying an aversion only to certain topics or triggers, such as COVID-19, climate change, or Donald Trump’s latest announcements. An active, consistent news avoider “will not accept being confronted with any news” (Weitz 2021). One implication of aversion and avoidance can be a less-informed populace, with citizens who are “are not sufficiently equipped to take decisions in elections or referendums” (Kalogeropoulos 2017). During a global pandemic, the question could be: are news avoiders sufficiently equipped to make informed decisions about their health? Some believe they are or, at least, they believe they are no less informed than their news-consuming counterparts. In the avoider’s view, mainstream, traditional news coverage is largely superficial, providing only a “...distant, water-cooler-level awareness of thousands of stories, at least for the few weeks each is popular” (Cain 2017). Some avoiders proudly proclaim their disdain for modern journalism, stating, (Dobelli 2019) and declaring it “a ridiculous system” (Dobelli 2019). These vocal avoiders also encourage others to adopt their perspectives of recognizing that news is “toxic” and to take part in “a news diet” (Dobelli 2019) as a way of relieving the stress and anxiety caused by media coverage. This speaks to

another issue and another reason some cite for avoidance: the overall quality of mainstream journalism and its ability to properly and effectively inform.

Quantity and Quality

It is difficult to argue that consumers are not informed by news organizations and journalists. Every hour of every day, we can access information from newspaper websites, television and radio stations, and social media platforms. Still, what is the overall relevance of this information for news consumers? How much of it do they actually take the time to read, watch, or listen to because they feel it affects them? As one veteran journalist, now a political communications expert, explained: “Most people who tell me they “don’t read the news anymore” are folks who no longer feel the stories presented are relevant to their lives” (BJ 2021). The issue of relevance, when it comes to news stories, has been the subject of research. One study in 2019 asked consumers to rank a variety of news stories based on what they would read or engage in versus what they would avoid. It found the most relevant stories are those that: “affect their personal lives, as they impinge on members of their family, the place where they work, their leisure activities, and their local community” (Schroder 2019). To put it simply: “People care most about things that affect them” (Dean 2014). At times, this relevance can be based on location. A news consumer tends to be “more interested in his local weather forecast than the national outlook. He is more interested in knowing why a police officer is taking a report on his block than somewhere else in the city” (Dean 2014). However, Dean points out the relevance, the connection, can also be linked to a consumer’s emotions or specific interests. “The reader may identify with a range of life experiences, from the emotional shock of losing a job or worrying about a sick child” (Dean 2014). With this relevance defined, a primary, important question for news organizations and journalists is: how can they ensure relevance? A journalist interviewed for this study believes the answer is audience research: “Quite simply the media/journalists need to take some time to understand audience/reader behavior” (ST 2021). The next step is to act on that research and become more relevant. One American news organization took the time and spent the money to learn what consumers want. The E.W. Scripps company owns 60 television stations across the United States. It sent representatives into 100 homes in various cities to ask about news preferences and relevance. The consumers told them their news needs were not being met and that the non-stop, breakneck speed of the news cycle left them looking for other options: “People craved a deeper look, one that captured their community in full, not just in shards. They wanted longer stories with more context” (Ripley 2021). Scripps analyzed the research and produced a new television newscast format in some test markets with longer, more in-depth stories “that were seven or eight minutes long—an eternity in the business—audiences watched them to the end, as long as they were well told” (Ripley 2021). The positive reaction to the deeper storytelling format is mirrored for news organizations that are placing a greater emphasis on an approach called “solutions journalism”. The Solutions Journalism Network was founded in 2013 to “change the culture of news” and to foster “rigorous reporting on responses to

social problems” (Solutions Journalism Network 2013). It does this by training journalists to think differently about the stories they cover: “We help reporters, producers, and editors bring the same attention and rigor to stories about responses to problems as they do to the problems themselves” (Solutions Journalism Network 2013). The goal of the training is to help win back the trust of news consumers who feel disconnected from journalism due to perceived shallow, negative news coverage by providing “a more accurate account of the state of play than does a dystopian ticker tape of corruption and failure” (Solutions Journalism Network 2013). One study conducted for the organization gave participants different versions of news articles. Some articles focused on a problem, while others focused on the problem and potential solutions. The researchers found that “solutions-based journalism holds promise in at least three areas: heightening audiences’ perceived knowledge and sense of efficacy, strengthening the connection between audiences and news organizations, and catalyzing potential engagement on an issue” (Curry and Hammonds 2014). Of the three areas, strengthening the connection between audiences and news organizations may be the most critical to the future of journalism. In the words of OS, a senior journalist interviewed for this study, the strategy will require a new approach by news organizations and the willingness to change: “to build trust and confidence with news avoiders, we must constantly be challenging how we do things. Current attitudes towards the media don’t have to mean the end of journalism – it is merely an opportunity to fast-track essential modernization within the industry to truly re-engage with the public we serve” (OS 2021).

Restoring Trust

All journalists interviewed for this research are aware of the avoidance trend and the growing numbers of so-called “never-newsers”. Some, more than others, realize they and their news organizations must do more to regain or keep the public’s trust. Greater transparency is a vital component of this. Educating news consumers on how journalists perform their roles and why certain stories and issues are covered over others may be more important than ever before.

“I do think we need to do a better job of educating the public about how we operate, being transparent about the standards and practices and not just the broad strokes but by openly explaining in our journalism why we made specific decisions” (BR 2021). Recent research conducted on the subject of “trust in news” indicates the public’s lack of understanding of journalism is a significant factor: “It suggests that news organisations would benefit from providing clearer cues and signals about who they are, their histories, what they stand for, and how they do their work” (Toff et al. 2021). This theme of transparency and education is shared by another journalist, who believes quality content and coverage will attract and retain consumers: “Be transparent about story selection and process. Let the public know why you’re covering a story a certain way. If your content resonates, the audience will show up” (BB 2021). For some, trust through transparency means less “telling” by journalists and more “showing” by providing the reader with not only the story and the interviews but with the information and facts that have been

uncovered by the reporter, such as charts and data. This open sharing of information “respects the reader’s intellect” (Stead 2021) and empowers consumers to “reach their own conclusions” (Stead 2021) about the story or issue.

Inclusion and Accuracy

Journalist MA is a recent university graduate. With less than five years of experience, she is relatively new to the profession. Still, she believes she understands why many news consumers have lost trust in journalism in recent years. MA sees it as a reflection of how the industry has evolved into a non-stop, 24/7 entity that endeavors to mirror and compete with the omnipresent social media platforms as news sources. “Fast food journalism, while often well-meaning, has harmed many marginalized communities because it often lacks compassion and sensitivity” (MA 2021). Understanding the “marginalized communities” is now seen as a priority for growing numbers of news organizations hoping to remain relevant and rebuild sagging audience numbers. In many countries, mainstream news outlets are under increasing pressure to operate with more employees that accurately reflect the diversity of the community, including people in senior and management positions. A 2019 survey of more than 1800 newspapers in the United States found “people of color comprised 21.9 percent of salaried employees,” up slightly from 21.8 percent in 2018 (Clark 2019). The survey also found people of color made up only 18.8 percent of newsroom managers. In the United Kingdom, a 2021 survey indicates a lopsided lack of diversity in newsrooms, with BAME (Black, Asian, and minority ethnic) journalists comprising just 8 percent overall (Spilsbury 2021). In addition to staffing, newsrooms are also being encouraged, even ordered, to seek out and produce more stories that are relevant to diverse audiences. Younger journalists, especially, see this as a priority: “We need more BIPOC (Black, Indigenous, People of Color) journalists in positions of power and covering stories that mean something to people and communities that have been underreported” (RA 2021). The younger generation of journalists, both white and ethnic, are, at times, frustrated with the slow pace of change to the structure and philosophies of traditional newsrooms: “The institutions that we all trusted for so long have been revealed to not be as objective as they once claimed. In fact, at least in North America, it has been shown time and time again, the objectivity is through a white-centric lens” (BB 2021). They are adamant a more inclusive, diverse journalism industry can both retain consumers and win back avoiders: “Rethinking our ethics and understandings of bias and objectivity play a big part in building trust” (MA 2021). Some organizations are taking action. The BBC (British Broadcasting Corporation) first created an internal Diversity and Inclusion Advisory Group in 2014. In 2019, a “refresh” of the group was announced with the chair stating: “I want to support the BBC’s ambition to be the most creative broadcaster in the world. To do this, it needs to truly reflect the diversity of all its audiences, both on screen and behind the camera” (Ilube 2019). The announcement of the “refresh” also revealed that BAME staff in leadership roles at the BBC was at 11.4 percent in 2019, up slightly from 10.4 percent the previous year. In September 2020, the broadcaster unveiled an updated diversity

and inclusion plan that calls for new “50:20:12 workforce targets”. Specifically, the goals are “50 percent women; at least 20 percent black; Asian or minority ethnic; and at least 12 percent disabled employees” by 2025 (BBC 2021). In the Canadian province of Manitoba, the CBC (Canadian Broadcasting Corporation) is taking a different approach to inclusion and connecting with its audience. CBC Manitoba launched its first community advisory board in May 2021, advertising for members of the public who meet specific criteria: “The board will be chosen to reflect the ethnocultural, socio-economic, geographic and political diversity of the province”. Once selected, the 15 board members will “help add context and perspective” to the newsroom’s coverage and provide “advice about specific reporting projects”. However, the community members “will not oversee editorial decisions” (MacKenzie 2021). Conversely, the British online news company Tortoise, founded in 2019, invites people to become members of the newsroom and makes some radical commitments on its website: “We’ll show you our inner workings. We’ll let you know when we’ve fallen short” (tortoisemedia.com 2021). One of its founders, James Harding, is a former head of news at the BBC. In his “What we are for” essay on the Tortoise website, he outlines how the company is different: “We want ours to be a newsroom that gives everyone a seat at the table; one that has the potential to be smarter than any other newsroom, because it harnesses the vast intelligence network that sits outside it” (Harding 2019). If memberships are an indication, Tortoise’s unique approach is effective. Since its launch in 2019, the company claims 100,000 people have joined, paying up to 100 British pounds a year for a seat at the Tortoise table (Tortoise 2020).

Conclusion

The COVID-19 pandemic is unquestionably a global crisis, but it has also provided an opportunity for news organizations and journalists to illustrate their relevance and regain a level of trust with news consumers. In the first months of the pandemic, news audience levels increased significantly as an anxious public sought any and all details of the pandemic, the lockdowns, the death toll, and the safety campaigns. However, as the pandemic continued, audience levels began to dip as consumers found themselves overwhelmed and confused by the amount and variety of COVID-19 information coming from many sources. Of the many questions surrounding news avoidance, one of the most concerning is the effect of fewer people consuming news, at least in traditional formats such as newspapers, television, and radio. The reduction of news audiences is unquestionably a financial concern for news organizations that rely on revenue from advertising to continue operating. Less revenue generally means cuts to resources, as in fewer journalists seeking the facts and telling stories. There is a greater impact: fewer people staying connected and informed of issues and events within their communities and around the world. Journalists interviewed for this study share this avoidance concern. Indeed, GR calls the pandemic “a perfect example” of why professional journalists are needed:

“This was the time for news organizations to present the issues/concerns and to ask questions of medical professionals and government officials on how the virus works, the impact on the healthcare system and the economy, and what plans should have been in place for this public health emergency” (GR 2021).

Still, there is a very real possibility that news fatigue and avoidance are more than short-term, pandemic-related issues and that growing numbers of consumers are disappointed and disillusioned with news organizations and their products. RG believes this is a crucial time for journalists to illustrate their skills and prove their worth to information-hungry consumers.

“We are swimming in junk. Irrelevant, funny, alarming, distracting, compelling, false junk. Who is going to sift through it? If there’s no need for traditional journalism, we would leave this critical path out of the pandemic to individual storytellers and partisans. It would confuse, distort and misinform millions of people” (RG 2021).

Journalists have long defended themselves and their profession, and, clearly, they continue to do so. However, they must spend less time defending and do more to educate news consumers about the profession and its processes. The lack of knowledge about why reporters and news agencies do what they do invariably leads to misconceptions, stereotypes, and a lack of trust. In its annual Trust Barometer, which measures trust in institutions around the world, the Edelman communications firm found trust in media, both traditional and social, at all-time lows in 2021. A factor in the plummeting trust level appears to be a strong perception of bias among journalists. Of the 33,000 people surveyed by Edelman, 59% agreed with this statement: “Journalists and reporters are purposely trying to mislead people by saying things they know are false or gross exaggerations” (Edelman Communications 2021). Nearly two-thirds, 61%, agreed with the statement, “The media is not doing well at being objective and non-partisan” (Edelman 2021). An essential first step in restoring trust and confidence involves listening more to the concerns of news consumers, in general, and news avoiders, specifically, and acting on those concerns.

“We need to be extra sensitive to the climate. People are very suspicious right now. We have to be better than we have ever been before. That includes making sure we are fair, accurate and we must guard against personal bias creeping into our journalism” (LJ 2021).

Based on my experience as a journalist, I believe that many news organizations have fallen short in investing the time and money to design and conduct relevant audience research to confirm what consumers want in news coverage, as opposed to assuming to know what they want based solely on experience and what has worked in the past.

“Often it’s quite obvious what the audience is really interested in, but some journalists think they know better” (ST 2021).

Along with research, more transparency in news coverage is an essential element in rebuilding trust and winning back avoiders. Increased levels of transparency can be attained by providing detailed explanations and background on how story elements are gathered, from the interviews to the data and documents cited in the story. For example, publishing or posting entire interviews or transcripts would enable consumers to determine if the interviewee's quotes were taken out of context or influenced by editing. Such transparency would help consumers better appreciate the role of the journalist by helping them understand the news process and the work involved in finding and telling stories, from the initial concept to the final published version.

“We also need to “pull back the curtain” more often. Show people where a story came from, why and how we covered it” (MR 2021).

This transparent approach would serve to clarify and alleviate long-standing public misconceptions of bias among reporters and news organizations. It would also help engage disenchanted news consumers and entice them to watch, read, and listen once again.

“Consumers are on high alert for balance and objectivity. If they see you are making a consistent effort to be fair, they will consume your product” (LJ 2021).

Greater transparency and improved understanding could also help attract a new and younger audience, something sorely needed for traditional media organizations, especially, as their existing audiences age and die off. In 2017, a survey of American adults found the median age of cable news consumers was 60 for CNN and 65 for FOX News (Katz 2018). A 2020 survey by Statista indicated that only 15 percent of American adults aged 18-29 watch cable news daily or regularly. Perhaps not surprisingly, 42 percent of the 18-29 demographic admitted they never watch cable news (Statista 2020). The public's overall interest in news has declined in many countries, according to research conducted by the Reuters Institute for the Study of Journalism. Its 2021 Report on News shows the number of people who say they are “very or extremely interested” in the news has dropped by an average of five percentage points since 2016. While there has been little or no change in some countries (Germany, Netherlands), the drop is dramatic in others, including a “17 percentage point drop in Spain and the UK, 12 points in Italy and Australia, and eight in France, and Japan.” (Newman 2021). Journalists and news leaders must ensure the coverage and story selection are relevant and reflective of today's society and issues. Improved trust and increased relevance can also be attained when news organizations address the lack of diversity and alternative perspectives in newsrooms and strive for improved understanding of ethnic and marginalized communities. The world has changed dramatically in the past 20 years but, apart from technology, little has changed in how newsrooms and journalists inform the public. New perspectives are required from a new generation of informed, diverse journalists who are willing to listen to and learn from news consumers and news avoiders. It seems clear the “old ways” are simply no longer viable and, frankly, no longer accepted by a more discerning, demanding public.

“We need to challenge our own unconscious bias and that of our colleagues to ensure journalism truly reflects the priorities of our *entire* audience” (OS 2021).

Still, just as there are news avoiders among consumers, there are those within journalism who refuse to alter their traditional, tested methods of storytelling. This reluctance, or resistance, is at their peril. Without a revised focus and attitude, journalism will continue to falter, and, in many cases, news organizations will continue to fail in the eyes of consumers, and in the eyes of some journalists. MA is the youngest journalist interviewed for this research. She only recently graduated from journalism school and has the least practical experience by far. Still, she is the future of a struggling, embattled profession and understands it must adapt to the changing perspectives and demands of society.

“Resisting change and failing to innovate only results in layoffs. If submitting to an ever-changing media landscape keeps journalism afloat but makes “traditional” reporting irrelevant, so be it” (MA 2021).

It is clear both the consumers of news and those who produce it are frustrated with the current environment, but it is the journalists and news organizations that have the most to lose if nothing changes. The pandemic is an opportunity for journalists to display their relevance. The question is: can they regain the trust of the public and win back the news avoiders?

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“This Virus is a Common Threat to All Humans”: Discourse Representation of COVID-19 in Selected Newspaper Editorials

Ayo Osisanwo

Existing studies on viruses with bias for COVID-19 have mainly been carried out from non-linguistic fields. Linguistics-related studies have not examined the media representation of COVID-19 since it is a recent development. This study, therefore, identifies the representational strategies, discourse structures and discourse strategies deployed by selected newspapers in representing COVID-19 and associated participants. Data were retrieved from selected COVID-19-related editorials from four purposively selected countries and continents across the world: New York Times (USA, North America), The Guardian (UK, Europe), China Daily (China, Asia) and The Punch (Nigeria, Africa), published in the early periods of the pandemic, and precisely from January 1 – March 31, 2020. Guided by aspects of van Dijk’s socio-cognitive model of critical discourse analysis on ideological discourse structures, data were quantitatively and qualitatively analysed. The newspaper editorials unusually converged to negatively represent an issue – COVID-19 – because it is largely negatively viewed by all. Ten representational strategies (like economic cankerworm, threat to humans, common enemy), six discourse strategies (like demonising, criminalising, condemnation) and twelve ideological discourse structures (like Actor Description, Authority, Burden) and different participant representations and roles (like solver, potential super spreader) were identified in the study. The newspapers largely set the agenda on the negative representation of the virus and its potential havoc on all facets of human endeavours, thereby giving emotional and informational appeal to all to join hands in earnestly silencing the epidemic.

Keywords: *COVID-19, media representation, newspaper editorials, discourse strategies, discourse structures*

Introduction

The novel coronavirus (otherwise known as COVID-19), which is an acute respiratory disease, allegedly evolved in Wuhan China in December 2019. The first official report of the virus was made on December 8, 2019. The virus has rapidly spread from a single city of Wuhan to other parts of China within a short time and has since become a global pandemic. This has not only attracted attention all over the world, but has equally hampered a lot of activities all over the world. In fact, the World Health Organization (WHO), on 30 January 2020, officially declared the COVID-19 epidemic as a public health emergency of international concern. As at 12noon on April 19, 2020 the number of recorded cases of COVID-19 had risen to 2,347,777; the number of deaths was put at 161,126; the number of recovered and discharged cases was 605,661; while 1,580,990 were the

outstanding active cases (worldometers.info/coronavirus). The WHO (2020) has described coronavirus (COVID-19) as an infectious disease caused by a newly discovered novel coronavirus, and most people infected with the COVID-19 virus often experience mild to moderate respiratory illness and recover without requiring special treatment. Meanwhile, older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. The WHO warned that the best way to prevent and slow down its transmission is for all to be well-informed about the COVID-19 virus, the disease it causes and how it spreads¹. The WHO has further confirmed that the COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes; and further advised that since there is no known vaccines or treatments for COVID-19 yet, human beings across the world must practise respiratory etiquette (for example, by coughing into a flexed elbow or tissue).

Compared with other illnesses such as influenza, SARS, Ebola and so forth, COVID-19 has been presumed as (one of) the major killer-diseases across the world in 2020. COVID-19 is a major, if not the most, cause of human mortality in 2020. Arguably, it has had the highest fatality rate among known viruses in 2020. Different ailing conditions have had encounters with the human race at different times. A hundred and two years ago, that is, in the year 1918, there was the influenza pandemic that ravaged the globe. Potter (2001) reports that 50 percent of the world's population was infected during the 1918 pandemic, while the total mortality was between 40 and 50 million out of a world population of 1.8 billion then (Barry, 2005). Hence, the fatality rate was 5.6 percent. Similarly, seventeen years ago, that is, in the year 2003, there was the outbreak of severe acute respiratory syndrome (SARS). According to the WHO, 8098 people worldwide contracted SARS during the 2003 outbreak, out of which 774 died, making the SARS fatality rate 9.6 percent. Comparing the two, the WHO remarked that the death toll percentage of 9.6 percent from SARS was far higher than that of the 5.6 percent of the 1918 influenza pandemic. With the data supplied earlier, the fatality rate of the current COVID-19 has reached almost seven percent.

The Economist on April 7 confirmed the deadly nature of the coronavirus thus: "The novel coronavirus has killed tens of thousands of people around the world since it first emerged in China last December.... It is a choice between life, death and economy!"² No doubt, the level of fear in the world has been documented by the *London Economist*, as there is palpitation in the world with the current COVID-19 outbreak. Already, it is the first severe infectious disease that emerged and attracted so many victims within a very short time in the 21st Century.

COVID-19 is a very sensitive matter; its sensitivity and outbreak has made it a foremost matter and most reported issue in all tabloids across the world in 2020. The attention given to COVID-19 has suppressed some other events happening concurrently more so that the world seems to have been in a standstill combatting the coronavirus. Media constitute one of the main means through which text consumers get to know more about coronavirus and its escapades. Hence, news

¹https://www.who.int/health-topics/coronavirus#tab=tab_1.

²<https://www.economist.com/topics/london-1>.

producers sit at a vantage position of orienting the readers. No doubt, media outlets have equally risen up to the occasion to give the virus a wide publicity and reportage across the world. Hence, COVID-19 has been the subject of continuous widespread media coverage, especially since the beginning of 2020.

Existing works on media discourse have focused on how selected persons, groups or issues are represented based on their religious, social or political inclinations, while others have been based on their tribal proclivity or ideological stance (Majid 2008, Mahdi 2009, Talaat 2011, Osisanwo 2011, 2016a, 2016b, 2017a, 2017b, 2019, Oyeleye and Osisanwo 2013a, 2013b, Chiluwa and Odeunmi 2016, Osisanwo and Oluwayemi 2018). Such studies have examined how the media have represented actors and their actions in these events. However, the newness of coronavirus which generated an uproar and alarm across the globe has denied it consideration in the academia. Some of the existing works on COVID-19 are works from the sciences. The science-related studies have explored the epidemiology, causes, clinical manifestation, diagnosis, prevention and control of the novel coronavirus. However, studies exploring the linguistic intervention have not emerged. Studies in this domain, like the current one, are urgently needed to contribute their linguistic and discourse interventions to combatting the outbreak of COVID-19. Linguists have not examined COVID-19 in relation to rhetoric, media representation and so forth. Meanwhile, existing linguistic studies (e.g., Eagleton 2004, Washer 2004, Chen 2005, Larson et al. 2005, Wallis and Neriich 2005, Baehr 2006, Chiang and Duann 2007, Trčková 2015) or virus-related studies have only considered the representation of related ailments like Influenza, SARS, Ebola. This paper therefore focuses on the discourse representation of coronavirus in the contents of the editorials of major newspapers selected across four countries from four continents across the world. What sort of representations have the newspapers used to form the readers’ opinions on coronavirus?

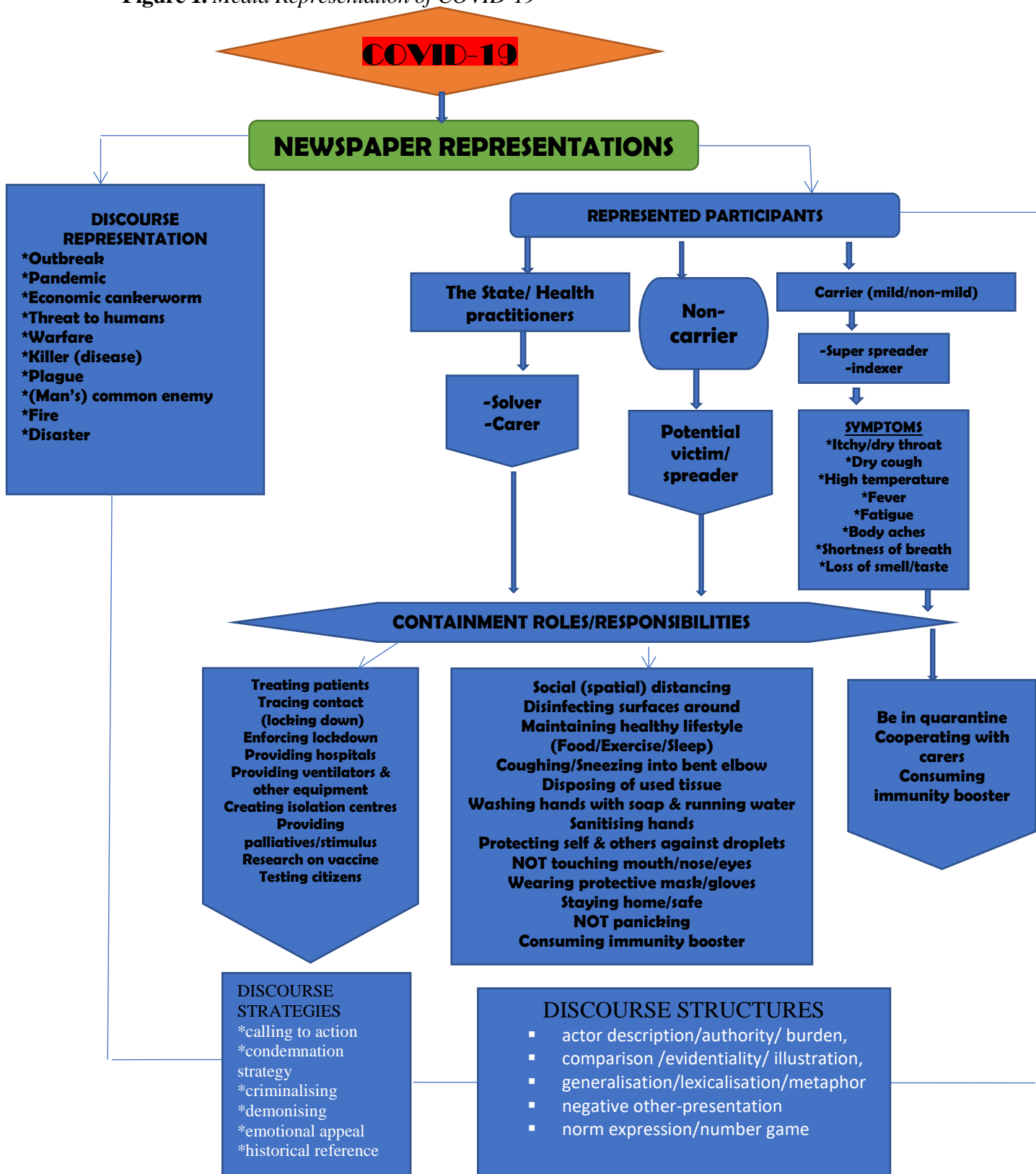
Theoretic Orientation

Critical Discourse Analysis (CDA) is the study of opaque relationships of causality and determination between discursive practices, events and texts, and wider social and cultural structures, relations and processes (Fairclough 1995, Wodak 2002). CDA is a special form of social cognition shared by social groups which forms the basis of their social representations and practices including their discourse (van Dijk 2001a). The socio-cognitive approach to CDA links language practice to social cognition. This approach focuses on the fundamental importance of intuition and society in critical analysis of discourse. The socio-cognitive approach of van Dijk incorporates what van Dijk calls mental models. A mental model is a subjective representation of specific events covered in discourse and it represents the personal Episodic Memory of individuals because it can be identified with people’s experience (van Dijk 2001a, 2006a). Though mental models are personal, they also “involve the instantiation of general, socially shared knowledge or beliefs” (van Dijk 2006b, p. 367), and signify the necessary interface between the personal and the social, between discourse and society. The mental models describe and explain “how social structures influence and are affected by discourse

structures” (van Dijk 2001b, p. 112). Discourse and social structure are mediated by social cognition. In essence, the human mind is a very significant dimension in the socio-cognitive approach. The capability of the socio-cognitive model of CDA to account for the diverse nature of the language use in media representations favours it for this study. To understand media discourse, there is need to examine the underlying media cognition of the represented participants in news reports and editorials. Such discourse is not only social in orientation but also embodies individual and non-individual characters who are assigned different roles in the representations.

Out of the hundreds of possible categories, van Dijk (2006c, pp. 735–739) introduces 27 categories of ideological discourse structures which include actor description, authority, burden (Topos), categorisation, comparison, consensus, counterfactuals, disclaimer, euphemism, evidentiality, example/illustration, generalisation, hyperbole, implication, irony, lexicalisation, metaphor, self-glorification, norm expression, number game, polarisation, Us-Them, populism, presupposition, vagueness, victimisation, dramatisation and polarisation. According to van Dijk the ideological discourse often features the following overall strategies of what might be called the ideological square: emphasise our good things, emphasise their bad things, de-emphasise our bad things, de-emphasise their good things. However, the manners in which such ideologies are “expressed and especially persuasively conveyed may of course also involve many formal aspects of grammar, discourse and conversation”. Meanwhile, we have found twelve of the twenty-seven useful for the purpose of this paper. They include *Actor description*, which has to do with the way in which actors or members of a particular society are described either in a negative or positive way; *Authority*, which has to do with mentioning authorities to support one’s case; *Burden*, which has to do with the use of standard argument as sufficient reasons to accept the conclusion; *comparison*, which has to do with comparing ingroups and outgroups; *evidentiality*, which involves the use of some evidence or proof to support one’s knowledge or opinion; *Example/Illustration*, which involves using concrete examples in form of short stories to illustrate or make a general point more credible; *generalisation*, which has to do with using generalisations instead of giving concrete stories; *lexicalisation*, which involves using specific lexical items to express underlying concepts and beliefs; *metaphor*, which is the use of imaginative and powerful words and expressions to describe; *negative other-presentation*, which involves classifying outgroups as bad; *norm expression*, which involves giving norm statement about what “we” should and should not do; *Number game*, which has to do with the use of numbers and statistics to appear credible. Therefore, the identified twelve ideological discourse structures of the socio-cognitive approach will be applied to this study because they are capable of accounting for implicit information that forms writers’ mental models. The related aspects of this socio-cognitive model are represented on Figure 1.

Figure 1. Media Representation of COVID-19



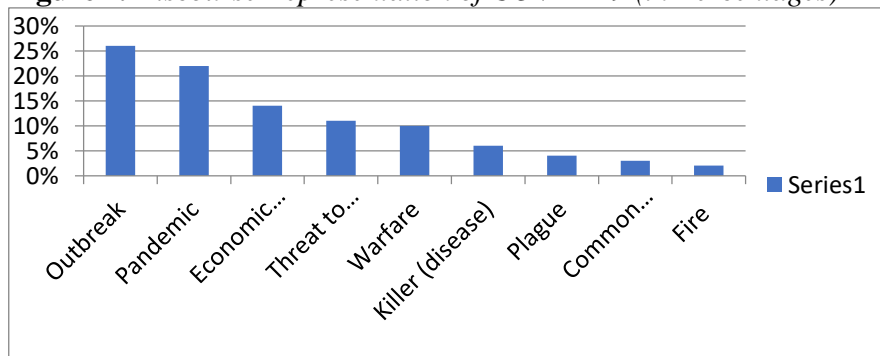
Methods

For data, editorials on coronavirus from four purposively selected newspapers from four countries and four continents across the world were purposively selected. The selected newspapers are papers rated within the top 200 newspapers in the world (4imn.com Newspaper Web Ranking). They include *New York Times* (USA, North America), *The Guardian* (UK, Europe), *China Daily* (China, Asia) and *The Punch* (Nigeria, Africa). The selected editorials on coronavirus-related issues are those published in the early periods of the pandemic, and precisely from January 1 – March 31, 2020. The online versions of the papers were assessed. From the 364 newspapers published during the selected period, that is 91 publications per newspaper, the editorials that were strictly written on coronavirus were retrieved thus: *New York Times* (12 editions), *The Guardian* (18 editions), *China Daily* (12 editions) and *The Punch* (5 editions). The articles were critically read and the aspects that relate to discourse representations of coronavirus were culled out for quantitative and qualitative analyses - with more emphasis on content-and-discourse.

Analysis and Findings

As presented on Figure 1, which is the summary of the findings on media representation of COVID-19, ten representations are identified in the sampled newspaper editorials. The representations are COVID-19 as outbreak, pandemic, economic cankerworm, threat to humans, war, killer (disease), plague, common enemy, fire and disaster. In addition, six discourse strategies: demonising the disease, criminalising the disease, calling the state to action, emotional and informational appeal to the masses, condemnation of the state, and historical reference; twelve ideological discourse structures: actor description, authority, burden, comparison, evidentiality, illustration, generalisation, lexicalisation, metaphor, negative other-presentation, norm expression, and number game; and different participant representations and roles: solver, (potential super) spreader, and so forth, were identified in the study. Figure 2 presents the percentage of dominance of the representations. I now discuss the discourse representations and other parts of the analysis.

Figure 2. Discourse Representation of COVID-19 (in Percentages)



Representations

The newspaper editorials unite to index COVID-19 as a negative phenomenon. Hence, a major representation generated to cut across all representations is the negative portrayal of COVID-19. All the identified ten representations are subsumed under the negative representation of the virus.

Outbreak

Representation of COVID-19 as outbreak is the most dominant (26%) representation in our data corpus. The newspaper editorials converge to represent COVID-19 as outbreak – a sudden rise in the incidence of a disease. The reason for the convergent representation is not far-fetched since COVID-19 or coronavirus has been largely described as a condition that has brought about a sudden increase in the number of carriers across the world. Texts 1 to 3 exemplify the deployment.

- (1) Lombardy, a sophisticated region in the north with a good health care system, was quickly overwhelmed by its coronavirus outbreak (*NYT*, March 12, 2020).
- (2) Data shows that the UK’s coronavirus outbreak is following a similar trajectory to Italy’s, with around a two-week delay (*The Guardian*, March 22, 2020).
- (3) In the wake of the outbreak of the virus in China, the country received heart-warming support of various kinds from many countries and a number of international and regional organizations, which consolidated the Chinese people’s confidence that they would be able to overcome the virus (*China Daily*, March 30, 2020).

In texts 1–3, the editorials of the sampled papers deploy such discourse structures as lexicalisation, burden, illustration, evidentiality to support the representation of COVID-19 as an outbreak. The lexicalisation of this representation implicates the virus as an epidemic eruption that necessitates exigent attention. In addition, the premodification of the word “outbreak” in the expression “coronavirus outbreak” underscores possession, and implicates COVID-19 as the agent behind the outbreak. The expression, “outbreak of the virus in China” equally nominalises the outbreak in point as the COVID-19 virus, and further implicates China as the source of the virus. The rendition of the editorial in text 1 deploys Burden to incriminate COVID-19 as a dastardly outbreak which was able to render helpless a region that had sophisticated health care system, that is, Lombardy, Italy. This argument, adduces the Lombardy experience as the need to accept the conclusion that COVID-19 is an epidemic or outbreak, and sufficiently underscores the need for the state in conjunction with the health-workers to immediately collaborate to picket the outbreak before it goes out of control.

Pandemic

The newspaper editorials represent COVID-19 as a pandemic – a disease that spreads over a whole country or the whole world. This representation, accounting for 22% of the total representations is exemplified in texts 4–6.

- (4) Scientists from the Johns Hopkins Center for Health Security estimate that the coronavirus pandemic could necessitate anywhere from 200,000 to 2.9 million I.C.U. visits, and ultimately require some 67,000 I.C.U. beds (*NYT*, March 12, 2020).
- (5) It now appears almost inevitable that the new coronavirus outbreak will soon be identified as a global pandemic (*The Guardian*, March 18, 2020).
- (6) FOR Nigeria, which has just recorded its first novel coronavirus death, the tragic footprints of the global pandemic have become inescapable (*The Punch*, March 24, 2020).

The preponderant use of “pandemic” to describe COVID-19 in the editorials is motivated by the subsisting experience from the disease. The newspapers converge to implicate that the virus is a pandemic, post-modifying the virus in “coronavirus pandemic” (text 4), and nominalising the virus in “a global pandemic” (text 5) and “the global pandemic” (text 6). In text 4, the editor deploys the use of Authority (Argumentation) and Evidentiality, citing Scientists from the Johns Hopkins Center for Health Security and the estimated figures to support his case and authenticate the evil effect of COVID-19 as a pandemic that requires all attention to mitigate the projected negative impact. Both texts 5 and 6 deploy the use of Actor Description to designate coronavirus. The word “pandemic” has to do with a disease that spreads over a whole country, in the first instance, and if not properly managed, could spread globally. The point in *The Guardian’s* editorial in text 5 “the new coronavirus outbreak will soon be identified as a global pandemic” accentuates the growth in the spread of the virus. The representation incriminates the states and world leaders as not doing enough to combat the virus. COVID-19 is further given a negative representation in text 6 “the tragic footprints of the global pandemic have become inescapable”. The information of the arrival of the virus in Nigeria and the construction of the inescapability of the footprints of the virus in Nigeria call on the leaders, health-workers and individuals to activate their roles in the different containment measures.

Economic Cankerworm

A canker(worm), viewed in the strict sense as a disease that destroys the woods of plants and trees, is also generally seen as an evil or dangerous influence that spreads and affects people’s behaviour. The newspaper editorials converge to imply that COVID-19 is an economy canker that, if not immediately tackled, will throw the whole world beyond economic recession. The preponderant representation of COVID-19 as an economic canker takes 14% of the total representations. Texts 7–10 exemplify this representation.

- (7) Mr. Trump already has signed an \$8.3 billion spending bill focused on public health measures, but more is needed (*NYT*, March 12, 2020).
- (8) “Using the word pandemic now does not fit the facts, but it may certainly cause fear”, the WHO director general, Dr Tedros Adhanom Ghebreyesus, warned on Monday. As concern spreads, economic effects are growing alongside the human toll. Stock markets have taken a hammering. Airlines are suffering, major international events are being cancelled, and companies dependent on Chinese-made components have halted production (*The Guardian*, February 25, 2020).
- (9) Since almost all major economies, ranging from the European Union to East Asia, and the United States, are battling the virus, and the infection rate is in an explosive growth stage in many of the countries, a global recession is becoming ever more likely as the virus spreads worldwide (*China Daily*, March 11, 2020).
- (10) AS the country braces for the inevitable adverse economic impact of the raging coronavirus pandemic, the federal and monetary authorities, the legislature and the private sector have separately been rolling out a raft of measures to stave off catastrophe.Italy’s €3.5 billion stimulus, France’s €45 billion, Australia’s A\$17.6 billion, South Korea’s US\$9.8 billion and China’s \$270 billion loan relief programmes are designed to provide immediate succour to the sick, maintain infrastructure, keep companies and wages afloat and support consumer spending. Efforts by Nigeria should aggregate these objectives (*The Punch*, March 31, 2020).

The editorials demonise COVID-19 by portraying the virus as an evil that is capable of throwing the world economy into mayhem. Since the state needs to fund the health facilities with huge sum while a running economy that could have kept running to cushion the depleting effect of the funding is at a standstill, this portends a grave danger to the world. Text 7 deploys Illustration discourse strategy to exemplify the huge amount “\$8.3 billion spending bill” that the US President has already released to fight the virus. The expression that suggests the insufficiency of the fund “but more is needed” implicates the virus as a canker (worm) that is eating into the fabrics of the world economy. The editor in text 8 also deploys example/illustration discourse strategy, lexicalisation and Negative other-presentation to implicate the virus as economic cankerworm. The use of expressions such as “Stock markets have taken a hammering”, “Airlines are suffering”, “major international events are being cancelled”, and “companies dependent on Chinese-made components have halted production” to lexicalise and appropriately illustrate how the supposed economy boosters are being grounded underscores the crumbling posture of the economy. Similar strategies are deployed in text 9, while the editor concludes by pontificating that “a global recession is becoming ever more likely as the virus spreads worldwide”, having cited the unprecedented dent the situation has recently had on “all major economies” across the world: “the European Union”, “East Asia”, and “the United States”, all of who are combatting the virus, using all their economic strength with no immediate hope of recouping. Yet, the infection keeps growing and exploding in many other countries. In text

10, the editorial portrays the virus using “inevitable adverse economic impact of the raging coronavirus pandemic.” Hence, the inevitability of the portending effect of the economic adversity incriminates COVID-19 as a cankerworm already propelling the world economy into shambles.

Threat to Humans

The newspapers construct COVID-19 as threat – an expression of intention to inflict evil, injury, or damage – to humans. This representation (with 11% of the identified representations) is evident in texts 11–12.

- (11) What has altered is the nature of the threat. Covid-19 is 50 times more deadly than swine flu. It is far more easily transmitted. The world is more globalised, heightening the risk of rapid spread of the virus, especially one that travels with close contact (*The Guardian*, March 31, 2020).
- (12) Washington should look at what is happening in the US and realise that this is not a time for one-upmanship. Instead of trying to use the pandemic as a means to segregate China from the international community, it should embrace our shared identity as humans in the face of this common threat (*China Daily*, March 26, 2020).

The newspapers converge to paint COVID-19 as a threat to the existence of man, especially since it is capable of inflicting evil, injury, or damage. In texts 11–12, the editorials of the sampled papers deploy such discourse structures as actor description, lexicalisation, burden illustration, evidentiality and number game, to support the representation of COVID-19 as a threat to humanity. As a case in point, text 11 commences with Actor Description to talk about the nature of COVID-19, described as a threat in “What has altered is the nature of the threat. COVID-19 is 50 times more deadly than swine flu”, deploying Number Game, spiced with call to action by the leaders to immediately do the needful to placate the evil virus. The demonisation of the virus as evil and its criminalisation instill the need for caution and vigilance in the mind of the citizenry to either cooperate with the government and health providers and or protect themselves from an impending global threat, since the virus is further given Actor Description as being “far more easily transmitted”. The description further cautions travellers and implicates them as potentially more vulnerable thus: “The world is more globalised, heightening the risk of rapid spread of the virus, especially one that travels with close contact”.

Text 12 implicates the virus as not just a threat, but a common threat to all humans. It commences by deploying the discourse structure “Burden” thus: “Washington should look at what is happening in the US and realise that this is not a time for one-upmanship” in order to canvass for oneness for humanity to defeat the common threat – the epidemic eruption that requires instant reprisal. *China Daily* ideologically negatively implicates the US government’s show of arrogance and untimely segregation, implying that the US leadership was “trying to use the pandemic as a means to segregate China from the international community” since the COVID-19 had started wreaking havoc on the US. *China Daily* further deploys Norm Expression to categorically state what it expected of the US at a period like

this – “it should embrace our shared identity as humans in the face of this common threat”, castigating the virus as a common threat to all humanity.

Warfare

Warfare implies struggle between competing entities or an activity undertaken by a political unit (as a nation) to weaken or destroy another. The newspaper editorials perceive and describe COVID-19 as a war (with 10% of the identified representations) to be fought, as evident in texts 13–15.

- (13) Mr. Trump has proclaimed himself a “war president.” Why, then, won’t he rally Americans around this cause? Winning this war will require shared sacrifice, and tremendous short-term hardship for Americans. But failure would mean devastating loss of life and prolonged, widespread economic pain (*NYT*, March 24, 2020).
- (14) Britain has finally declared war on Covid-19. Ministers say that the science left them no alternative but to fight. This was never a war of choice. The virus is no ordinary foe (*The Guardian*, March 17, 2020).
- (15) The war against the virus is one we all have to fight together, the longer the pandemic persists the worse its effects will be (*China Daily*, March 26, 2020).

Texts 13–15 deploy different ideological discourse structures including Authority, Actor Description and Metaphor to represent COVID-19 as war or warfare. The expressions “Winning this war”, “war on COVID-19” and “The war against the virus” in texts 13, 14, and 15 respectively, implicates and metaphorically presents COVID-19 as war, stating it is a battle to be fought and won by all. First, text 13 uses Authority to take recourse to the pronouncement of the US president, and uses Actor Description to describe him as a self-acclaimed “war president”, capable of leading the war against COVID-19. The unveiled question, “Why, then, won’t he rally Americans around this cause?” is a subtle condemnation strategy strategically positioned in the editorial to query the president’s lethargy and indecisive pace in prosecuting the war. The last sentence presents the consequential projected effect on Americans should the president continue to delay in swinging to action. Similarly, text 14 subtly attacks the lateness of the leadership of Britain in going to war against COVID-19 as suggested by the word “finally”. The text equally underscores the compulsion of the war, “This was never a war of choice”. Text 15 advocates oneness in the battle “we all have to fight together,” and expounds the need for urgency in the war thus: “the longer the pandemic persists the worse its effects will be”. Hence, COVID-19 is a battle; it is a war that all nations must come together to fight earnestly.

Killer (Disease)

COVID-19 is represented as a killer – something that terminates or ends the life of another. Any potential killer is perceived as a criminal. The lexical item ‘kill’ is used by the newspapers to represent COVID-19 as a killer (with 6% of the identified representations) as exemplified in texts 16–18.

- (16) Covid-19, the disease caused by this new virus, appears to be between seven and 20 times more deadly than seasonal flu, which on average kills between 300,000 and 650,000 people globally each year. But that fatality rate could prove to be much lower, especially if it turns out that many milder cases have evaded detection (*NYT*, February 29, 2020).
- (17) The Guardian view on the Covid-19 strategy: insuring against a killer (*The Guardian*, March 31, 2020).
- (18) However, while the world may have witnessed many wars and outbreaks of killer diseases, the Covid-19 has presented a challenge unlike any other before (*The Punch*, March 20, 2020).

The representation of anything or anyone as a killer implicates criminalisation and or demonisation. Texts 16–18 lexicalise, criminalise and demonise COVID-19 as a killer using lexical items such as “kill”, “deadly”, “fatality”, and “killer”. To underscore the representation of COVID-19 as a killer disease the discourse structures actor description, evidentiality, lexicalisation and burden are deployed. Texts 16 gives a further description of the virus, using evidential figures 300,000–650,000 of minimum potential victims of other COVID-19-related viruses as the basis for argument, thereby criminalising and demonising COVID-19 to emphasise that the earlier everyone is conscious of the potential evil of the virus the better. Meanwhile text 17 only warns all on the need to be insured “against a killer”. Text 18 also activates the use of Burden and Comparison to argue that COVID-19 cannot be compared with other “outbreaks of killer diseases”, and argue that all should consciously see COVID-19 as a “challenge unlike any other before.” Hence, everyone needs to be conscious of the “killer”.

Plague

The newspapers also represent COVID-19 as a plague (4% representation). A plague is a disastrous evil or affliction or an epidemic disease causing a high rate of mortality, and has characterised COVID-19 already reported to have claimed numerous lives.

- (19) We’ve been down this road before, too many times. In the 14th century the Black Death provoked mass violence against Jews, Catalans, clerics and beggars; when syphilis spread in the 15th century, it was called variously the Neapolitan, French, Polish and German disease, depending on who was pointing the blame; when the plague struck Honolulu in 1899, officials burned down Chinatown. And so on, down to our times,

when epidemics like Ebola, SARS and Zika fueled animus toward specific regions or peoples. Here we are in 2020, with Asians being assailed across the United States and around the world as purported sources of the “Chinese flu”, the “Wuhan coronavirus” or simply the “foreign virus”. Once again, a mysterious, fast-spreading and sometimes lethal disease is exacerbating racism and hatred — only now with the help of the potent megaphone of social media. (*NYT*, March 23, 2020).

- (20) Not much is known about COVID-19 as experts are still gathering information about the virus. All hands should be at the plough; apart from mobilising all health professionals like Lagos and many countries who have recalled retired care givers, student doctors and other volunteers, other states and the government should follow and mobilise all segments of the society to confront this plague (*The Punch*, March 24, 2020).

The representation of COVID-19 as a plague is very close to its representation as a pandemic or epidemic. However, the choice of the word “plague” resonates more with Christians or Bible scholars who are more conscious of the dastardly effect of a plague. This representation is therefore both informational and a plea for them to swing into action. The representation was only projected by *NYT* and *The Punch* newspapers. Text 19 commences with the use of historical reference as Burden, Evidentiality and Comparison to substantiate the argument and represent what similar plagues had done in the past, comparing them with COVID-19 and establishing the view that they share “plagueness” in common. Hence, COVID-19, as a “plague” that it is, is a “fast-spreading and sometimes lethal disease”. Text 20 only makes reference to COVID-19 requesting all hands to be on the deck “to confront this plague”.

(Man’s) Common Enemy

An enemy is someone that is antagonistic to another or who seeks the other’s injury. Enemy (3%) representation has been used to describe COVID-19.

- (21) Boris Johnson’s declaration of war on an invisible, elusive and advancing foe was long overdue (*The Guardian*, March 24, 2020).
(22) The virus is a common foe (*China Daily*, March 18, 2020).

Only *The Guardian* and *China Daily* have used “enemy or foe” to refer to COVID-19. The portrayal of COVID-19 as a man’s common enemy underscores the fact that COVID-19 is a cog in the wheel of man’s progress. The use of “common” underlines the need for man to come together in unison to combat the virus that is seeking the injury or fall of all. Meanwhile, text 21 still uses a subtle reprimand to allege that the British Prime Minister, Boris Johnson should have declared the virus as an enemy earlier than has just been done.

Fire

Fire, which is a severe trial or ordeal, controls 2% of the total representations. COVID-19 is also represented as fire.

- (23) Here Comes the Coronavirus Pandemic: Now, after many fire drills, the world may be facing a real fire (*NYT*, February 29, 2020).
- (24) There is still a chance that Covid-19 will prove to be more fire drill than actual fire (*NYT*, February 29, 2020).

The representation of COVID-19 as fire is only found in *NYT*. Using the discourse structure, Comparison, texts 19 and 20 compare between fire drill and a real fire or actual fire. In essence, COVID-19 is metaphorically represented as not just a fire but the real fire or actual fire that all need to be wary of. This representation of COVID-19 as a severe trial or ordeal demonises COVID-19 and calls all to action.

Disaster

Disaster – a sudden misfortune bringing great damage, loss, or destruction – has been correlated with COVID-19 in the newspapers. The representation of COVID-19 as a disaster is one of the least (2%) representations as exemplified in text 25.

- (25) For those already suffering from war and other disasters, the prospect of the worst is almost unthinkable (*The Guardian*, March 17, 2020).

Again, only *The Guardian* newspaper conceives COVID-19 as a disaster. To the editor, if the people and the government see COVID-19 as a disaster, they will be more cognizant of the need to deal with it headlong. Text 25 uses Comparison to canvass that the impending disaster of COVID-19 is worse compared with war and other disasters. The other disasters are small compared with the misfortune, damage and destruction that COVID-19 is set to unleash.

Representations and Participants: Implications

COVID-19 has been variously represented as outbreak, pandemic, economic cankerworm, threat to humans, war, killer, plague, common enemy, fire and disaster. Different intentions subsist for the various representations. The central motive behind the various representations is to cognitively task the readers and the masses in general about the potential evil of COVID-19. COVID-19 is embodied as a disease that: spreads suddenly; spreads over a whole country or the whole world; affects people's behaviour; inflicts evil, injury, or damage to humans; weakens or destroys humans; terminates the life of its victims; causes a high rate of mortality; seeks human's injury; burns to death; and brings great damage, loss, or destruction. These various representations converge to demonise and criminalise

COVID-19. Therefore, this is an invitation to humans (discursively referred to as participants) to swing into action, assume different positions and roles to confront the “demon” and “criminal”.

Three different types of participants therefore evolve from the discourse. The participants include the state/health professionals, non-carriers of COVID-19 and carriers of COVID-19. The representations put the state (government) and the health professionals in the position of authority to come together to solve the problem already created by the onset of the virus, while the carriers and non-carriers are expected to obey the directives given by the government as advised by the health practitioners and professionals.

The different representations given to COVID-19 in the newspapers have diverse physical and psychological implications and intentions. The representations have a converging appeal to the cognitive, affective and psycho-motor domains of participants, conveying the need for unanimity by the three participants for success to be ascertained. The various representations further underscores the need: to battle the pandemic earnestly; for all to be wary of their actions in order to contain and curtail the spread of the virus; that all should behold the looming disaster if there is no cooperation to clip the pandemic from truncating the economy; to tackle the disease before it tackles humans.

The state and health practitioners are represented as the major solvers of the virus, while the health practitioners are represented as the carers. The state is expected to lock down and enforce lockdown to contain the spread, provide hospitals and other equipment like ventilators to treat carriers, create isolation centres for carriers, provide stimulus or palliatives to cushion the effect on the citizens, and so forth. The state is also expected to collaborate with the health professionals to massively test citizens, treat carriers, trace contact and research on vaccine. The editorials consistently deploy ideological discourse structures like Authority, Burden, Evidentiality and Comparison to refer to countries that have made a remarkable progress based on harmonious confrontation of the virus, as evident in text 26.

- (26) But there is no question that the W.H.O.’s approach works better. Every region that has managed to get a coronavirus outbreak under control has succeeded thanks to a combination of social distancing and aggressive efforts to test as many people as possible. South Korea, for example, has tested some 274,000 people since February. The United States has tested just 82,000, the vast majority of them in the past few weeks (*NYT*, March 24, 2020).

In text 26, *NYT* uses W.H.O. as the authority to support its position, using both Burden and Evidentiality to argue out its position and citing the experience with South Korea as a ground, example and Illustration for America and others to follow in a bit to combat the pandemic. While this is a sort of call to action to the state, it is equally a condemnation strategy to query their lethargic pace in following the working example of South Korea. This also suggests to (potential) carriers the need for self-guard.

- (27) But it takes political decisiveness to lock down a city or area. And it takes doctors, nurses, sickbeds, testing kits, breathing machines, medical oxygen, plus large amounts of disinfectant, surgical masks, protective overalls and goggles each day, to give purpose to the lockdown (*China Daily*, March 26, 2020).
- (28) Around the world, authorities are being forced to make difficult and complex decisions in this crisis. Mass quarantines of the kinds seen in Wuhan, China and Italy, may not be the only or even the best approach; it appears aggressive testing and contact tracing with some social distancing measures have been effective in countries including Singapore and South Korea (which has been testing 20,000 people a day) (*The Guardian*, March 12, 2020).

Texts 27 and 28 also suggest other roles expected of the state, including lockdown, contact tracing, aggressive testing of the citizens, citing the example of Wuhan, China as the approach which assisted in timely containment. Although the total or partial lockdown has its attendant negative consequence, including economic stagnancy, economic melt-down, occupational denial, hijack of jobs, denial of freedom, house arrest and so forth, it is better off for early containment on the long run. Text 29 also suggests that all the participant-roles will not really be as effective as discovering a vaccine that will ultimately help to solve the problem. Of course, this is a role expected of health professionals, which also relies on funding by the state.

- (29) No matter how effective wearing face masks, washing hands, self-quarantining and social distancing are in preventing people from being infected with the novel coronavirus, a vaccine will ultimately be the most effective solution (*China Daily*, March 18, 2020).

The non-carriers are represented as potential victims and spreaders of COVID-19. The non-carriers, who are potential victims and spreaders, are expected to abide by the directives of the government and health practitioners. Hence, they are required to collaborate with the state in distancing socially (spatially); disinfecting surfaces around; maintaining healthy lifestyle by consuming healthy food, engaging in regular exercise and sleeping well; coughing or sneezing into bent elbow; disposing of used tissue; washing hands with soap & running water; sanitising one's hands regularly; protecting self & others against droplets; not touching mouth, nose, and eyes; wearing nose/protective mask; staying home/safe; not panicking and consuming immunity boosters, as evidently expressed in samples 30 and 31.

- (30) No matter how effective wearing face masks, washing hands, self-quarantining and social distancing are in preventing people from being infected with the novel coronavirus, a vaccine will ultimately be the most effective solution. That explains why President Xi Jinping emphasised the importance of science and technology in the fight against

the virus in a signed article published in Qiushi Magazine on Monday (*China Daily*, March 18, 2020).

- (31) Since coronavirus has no known cure, prevention remains the best form of defence. A highly contagious disease, people have been warned to stay away from crowded places and to avoid unnecessary contact. The United States Centres for Disease Control and Prevention says the best protection is to wash hands often with soap and water for at least 20 seconds. People have also been advised to keep a distance from sick people and to “avoid touching your eyes, nose or mouth with unwashed hands”. When coughing, tissues should be used to cover one’s mouth. It is expected that most people who suffer from coronavirus may eventually recover on their own; but the CDC advises that the symptoms should be treated. Those mildly sick are advised to drink a lot of liquid and observe adequate rest (*The Punch*, January 30, 2020).

The emphasis on social distancing has to do with a reduction in or totally stopping physical contacts with others. Socialisation has to do with societal or communal involvement of a people. It could also relate to interactants in a social sect. The editorials deploy ideological discourse structures like Authority to represent the virus as anti-social. The activation of social distancing among all humans as authorised by the WHO indexes COVID-19 as anti-socialisation, that is a breaker of socialisation. Although Abel and McQueen (2020) query the correctness and grammaticality of “social distancing”, and suggest “spatial distancing” in its place, the concept of distancing is still of essence. Of course I agree with the stance of Abel and McQueen that we need to project more of spatial distancing than “social” since communication via the phone and other non-physical means can still be termed “social”. Even this discursal incongruity has been further spread and projected by the W.H.O., represented in text 32 thus:

- (32) The World Health Organization, for weeks now, has been making an emphatic plea to countries around the world: Social distancing is crucial to stopping the spread of coronavirus (*NYT*, March 19, 2020).

The actual carriers, whose cases may be mild or non-mild, are the real spreaders of COVID-19. While the mild carriers, also referred to as asymptomatic carriers, may not immediately display symptoms, the non-mild carriers display symptoms within the first and fourteenth day of having contact with a carrier or (super-)spreader.

- (33) Symptoms, according to the World Health Organisation, include fever, cough, shortness of breath and breathing difficulties. In severe cases, it could lead to pneumonia, SARS, kidney failure and death (*The Punch*, January 30, 2020).

As spelt out in text 33 and others, and as authorised by the WHO, some of the symptoms of COVID-19 are itchy/dry throat, dry cough, high temperature, fever,

fatigue, body aches, shortness of breath, loss of smell/taste, and so forth. Carriers are therefore expected to collaborate with the state to isolate from others, cooperate with carers, consume immunity boosters, and so forth.

Conclusion

This study on COVID-19 set out to examine selected newspaper editorials across four continents/countries in the world in order to identify how the virus and associated participants are represented in newspapers globally. The analysis was guided by aspects of van Dijk's (2006c) socio-cognitive model of critical discourse analysis on ideological discourse structures. The selected COVID-19-related editorials of newspapers (*New York Times*, *The Guardian*, *China Daily* and *The Punch*) which cut across the USA in North America, the UK in Europe, China in Asia and Nigeria in Africa were subjected to quantitative and discourse analyses. The newspapers largely set the agenda on the negative representation of the disease and its potential havoc on all facets of human endeavours, thereby giving emotional and informational appeal to all to join hands in earnestly silencing the epidemic.

The study revealed that the newspaper editorials unusually converged to negatively represent an issue – COVID-19 – because it is largely negatively viewed by all. The newspaper editorials variously represented COVID-19, using ten representational strategies: outbreak, pandemic, economic cankerworm, threat to humans, war, killer (disease), plague, common enemy, fire and disaster. Different intentions subsist for the various representations, just as differences are observed in the newspaper representations. All the newspapers converge to represent COVID-19 as outbreak, pandemic, economic cankerworm, threat to humans and war; whereas there were observed differences in the representations of COVID-19 as killer (disease), plague, common enemy, fire and disaster. The representation as plague was only projected by *NYT* and *The Punch* newspapers; the representation as man's common enemy was only used by *The Guardian* and *China Daily*; only *NYT* represented COVID-19 as fire; and only *The Guardian* newspaper conceives COVID-19 as a disaster.

The representational strategies were developed by the newspapers with six discourse strategies, including demonising the disease, criminalising the disease, calling the state to action, emotional and informational appeal to the masses, condemnation of the state, and historical reference. To the reader's cognition, therefore, the implication is that of consciousness on the evil effect of COVID-19 and the need to cooperate with the state and health workers to checkmate its evolution. Consequently, the represented human participants have different roles to play in safeguarding the globe. While the state and health professionals are represented as major problem-solvers and carers, the (non-)carriers are represented as (potential) victims and or (super) spreaders who must perform different containment roles, including social distancing (preferably, spatial/physical distancing); staying at home to stay safe from the virus; wearing a nose/mouth mask; keeping clean hands with soap and alcohol-based sanitizer regularly; sneezing or coughing into a

flexed elbow or a disposable towel; avoiding touching of the face, especially mouth, eyes, and nose; avoiding touching surfaces, among others in order to collectively combat the virus. Both the COVID-19 and human representational strategies were also reinforced through the deployment of twelve ideological discourse structures: actor description, authority, burden, comparison, evidentiality, illustration, generalisation, lexicalisation, metaphor, negative other-presentation, norm expression and number game.

Therefore, this paper argues that the reporters and the newspapers, whose mental models have already been formed by the implicit and explicit information on COVID-19, establish the agenda by positioning their readers' cognition to negatively perceive coronavirus (COVID-19). The ten representations give adherence to the agenda-setting prowess of the media. The negative portrayal, demonising and criminalising COVID-19, alongside other constructions, as identified with the discourse tools, goes a long way in creating a cognitive awareness in the minds of the citizenry, bringing consciousness to the readers on the negative capability and destructive strength of the life-threatening disease.

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Topics on Sociology

The Outbreak of Coronavirus (COVID-19) Plagues the World

Guy Bäckman

The focus is on the outbreak of COVID-19 and the patterns inherent in it as they appear in valid statistics and current research. The approach relies on overall goals and strategies in combating the spread of the virus. The examination is placed within an interdisciplinary frame of reference, particularly social policy and economics. A primary and crucial goal of social policy is to ensure, within prevailing economic frames, equity and social justice in the pursuit of sustainable development. The new coronavirus (COVID-19), which was first detected in December 2019 in Wuhan, China, has been declared a global emergency by the World Health Organization, as the outbreak continues to spread outside China. As of the beginning of October 2020, the number of reported COVID-19 cases around the world is about 34 million, and the number of deaths amounts to 860 thousand. The worldwide spread of coronavirus is severely affecting the global economy; millions of the global population are under some form of lockdown. The coronavirus pandemic, experienced as a severe shock, has caused not only economic difficulties but also social suffering and concerns for the infected individuals and their families, relatives and closest acquaintances. Increased concern, in connection with the economic slowdown, have given rise to new policies to combat the spread of the new coronavirus never before seen in humans. The policy actions range from social distancing that allow people to work online at home to the closing of borders. In the new emergency conditions, the values and goal orientations emphasize life and health as fundamental human rights. In addition to increased care provisions, other policy actions, such as relief package designed to ensure economic activities and the welfare and well-being of individuals and families, telemedicine, remote work and smart devices are used to enable visiting other people in order to return to normal. Although science guided by humanistic principles, has provided the knowledge to portray the state of the world and human conditions, the preparedness for combating the coronavirus pandemic and the treatment of people infected with the virus, have been found to vary among nations. Significant access barriers remain, especially in remote areas, including the cost of data as well as lack of understanding of foreign languages to manipulate devices and understand internet content. International responsibility and solidarity appear as primary guiding principles in connecting all policy actions to combat coronavirus.

Keywords: *advanced technology, global economy, relief package, social distancing, access to data, social suffering, solidarity*

The Rapid Outbreak to a Worldwide Pandemic

The coronavirus, which was first seen in December 2019 in Wuhan, China, has quickly spread around the world. The focus is on the outbreak of COVID-19 and the patterns inherent in it as they appear in valid statistics and current

research. The approach relies on overall goals and strategies in combating the spread of the virus (WHO 2020a, Armstrong et al. 2020). This examination is placed within an interdisciplinary frame of reference, particularly social policy and economics. A primary and crucial goal of social policy is to ensure, within prevailing economic frames, equity and social justice in the pursuit of sustainable development. Economics in hard times depend on social policy measures for new development (Banerjee and Duflo 2019, Sen 2010).

As of the beginning of October 2020, the number of confirmed COVID-19 cases around the world is about 34 million, and the number of deaths amounts to 1 million, and according to statistics from Johns Hopkins University, US, the number of confirmed cases is increasing all the time. The World Health Organization (WHO) on March 11, 2020 declared COVID-19 a pandemic, pointing to the rapidly increasing cases of coronavirus infections around the world and the sustained risk of further global spread (Worldometer 2020). The worldwide spread of coronavirus is severely affecting the global economy; millions of the global population is under some form of lockdown. The International Labor Organization (ILO) further estimates that 25 million jobs could be lost due to the coronavirus (ILO 2020a). Coronavirus (COVID-19) cases continue to rise rapidly across the African continent (WHO 2020b). In these parts of the world, the structures which characterize life (economic, social political and ecological) are different requiring well-adjusted policy actions. The potential for coronavirus to spread to countries with weaker health systems is a huge concern. Countries in Africa and in Southeast Asia are witnessing increasing fears of escalating coronavirus cases, as also in Russia and Eastern Europe. The outbreak has also reached the Nordic countries, where the total number of confirmed cases is lower than in other parts of Europe. The fight against coronavirus has paralyzed society and the economy. ILOs' most pessimistic scenario is that the observed increase in COVID-19 cases worldwide forces to continue restrictions that would slow recovery. The scenario estimates job losses of 340-400 thousand (ILO 2020b, 2020c). The outbreak of coronavirus has resulted in directives and recommendations from authorities to people to protect themselves and to reduce the interaction that people have in order to minimize their chances of picking up the virus. Nowadays, society is more than ever immersed in a flow of technological innovations that shape our interactions and mediate our access to goods and services and to other individuals. The development of artificial intelligence, robotics, which in times of globalization and economic and social transformations, has led to analyses of the discontent of globalization (Stiglitz 2018) and to a "globo-tech upheaval" (Baldwin 2019, pp. 4-5). The Internet of Things (IoT) device market is on the rise. The worldwide number of IoT connected devices is projected to increase to 43 billion already by 2023. With almost 2.5 billion monthly active users in the middle of 2019, Facebook is the biggest social network worldwide. Significant access barriers remain, especially in remote areas, including the cost of data as well as illiteracy and lack of understanding of foreign languages to manipulate devices and understand internet content.

Social distancing as an infection control method among actions, ranging from, for example, prohibitions on gathering in larger crowds or crowded spaces to the closing of borders. This also refers to crowded or overcrowded spaces were people

are living and functioning (WHO 2020a, Papanikos 2020). People are allowed to work from home instead of in the office; schools are closed or switched to online classes, and communication with other people. The authorities are nowadays delivering information electronically. Barriers, however, to get access to data particularly exist in remote and poor areas. Changed circumstances with many restrictions have resulted in uncertainty in the business world; investments are not made or they are postponed. Private consumption is also changing. People have shifted to shopping online instead of visiting crowded places, shopping malls and supermarkets. The demand for health and hygiene products has especially increased, while consumption attracting attention or conspicuous consumption has no priority, i.e., consumption used to indicate economic status and accomplishments (Veblen 1953). Comparisons can be made with earlier presented ideas whether we live in a “joyless” and not in a “joyful” society, where comfort and pleasure clarify how people in different ways are in pursuit of satisfaction and thus happiness and wellness (Scitowsky 1992, p. 59). In the event that a longer period of restrictions is required to contain covid-19, the damage to the economies would be greater. The council of European Union has adopted recommendations on the gradually lifting of the restrictions of non-essential traveling into EU (European Union 2020). According to forecasts (e.g., OECD 2020, p. 6), economic activities and global growth will markedly decline in 2020. The outbreak of coronavirus has particularly damaged economic activities and growth in the large economies, China and the US, which are the engine of growth, commanding a majority of the global wealth. The gloomy development has caused further fiscal stress because of already expanded welfare commitments, which will even continue because of demographic shifts (Bäckman 2020, p. 102).

Policy Actions for Securing Health and Life

The coronavirus pandemic, experienced as a severe shock, has been a social burden causing not only economic difficulties but also social suffering for people because of stagnation of economic activities and mass layoffs. Recovery of the economy from the corona pandemic has led to much discussion among different experts and also in social media. The crucial issue is that we do not know exactly how the pandemic will play out (Anderson et al. 2020). The main task facing the world right now is stopping the spread of the coronavirus. But even when the global public health crisis is under control and the global supply chain disruptions caused by covid-19 end, many large companies will experience uncertainty because it seems to be difficult to determine when business will return to normal. The idea of social distancing is difficult to realize in populous countries, where a huge number of people live in low quality, semi-permanent structures, slums. Concerning the government and scientific directions it is pointed out that social distancing, for example, in India and at the African continent is very challenging (WHO 2020b). The Indian government issued a comprehensive advisory statement on coronavirus (COVID-19) on 16th March 2020, directing states across the country to take social distancing measures as a preventive strategy (Bhatt 2020). Until a vaccine is available, there is a need for actions on a broad front. The science, particularly

because of progress in advanced technology and algorithmic solutions increasingly portrays the state of the world and human conditions, and reliable knowledge can be received for policy design. Efforts to develop an effective vaccine for COVID-19 are being made. Although a vaccine has already been tested on animals, an effective vaccine to protect people from coronavirus could be produced within a timeframe of at least a year (Ahmed et al. 2020). People who have recovered from infectious disease like covid-19 are generally left with blood that can be used to fight off a virus. Preparatory findings show the potential of such a blood transfusion (convalescent plasma) to treat patients with novel COVID-19 (Duan et al. 2020). As the Nobel prize-winning economists, Abhijit V. Banerjee and Esther Duflo, have emphasized, good economics in hard times require actions on a broad front of social policies (2019, pp. 262, 318; see also Mohan 2015, p. 125). It has been considered important to place social arrangements and opportunities in social policy within the frame of life satisfaction and happiness (Sen 1999, Easterlin 2006). As well as economic sustainability improves the level of living, the environmental justice and sustainability also secure not only public health and public safety, but even welfare and well-being. The developing countries are, however, in an insoluble dilemma, how to achieve and maintain sustainability without international help. Bail-out policies, i.e., financial help to countries in severe crisis and on the cusp of failure, to ensure that measures are done when it is economically necessary and in line with rules of bail-out principles and strategies of a world view based on facts (Rosling 2019).

Health policy and other policy actions to prevent transmission from symptomatic and non-symptomatic cases, are flattening the epidemic curve, changing it to a more normal distribution. The greater the reduction in transmission, the longer and flatter the epidemic curve, with the risk of resurgence because of changed behavior and customs among people or because different policy actions are set up. Through different restrictive policy actions, aiming to protect people, especially those with diseases like cancer, diabetes, heart problems and old people, cancelling large gatherings, restricting travel, increasing remote work and other measures, the epidemic curve can be flattened. Many countries have the implementation of relief packages on their policy agendas to stimulate economic activities and to contribute to the well-being of the labor force. The strategic preparedness and response plan, released by WHO on 3rd February 2020 outlines the public health measures that the international community is prepared to provide to support all countries to make provision for and respond to coronavirus. The document provides guiding principles for strategic policy actions (WHO 2020a). In the US, a \$2 trillion coronavirus relief package has been designed to support the economy. The policy actions on a broad front aim to stop the outbreak of coronavirus and get a recovery started. Bias in the models used for calculating the effects of implemented restrictions to address all problems in connection with the outbreak of coronavirus, increases the risk that the policy actions will not work according to the original plans, and a new wave of resurgence will emerge. During a resurgence period, the new curve is reshaped extending rightwards. After strong policy actions, the coronavirus pandemic will probably level off and the curve will flatten into a new shape. The way out from the hard times that the pandemic has caused, can either take a V- or a U-shaped form. After a bottom level is reached, a

V-curve indicates successful policy actions and that a recovery process is rapidly beginning. A prolonged period of problems at the bottom of the U-curve continues before an upward slump starts again (OECD 2020, Carlsson-Szlezak et al. 2020).

Advanced Technology in a New Role

In the new circumstances, social policy and economics are pushing the boundaries further to promote freedom and opportunities, and to find optimal and cost-effective solutions to the choices for maintaining well-being in accordance with prevailing and preferred values. The use of advanced technology is, however, accompanied by risks and tensions for both service providers and users (Wright 2020). The advanced technology has already made great progress in the developing and designing of thinking and speaking robots to reduce involuntary loneliness and social isolation among, for example, sick children who cannot take part in school education (Sheffield 2017). The use of robots supplementing, or replacing, for example, therapists and social workers, does not perhaps provide the expected values attached to services in the form of human contact and a confidential relationship (Atkinson 2015, p. 117, Mohan 2018, p. 43). This development, mostly good but also bad, supports the decisions concerning social distancing during the continuous outbreak of coronavirus. Remote work as a new working style had been on the increase before the outbreak of coronavirus. During the coronavirus pandemic, people are allowed to work at home. Remote work enables a continuation of economic activities and maintenance of welfare. The progress in the development of artificial intelligence for newer and more advanced applications like emotional communication is entering a new era of computer-mediated remote touch, where it is possible to exchange expressions of feelings, for example, through hugs. The advanced technology may be ready to provide emotional support and hugs for people who are far removed from each other (Block and Kuchenbecker 2019, Mok 2018). As a result of increased education in techno-sciences, researchers have devoted research capacity to finding solutions to support humans through robot hugs. Information and ideas are spread like neurons in brain cells, contributing to a continuing connectedness to prevent idleness and social isolation (Goertzel 2016, p. 587, Christian and Griffiths 2016). The importance of remote touch is also emphasized as a tool in therapeutic work, which particularly is actualized in periods of exceptional times. When artificial intelligence is used to identify emotions, it can have negative consequences such as misunderstandings and dissatisfactions (Purdy and Daugherty 2017). As a consequence of the rapid and revolutionizing development of advanced technology, telemedicine also referred to as telehealth or e-health will become more common, and information on its potential in care is frequently shared in social media (Goertzel 2016, Cooper and Matsuzak 2020). Telemedicine allows health care professionals to evaluate, diagnose and treat patients in remote locations using telecommunications technology. Telemedicine allows patients in remote locations to access medical expertise quickly, efficiently and without travelling. Thus, telemedicine provides convenience and cost-effective medical care. Telemedicine is fast becoming integrated into the daily operations of hospitals, specialty departments, home health agencies, private physician offices

and the homes and workplaces of health care consumers around the world. In the globalized world telemedicine can help match medical care practitioners in the developed world with patients in the developing world, far from hospitals, let alone medical specialists (Cooper and Matsuzak 2020). Smart phone applications for “contact tracing,” i.e., to identify people who by chance are in the same physical place at the same time with a contagious patient, have been developed for use in some countries and are reported to be in further development, especially through the introduction of 5G networks revolutionizing new effective applications in smart cities (Dave 2020, Weeber 2020). Apple and Google have invested a great deal in launching a series of updates to their smartphone operating systems that will use Bluetooth signals to track potential coronavirus cases. Cybercrime is increasing, and cybercriminals may target data from public services and other institutions, as well as private information. Cybercrime conducted by hackers may paralyze the infrastructure or parts of it. Attacks that damage or put vital functions of society out of action, such as oil and gas, electricity, transportation, telecommunications etc. have serious consequences (Wirtz and Weyerer 2017, Baldwin 2019, p. 185). Technostress appears when people are forced to deal with streams of information, and computer addiction may exist among heavy users. Marginalization of the non-digital population, i.e., persons not able to adapt to rapid changes, has become apparent (World Economic Forum 2019).

Summary and Further Thoughts

The focus is on the outbreak of COVID-19 and the patterns inherent in it as they appear in valid statistics and current research. The approach relies on overall goals and strategies in combating the spread of the virus. As of the beginning of October 2020, the number of reported COVID-19 cases is about 34 million and the number of deaths is about 1 million around the world. The analysis is placed within an interdisciplinary frame of reference, particularly social policy and economics. A primary and crucial goal of social policy is to ensure, within prevailing economic frames, equity and social justice in the pursuit of sustainable development. The worldwide spread of coronavirus is severely affecting the global economy, millions of the global population are under some form of lockdown. In accordance with the core idea that life and health are fundamental human rights, policy actions have been taken, ranging from social distancing, that allow people to work online at home to closing of borders. Private consumption is also changing as people shift to shopping online instead of visiting crowded places. Consumption attracting attention or conspicuous consumption is not given high priority; the demand for health and hygiene products has, however, increased. People equipped with communication devices have possibilities to arrange help in their everyday life, such as having their shopping brought to them.

Electronic communication with people in poor and remote areas is not easy because of lack of computer devices and inability to manage advanced communication.

During the difficult times of the coronavirus pandemic, economic activities are being stimulated by governmental relief packages; for example, the US has

announced relief stimulus of \$2 trillion amid growing coronavirus fears. In times of crises good policies also include, in accordance with prevailing and preferred values, maintaining an adequate level of preparedness and risk management strategies. Based on advanced technology and algorithmic solutions, science increasingly portrays the state of the world and human conditions, and reliable knowledge can be received for policy design. The fast-spreading disease is likely to come to a halt as a V- or U-formed curve depending on how successful all the policy actions for “flattening the coronavirus curve” are. Some countries have, however, started to lift restrictions too early, implying risks for a new wave of coronavirus cases. According to reported plans and decisions from some countries to lift restrictions, the visible signs of the decrease in the severity of the coronavirus pandemic, as measured by death rates, has influenced decisions. The coronavirus death rate, however, takes into account milder cases. These estimates, without enough etiological facts, are therefore crucial to enable countries around the world to best prepare policy actions to curb the global coronavirus pandemic. All countries have not, however, succeeded to stop the outbreak of coronavirus and to protect people and their health.

The advance in technology has contributed to the mitigation of unwarranted economic and social suffering, while the progress has been of great help in planning and decision-making for increasing the effectiveness and optimal performance of policy actions. Technological change is widely regarded as one of the main drivers of long-term economic development, while the technological innovations have had far-reaching effects on people’s everyday life. The restrictions, fears and uncertainties have resulted in a changed pattern of contact and relations between people.

The most important result is that a new view of solidarity as a community connectedness and togetherness has emerged. This is also a new way to receive social support in the strenuous circumstances caused by the coronavirus pandemic. There are, however, great differences in access to broadband connections and use of the internet. A digital divide exists between individuals who have access to information and communication and those who lack access. Digital divide is obvious between less economically developed countries and more developed countries. Discrepancies are observed in different socio-economic groups and social-cultural contexts. Ecological issues including waste-related problems and climate change are much in focus and a matter of urgency. Global waste is estimated to increase to 3.4 billion tons by 2050 from around 2 billion tons in 2016, the greatest increase is projected to be produced in Asia and sub-Saharan Africa. People who are living near rubbish dumps or searching for things from such places, are endangering their health and well-being. Significant access barriers remain, especially in remote areas, including the cost of data as well as illiteracy and lack of understanding of foreign languages to manipulate devices and understand internet content. The outbreak of COVID-19 and its consequences have much been discussed in scientific circles, for example, in webinars. The crucial issue is, how to achieve and maintain inclusive growth, i.e., equitable opportunities for the populations.

The economy and the technology are embedded in everything when seeking ways to contribute to sustainable social policy and development. Fiscal stress, due

to demographic shifts, has already put pressure on the welfare systems. For the governments this means a challenge to adapt policy design within the economic frames. An aging population, with far-reaching economic and social policy consequences, is increasingly apparent in many industrialized nations across the world. Intergovernmental cooperation facilitates the achievement of policy goals for management of diseases and crises. Social justice, solidarity, and equal values are guiding principles. According to forecasts, the global growth is estimated to be weak in 2020. In the advanced economies it also seems to be difficult to boost the worsened economic activities, reflecting the outbreak of the coronavirus pandemic, as well as worldwide tensions and crises, such as geopolitical tensions and conflicts in trade policy. The coronavirus pandemic has changed the world, and how to respond with policies of “hybrid strategies” to create differentiation in policy actions and to gradually lift restrictions. The European Union has adopted recommendations on the gradually lifting of the restrictions of non-essential traveling into EU. The ability to accept new visions and directions in further policy design of preparedness to meet crises and disastrous diseases is associated with good governance in partnership with all interested parties, both internationally and nationally. Policies oriented towards further development must above all be given high priority because today’s decisions will have long-term consequences.

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The Demographics of COVID-19 in the European Union

Gregory T. Papanikos

This paper provides provisional descriptive evidence to answer two questions which relate to deaths due to COVID-19 in EU countries. First, to what extent variations in population sizes matter in EU countries? Can variations in deaths per capita (or people infected per capita) be explained by variations in population sizes? Second, does the economy matter? Can variations in total and per capita GDP explain variations in deaths per capita? Related is the issue of social spending. Can social spending explain variations in COVID-19 impacts? In answering these questions, data from EU member states are used. Simple stepwise descriptive statistical analyses show that population sizes and economies do matter in explaining the observed variations in COVID-19 impacts. It is found that only deaths per capita give meaningful and statistically significant results. This relation is non-linear. On average a one percent rise in population size increases deaths per capita by 0.49%.

Keywords: COVID-19, European Union, population, GDP, per capita GDP, social policy

Introduction

Never before in history world population was so large, so old, so much travelling across the globe and so interconnected via technology. In the last millennium, the world has witnessed tremendous population growths despite the positive and preventive checks that so eloquently have been examined by Malthus in his famous book on *An Essay on the Principle of Population* first published in 1798. There is no doubt that technology has been the primary factor explaining this unprecedented growth in global population especially vaccines and human capital which has increased personal hygiene practices (Lee 2003).

Over the last centuries, these population upsurges have occurred in the midst of (a) catastrophic wars, (b) famines, and (c) natural disasters. The latter include lethal contagious diseases. But as Malthus (1798, p. 110) remarked these did not affect the population because of "... the greatest proportion of births to burials, was in the five years after the great pestilence". In other words, population losses were recovered in few years.

The same was highlighted by Thucydides in his book *The Peloponnesian War*¹. Ten years after the plague, which struck Athens in the summer of 430 BCE,

¹I have examined elsewhere the Ancient Plague of Athens in comparison with the current pandemic; see Papanikos (2021). Similarly using a simulation model, Court and McIsaac (2020) concluded that in case of collapses, their model responded with higher than usual birth rates resulted in larger and younger population. It seems that this is the case with the current pandemic given the disproportionate effect on older populations.

was forgotten, population rose sufficiently to support with fresh fighters a military expedition to Sicily and with a sufficient rise in public revenue.

Presumably the ancient pestilence did not affect as hard the young generation. Only 15 years had elapsed since the plague which was more lethal during its second and last wave of 427 BCE. Those born after the plague would have been less than 12 years old at the time of the war in Sicily and could not serve as soldiers. This prompts the conclusion that those who were children at the time of the Plague of 430-427 BCE were not infected as much as older people otherwise would not have survived to join the ranks of the Athenian army. I mention this because relates to unequal impacts that pandemics may have on population in terms of age and gender.

This paper looks at demographic impact of COVID-19 in European Union (EU). My interest is policy oriented. The EU members may take a collective action to fight the pandemic or any future contagious disease and implement a common social policy. These policies are simply mentioned in the fourth section of this paper. In the following two sections, I compare the number of people infected and deaths of the pandemic in the EU member states in terms of their population sizes and age structure (section two) and its association with the size of EU economies and social policy spending (section three). The final section concludes.

My analysis here is basic. I use descriptive statistical tools to examine the issues and questions concerning this paper. I do not provide any literature review of the social and economic impact because this has been done in a paper I have already mentioned and another paper which looked at economic and tourism impacts of COVID-19 on Greek economy².

To What Extent Population Sizes Matter?

Data on total people infected (cases) and the number of people died from COVID-19 were retrieved from the World Health Organization (WHO); it includes deaths and cases reported as of 31 May 2020 (<https://covid19.who.int/>). Population and economic statistics are retrieved from Eurostat (<https://ec.europa.eu/eurostat/web/national-accounts/overview>). The most recent available data on population, GDP and social policy are used as of 31 May 2020.

Table 1 reports basic statistics of all 27 countries which are members of EU: total population, total number of people infected, total number of people infected per million of population, total number of people died by the disease, total number of people died per million of population, and the death per cases ratio.

A few comments on data limitations are in order here. The number of cases reported has been very controversial not only in EU countries but in other countries as well. The total number of people infected is underreported because does not include all those who were infected and for various reasons were never tested, e.g., lack of medical resources, no symptoms etc.

The death statistics are more reliable but even these possibly are underestimated. People who died outside the health system (hospitals and clinics) may not be

²Based on scenario analysis, economic and tourism impacts were found to be unprecedented for non-war period; see Papanikos (2020).

counted as victims of the pandemic. In any case, the issue here is whether these data biases differ between the EU countries. For the cases this may be true. However, the death variable may measure intra-EU variations more accurately. I will concentrate more on death variations, which, for all practical purposes, are more important. Those who were infected and survived may be a gain to society if they have become immune to the disease.

Table 1. Total Population, Case and Deaths in the European Union Member States

Country	Population (2020 estimate)	Deaths	Cases	Deaths per Million People	Cases per Million People	Deaths per Cases
Belgium	11542	9453	58186	819	6155	0.1625
Bulgaria	6939	140	2513	20	17950	0.0557
Czechia	10710	319	9230	30	28934	0.0346
Denmark	5843	571	11633	98	20373	0.0491
Germany	83270	8500	181482	102	21351	0.0468
Estonia	1331	67	1865	50	27836	0.0359
Ireland	4962	1651	24929	333	15099	0.0662
Greece	10652	175	2915	16	16657	0.0600
Spain	47217	29043	239600	615	8250	0.1212
France	66945	28717	148436	429	5169	0.1935
Croatia	4054	103	2246	25	21806	0.0459
Italy	60314	33340	232664	553	6979	0.1433
Cyprus	890	17	943	19	55471	0.0180
Latvia	1908	24	1065	13	44375	0.0225
Lithuania	2790	70	1670	25	23857	0.0419
Luxembourg	632	110	4016	174	36509	0.0274
Hungary	9752	524	3867	54	7380	0.1355
Malta	516	7	616	14	88000	0.0114
Netherlands	17482	5951	46257	340	7773	0.1287
Austria	8921	668	16638	75	24907	0.0401
Poland	37922	1061	23571	28	22216	0.0450
Portugal	10274	1396	32203	136	23068	0.0433
Romania	19294	1253	19133	65	15270	0.0655
Slovenia	2097	108	1473	52	13639	0.0733
Slovakia	5461	28	1521	5	54321	0.0184
Finland	5530	316	6826	57	21601	0.0463
Sweden	10373	4395	37113	424	8444	0.1625

Source: COVID-19 from WHO (<https://covid19.who.int/>) and all others from the European Union (<https://ec.europa.eu/eurostat/web/national-accounts/overview>).

By looking at the raw data of Table 1, there appears to be huge differences between countries with similar populations. For example, Austria, Belgium, Czechia, Greece, Hungary, Portugal and Sweden, with a population of about 10 million people, have reported different impacts on total number of people died from the disease: 668, 9453, 319, 175, 524, 1396 and 4395 respectively. From the surprisingly low statistic of Greece of 175 deaths as of 31 May 2020 to the huge and unexpected number of 9,453 reported by Belgium.

On the other hand, Germany and France -the two countries with the largest populations in EU-, have reported striking different numbers of deaths. Germany with a population of 83 million people reported 8.5 thousand deaths while France with 67 million population had three times higher this number (28,717). The picture looks the same if other variables reported in Table 1 are examined.

Table 2 reports summary statistics of all variables in Table 1. As of 31 May 2020, the average number of deaths in the 27 EU member nations was 4,741 people with a positive skewness.

Table 2. Summary Statistics

Statistic	Population (2020 estimate)	Deaths	Cases	Deaths per Million People	Cases per Million People	Deaths per Cases
Mean	16579	4741	41208	169	2002	0.069
Median	8921	524	9230	57	1234	0.047
Maximum	83270	33340	239600	819	6359	0.194
Minimum	516	7	616	5	274	0.011
Std. Dev.	22300	9603	70915	221	1757	0.049
Skewness	2	2	2	2	1	1.059
Kurtosis	5	6	5	4	3	3.006

Italy holds the disappointment record of over 33 thousand deaths in total and 889 deaths per million of population. The minimum total was recorded by Malta (7) but per population the minimum was recorded by Slovakia of 5 deaths per million people.

Tables 1 and 2 show large differences in the death/cases ratio. But, as explained above, this may reflect the inaccurate record of cases. France, Italy, Sweden, the Netherlands and Spain which have higher death/cases ratio may be an indication of better recording the cases but countries with low rates may as well show better provision of hospital services. This important issue goes beyond the scope of this study.

The above evidence, based on raw data, may be misleading and the underlying relationship between the size of population and the number deaths may be statistically stronger. A scatter diagram of the two variables of deaths per capita and total population is shown in Figure 1.

Larger countries were hit harder relative to smaller countries. But a careful look at Figure 1 shows that this relationship is not linear. Also, there is a cluster of small countries with population less than 10 million people. But even this sub-section shows a negative relationship.

To ascertain non-linear effects, a regression equation was estimated of deaths per population as a function of total population. The results are reported in Table 3. The regression results show that population size does have an impact on the deaths per capita.

Three estimations are reported. Firstly, a logarithmic specification shows that there is positive relation between deaths per capita and population. The elasticity is 0.49. A 1% increase in population size is associated with 0.49% increase in the number of deaths per capita. The relationship is positive. Higher populations increase the number of deaths per capita.

Figure 1. Deaths per Capita and Total Population

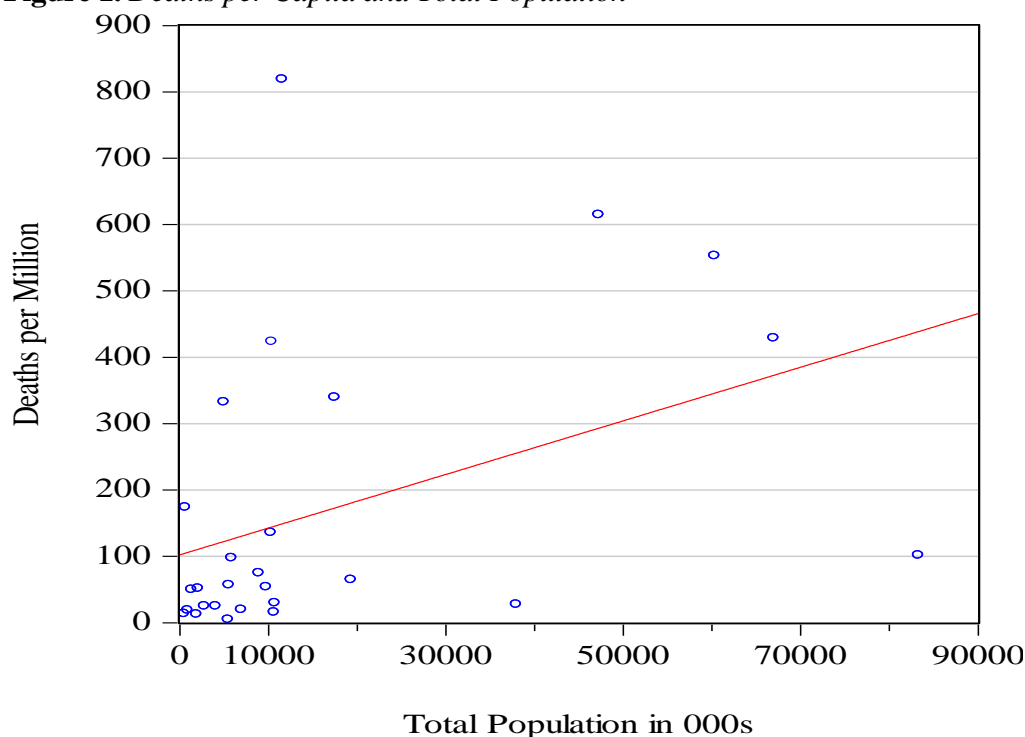


Table 3. Regression Results of Deaths per Million of People

Explanatory Variables	Log (Deaths per Capita) (1)	Deaths per Capita (2)	Deaths per Capita (3)
Constant	-0.044 (-0.02)	-720.6 (-0.67)	23.93 (0.54)
Log (Population)	0.49 (3.0)		
Population		0.3294 (2.74)	0.017 (2.21)
(Population) ²			-1.73E-07 (-1.8)
Adjusted R-squared	0.2029	0.1334	0.2253
F-statistic	7.62	5.01	4.78
Prob(F-statistic)	0.01	0.03	0.02

t- values in parentheses (a t-value above 1.8 shows that the coefficient is statistically significant at 10% level). White heteroskedasticity-consistent standard errors & covariance estimates are reported.

Secondly, a linear model on levels also shows a strong positive relation between deaths per capita and total population. However, as shown in the last column of Table 3, the relationship is non-linear. A rise in total population increases deaths per capita at a decreasing rate.

Another interesting result is given by the coefficient of determination adjusted for degrees of freedom. In the logarithmic specification, the variation in the log of population explain 20.29% of the variations of the log of deaths per capita. In the linear and non-linear specifications, the coefficient of determination is 13.34% and 22.53% respectively.

The relationship between cases per capita and total population was not statistically significant in all three model specifications. Results are not reported. In addition, the age structure of population was not statistically significant either. I used total and percentages of population over 65 years old and under 14 years old. Either variable was not statistically significant. This might relate to the aggregation of data. It quite possible that at the regional level the age structure may play a role. Kashnitsky et al. (2020) examined age convergence using regional EU level data. They found a strong relation between age and economic convergence. Thus, regions do matter in analyzing age structure of population. Finally, population density or the area of the country was not statistically significant either.

Summing up, the results of this section, the answer to the question “to what extent population sizes matter?” is yes. The higher the population of an EU country, the higher the death rate; the latter is measured as the number of people died from COVID-19 per million of population. Why is this the case was not answered in this paper. Possible explanations could be that higher populations imply higher concentrations of populations and higher probabilities of spreading the disease.

This picture may be incomplete if we do not look at the size of the economies of the EU countries. The next section of this paper looks at aggregate economic impacts taking into consideration the findings of this section and controlling for the effect of population sizes.

Does the Economy Matter?

The 27 EU member states belong to the group of countries which can be called developed or relatively rich countries. However, great variations do exist within EU. From an economic point of view, large economies (those which produce a higher than average level of GDP) and rich countries (those with relatively high per capita GDP) do make a marked difference. Table 4 reports raw data on total and per capita GDP for the 27 EU countries.

One of the characteristics of the economy of the EU countries is different sizes. Small economies such as Malta, Cyprus, Estonia, Latvia, Slovenia, Lithuania, Croatia, Bulgaria, Luxembourg and Slovakia of less than 100 billion euro of GDP coexist with large economies Germany (3.4 trillion €), France (2.4 trillion), Italy (1.8 trillion) and Spain (1.2 trillion €). In the middle there are medium sized economies of higher 100 billion € and lower one trillion €. Almost half of the EU economies (13) are in the middle.

This is very important because the COVID-19 has had so far, a greater impact on long-term economic prospects of an individual country and an overall impact on the EU countries since their economies are integrated especially those which at the same time are members of the eurozone.

Table 4. GDP, Per Capita GDP and Social Spending of the 27 European Union Member States, 2019

Country	GDP (millions €)	GDP per Capita (in €)	Social Spending (% of GDP)
Belgium	473085	41195	20.7%
Bulgaria	60675	8678	12.1%
Czechia	220201	20632	14.5%
Denmark	310937	53438	17.9%
Germany	3435210	41336	17.9%
Estonia	28037	21117	13.5%
Ireland	347215	70373	8.7%
Greece	187457	17500	21.8%
Spain	1245331	26401	19.4%
France	2425708	36330	23.6%
Croatia	53937	13251	15.3%
Italy	1787664	29627	24.9%
Cyprus	21944	24925	15.0%
Latvia	30476	15941	12.8%
Lithuania	48433	17344	15.3%
Luxembourg	63516	102343	18.9%
Hungary	143826	14720	12.3%
Malta	13277	26523	9.8%
Netherlands	812051	46804	11.4%
Austria	398682	44905	19.5%
Poland	529029	13939	16.9%
Portugal	212319	20661	18.2%
Romania	223337	11503	13.4%
Slovenia	48007	22962	17.8%
Slovakia	94171	17266	16.1%
Finland	240078	43485	20.2%
Sweden	474148	46128	13.5%
Average EU	515880	31457	16.3%
Median EU	220201	24925	16.1%
Standard Deviation EU	815553	20750	0.04

Source: <https://ec.europa.eu/eurostat/web/national-accounts/overview>.

However, one expects a time lag of this impact. The lockdown of 2020 cannot affect the GDP of 2019. And this makes the interpretation of the simple regression results very difficult. The question though here is not if the COVID-19 will have a negative impact on the economy and how severe will that be but whether the large economies of the EU were hit harder. The hypothesis is whether the higher the total GDP, the higher the deaths per million people.

Table 4 shows the distribution of per capita GDP between the 27 EU countries. As was the case with the observations with total GDP, so with per capita GDP the EU countries can be categorized into three groups of equal size of nine countries.

The richest group of EU countries with a per capita GDP of more than 40 thousand euro in 2019 were: Luxembourg, Ireland, Denmark, Netherlands, Sweden, Austria, Finland, Germany and Belgium.

The poorest group of countries (with a per capita income less than 20 thousand euro) were: Bulgaria, Romania, Croatia, Poland, Hungary, Latvia, Slovakia, Lithuania and Greece.

Between 20 and 40 thousand per capita GDP were the countries of Czechia, Portugal, Estonia, Slovenia, Cyprus, Spain, Malta, Italy and France.

The average economy of EU had a GDP of 515 billion. The median value was 220 billion euro which shows the skewness of the distribution of total GDP between the 27 EU countries as this is also portrayed by the high standard deviation of 816 billion euro.

Per capita GDP is not as disperse as total GDP but variations do exist. The average per capita GDP is 31.5 thousand euro, the median is 24.9 thousand and the standard deviation is 20.6 thousand euro.

Social spending as a percentage of GDP does show variations but are not as huge as the variations in GDP and per capita GDP. It seems that the EU countries have harmonized their social spending even though it belongs to national authorities to adjust their social spending.

How do all these economic variables impact on the deaths due to COVID-19? Table 5 reports regression results of an extended simple model which in addition to population now includes economic variables.

Many specifications were tried but they were not given statistically meaningful results. For example, the logarithmic specification was not statistically significant. This might be explained by the non-linearity of deaths per capita and the economic variables of total GDP and GDP per capita.

Table 5. Regression Results of Deaths per Population of an Extended Model

Dependent Variable: Deaths per Million of Population				
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
C	564.2439	462.4751	1.220052	0.2354
Per Capita GDP	11.66524	5.934804	1.965564	0.0621
(Per Capita GDP) ²	-0.092133	0.051239	-1.798094	0.0859
Social Spending-% of GDP)	-9778.335	4636.092	-2.109176	0.0465
(Social Spending-% of GDP) ²	34110.32	13076.45	2.608532	0.0160
R-squared	0.416792	F-statistic		3.930602
Adjusted R-squared	0.310754	Prob(F-statistic)		0.014827
		Prob (Wald F-statistic)		0.000002

White heteroskedasticity-consistent standard errors & covariance estimates are reported.

Also, the size of population and GDP are correlated and this creates a problem of multicollinearity. The effect of these two variables cannot be ascertained separately. Instead, per capita income is used as an explanatory variable of deaths per capita.

Total deaths instead of per capita deaths give different statistical results. The GDP variable was not statistically significant. Table 5 reports the regression results of only a model of statistically significant coefficients. Per capita income and social spending as percentage of GDP were used as explanatory variables. The effect of both variables is non-linear.

Table 5 shows that economic variables do matter. It seems that the economies which were hit the hardest were the richer countries of EU. Countries with higher than average GDP per capita recorded higher than average deaths per capita but at

a decreasing rate. On the other hand, social policy spending does matter. Countries with higher spending reported lower number of deaths per capita.

In concluding, the economy does matter. The richer the country, the higher the deaths per capita. On the other hand, the higher the social spending as a share of GDP, the lower the ratio of deaths to population. It seems that social policy does work and EU countries should consider coordinate and consolidate a common policy. This issue is briefly discussed in the next section of this paper in light of the current pandemic.

A Common EU Policy to Fight the Current Pandemic

The members of EU are not obliged to follow a common social policy and to that extent any policy which relates to public spending on education, health and welfare. Over the years this has created two problems.

The first is ideological. There is no doubt that the European Civilization has been at the forefront of what one may call an anthropocentric society. Never before and nowhere today the humanity has reached such levels of civilization as in EU. And this must be cherished by all European countries. Despite the differences shown by some countries which in statistical terms can be considered outliers, the European Civilization is the best humanity ever had. It is at the highest point of a steep mountain where at the top lies the ideal society. The European civilization is not perfect but it is the best. A demonstration of such a superior civilization is the treatment of all kind of minorities included those people who suffer more from the current pandemic. The European Union has not shown the solidarity which one would expect from its superior civilization. Ideology relates to politics and the latter to democracy.

Pandemics affect political and social processes at least in the short term over the political cycle. Haffoudhi and Bellakhal (2020) have related democracy to age structure and demography. COVID-19 has had a differential age structure effect and this might have repercussions on the political process in the EU countries. Also, as Krieger and Meierrieks (2020) population size is positively related with government size. If this is the case, then EU countries with larger population which were hit harder with the COVID-19 may expect political instability and pressure as they will account the government responsible for the impact.

Related to this issue of democracy and politics is the fertility rate of women. Sommer (2018) using a sample of 140 countries found growth in democracy when fertility declines. A future study should examine how countries which differ in fertility rates and therefore in the role of women in politics have performed in terms of social policy and coping with the pandemic.

The second is economics. Countries who spend more on social policies which in some cases might include minimum wages financed by higher tax rates and less investment credits put themselves in a disadvantageous position than the other countries of EU that use a curtailment of social benefits as a means to promote short-run economic growth objectives.

Both reasons are important. I do not suggest an increase or a decrease in social policy spending. What I do suggest is that the European Union must decide what kind of society it wants and once this decision is reached, then it must be applied to all countries. If some countries do not follow, they must not be part of the European Union; spiritually at least.

The current pandemic has sown the lack of a common policy to face the economic and social problems. Countries under panic started to take measures without consulting each other creating a deplorable situation. However, I must stress that relative to U.K. and USA, the European Union looks like a paradise. And if for the EU there is an excuse because 27 countries must coordinate their actions after a common decision is taken, for the other areas of the world there is no excuse. Table 6 reports comparative data of the EU, UK, Canada and USA. With exception of Canada, USA and U.K. have scored below the EU average.

Table 6. *Comparative Summary Statistics of EU, U.K., Canada and USA*

Area or Country	Population	Deaths	Cases	Deaths per Million of People	Cases per Million of People
EU	449641	128007	1112611	285	2474
U.K.	67192	38376	272830	571	4060
Canada	36475	6996	89741	192	2460
USA	333245	101567	1716078	305	5150

Finally, on the 13 May 2020, the EU took a number of initiatives which are stated in four documents (European Commission 2020a, 2020b, 2020c and 2020d). In what follows in this section, I make a few notes on them.

In my earlier paper (Papanikos 2020), I indicated that the important issue was to reach a common decision to lift the variations in the lockdown policies. What is missing from these documents is the emphasis on the demand side of the equation or the consumer behavior. As long as countries report even a single case of infection, people will not resume traveling or undertake any other outdoor activity such as dining and shopping.

There is a demographic side to this story. Given the evidence that the disease hit disproportionately the older people, then governments must increase their spending targeting this age group. This might require a rationalization and restructuring of health services. Currently there is no common health policy even at the level of absorbing excess demand shocks. This is a research question which needs further investigation: how health expenditures affected the deaths and cases of COVID-19.

The recent discussion at the EU level to spend billions of euro to revitalize the economy to get out of the upcoming deep recession is towards the right direction. I consider it necessary but not sufficient. The EU must take common social policy measures which will include health provision. The EU has established a European University in 1972 even though the provision of education at all levels are regulated by each national government of member states.

I would like to see that extended to health provision. For example, I would like to see a top research oriented gigantic hospital with thousands of beds which will serve the European Citizens. One of its statutory obligations is to absorb

excess demands at the EU level. It will work the same way as an insurance market. The larger the population, the lower the cost.

In the current pandemic, such as a European Hospital would have provided the facilities for a widespread testing, isolation of those affected, contact tracing and quarantine of those contacts. Given that the spread was a pan-European one, a European common action would probably have prevented the loss of lives and the mass lockdowns.

Conclusions

Population size and the economy do play a role in explaining variations in deaths due to COVID-19 in EU countries.

A one percent increase in population size is associated with 0.49% increase in the number of deaths per capita. But the relationship is non-linear. More populated countries were hit harder by COVID-19 but the rate of impact decreases as population size increases.

On the other hand, the economy does matter. The richer the country, the higher the deaths per capita. On the other hand, the higher the social spending as a share of GDP, the lower the ratio of deaths to population.

It seems that social policy does work and EU countries should consider coordinate and consolidate a common policy.

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Google Trends as a Method to Predict New COVID-19 Cases and Socio-psychological Consequences of the Pandemic

Tado Jurić

Understanding how people react to the COVID-19 crisis, and what the consequences are of the COVID-19 pandemic is key to enable public health and other agencies to develop optimal intervention strategies. Because the timely identification of new cases of infection has proven to be the key to timely respond to the spread of infection within a particular region, we have developed a method that can detect and predict the emergence of new cases of COVID-19 at an early stage. Further, this method can give useful insights into a family's life during the pandemic and give the prediction of birth rates. The basic methodological concept of our approach is to monitor the digital trace of language searches with the Google Trends analytical tool (GT). We divided the keyword frequency for selected words giving us a search frequency index and then compared searches with official statistics to prove the significations of results. 1) Google Trends tools are suitable for predicting the emergence of new COVID-19 cases in Croatia. The data collected by this method correlate with official data. In Croatia search activities using GT for terms such as "PCR + COVID", and symptoms "cough + corona", "pneumonia + corona"; "muscle pain + corona" correlate strongly with officially reported cases of the disease. 2) The method also shows effects on family life, increase in stress, and domestic violence. 3) Birth rate in 2021 will be just 87% of what it would be "a normal year" in Croatia. 4) This tool can give useful insights into domestic violence. Unquestionably, there are still significant open methodological issues and the questionable integrity of the data obtained using this source. The fact is also a problem that GT does not provide data on which population was sampled or how it was structured. Although these open-ended issues pose serious challenges for making clear estimates, statistics offer a range of tools available to deal with imperfect data as well as to develop controls that take data quality into account. All these insights show that GT has the potential to capture attitudes in the broad spectrum of family life themes. The benefit of this method is reliable estimates that can enable public health officials to prepare and better respond to the possible return of a pandemic in certain parts of the country and the need for responses to protect family well-being.

Keywords: *Google trends, COVID-19, birth rates, domestic violence, Croatia, predicting demographic trends, family*

Introduction

In the absence of medical treatment and vaccination, the mitigation and containment of the ongoing COVID-19 pandemic rely on behavioural changes. Timely data on attitudes and behaviours are thus necessary to develop optimal intervention strategies and to assess the consequences of the pandemic (Perotta et

al. 2020). A key problem is a lack of data to assess people's and thus family's behaviour and reactions to epidemics. Decision-making and the evaluation of non-pharmaceutical interventions require specific, reliable, and timely data not only about infections but also about human and family behaviour. We seek to narrow this data gap by monitoring individual and family behaviours in response to the COVID-19 pandemic in Croatia. We used Croatia as a case study because the country is an extremely interesting case of studying the consequences of the pandemic on family life. After all, it was the first EU member state, to experience two strong earthquakes (March and December 2020; SSOC 2020a, 2020b), in addition to the pandemic. This further affected the spread of the pandemic and increased risk factors in families and which increased death rates. Furthermore, there are no studies of this type (digital demography) in Croatia and the wider region of Southeast Europe. When it comes to the use of the Internet, Croatia is generally comparable to the EU average so the results of this study can be compared with other EU countries. Here it is important to briefly mention that Google search engine is the most popular search engine in Croatia, preferred by 97.21% of users (StatCounter 2020), similar to EU level (92.92%; Jurić 2021b, d).

The COVID-19 outbreak and lockdown accelerated the adoption of digital solutions at an unprecedented pace, creating unforeseen opportunities for scaling up alternative approaches to social science (Hantrais and Lenihan 2021). We will show that GT has the potential to capture attitudes in the broad spectrum of family life themes. These insights can be very useful to understand and predict some behaviours in the field of public health and for monitoring families but also for predicting new COVID-19 cases in a specific area. The basic methodological concept of our approach is to monitor the digital trace of language searches with the Google Trends analytical tool¹.

After briefly showing the results of relevant studies in digital demography in the next section, in section 3 we will give a brief overview of the spread of coronavirus in Croatia. This overview is important for the comparison of results that we received with GT with official results. The next section shows how this method can predict the increase in new cases of infection in a particular region promptly and enable the public offices to act accordingly with additional measures. Then, we show how GT can be used as a method to predict the socio-psychological impact of the pandemic in Croatia on families and growth indicators of domestic violence during the pandemic in Croatia. We end the article with Google Trends indicators about the consequences of the COVID-19 pandemic on the fertility rate in Croatia in the year 2021.

1 that there are still significant open methodological issues and the questionable integrity of the data obtained using this source (see Cesare et al. 2018), which we will discuss in more detail in the section methodology.

¹trends.google.com.

How Analysing Google Searches Can Support COVID-19 Research

Online searching is often where people come to get answers on health and wellbeing, whether it's to find a doctor or treatment center or understand a symptom better just before a doctor's visit (Gabrilovich 2020). The pandemic accelerated the uptake of digital solutions in data collection techniques (Sogomonjan 2020). Livingstone (2020) portrayed digital technologies being harnessed to support public health responses to COVID-19 worldwide. In the short term, face-to-face survey interviews were replaced by online interviewing, and by turning to other data sources. This direction of travel had to be abruptly scaled up as it became the "new normal" for data collection and dissemination (Hantrais et al. 2020). Artificial intelligence (AI) correctly predicted the spread of COVID-19 before anybody else (Niiler 2020). AI was used extensively and in various forms in the context of COVID-19 (COE 2020). AI applications were introduced to track the pandemic in real-time, to predict accurately where the virus might appear next, and to facilitate the development of an effective vaccine (Sogomonjan 2020). AI was capable of processing vast amounts of unstructured text data to predict the number of potential new cases by area (Vaishya et al. 2020) and to forecast which types of populations would be most at risk, while also assessing, evaluating, and optimizing strategies for controlling the spread of the epidemic (Kritikos 2020).

In the past, researchers have used Google Search data (in the USA, Germany, Italy, etc.) to gauge the health impact of heatwaves, improve prediction models for influenza-like illnesses, and monitor Lyme disease incidence (Gabrilovich 2020). Google Trends makes available a dataset of search trends for researchers to study the link between symptom-related searches and the spread of COVID-19 with the aim of a better understanding of the pandemic's impact². According to Fox (2006) and Ginsberg et al. (2009), web search queries are a uniquely valuable source of information about health trends. A set of Yahoo search queries containing the words "flu" or "influenza" were found to correlate with virologic and mortality surveillance data over multiple years (Polgreen et al. 2008). According to Bousquet et al. (2017), GT may predict the outbreak of many diseases. In Germany, correlations between the patient-based, combined symptom medication score (allergy) and GT data are stronger than those with the regionally measured pollen count data (Konig and Mosges 2014; see Marques et al. 2016). Google search interests can also be used to predict the number of asthma-related emergency department visits in the area (Ram et al. 2015, Bousquet et al. 2017). The project by Google Trends, Schema, and Axios shows how searches became more specific as infections of COVID-19 spread across the United States (Kight 2020).

By looking at Google Trends search data related to the COVID-19 pandemic, we can discover patterns in our desire for information - waves of interest that reflect the pandemic's progression and our understanding of it. Researchers could use this dataset to study if search trends can provide an earlier and more accurate indication of the re-emergence of the virus in different parts of the country, but they also can be useful in studying the secondary health effects of the pandemic (Gabrilovich 2020). Ferguson et al. (2005) show that early detection of disease

²See searchingCOVID19.com/ 2020.

activity when followed by a rapid response, can reduce the impact of both seasonal and pandemic influenza.

This method has proven to be very useful for gaining insight into several other fields of research, such as the consequences that a pandemic and the measures associated with it have on the mental health of the population (see results). The restrictions to movements, events, and relations left serious consequences on the mental health of many individuals and family lives (Bruno 2020). In the short term, while protecting vulnerable individuals (the frail and the older adult) from the epidemic, they increase the risks of loneliness and therefore mental health issues (Hossain et al. 2020).

Previous studies have shown that public health emergencies may affect health, safety, and well-being. These effects may translate into a range of emotional reactions (such as distress or psychiatric conditions), and unhealthy behaviors (such as excessive substance use) (Pfefferbaum and North 2020). Uncertain prognoses, personal freedoms, large and growing financial losses, and conflicting messages from authorities are among the major stressors that will undoubtedly contribute to widespread emotional distress and increased risk for psychiatric illness associated with COVID-19 (Pfefferbaum and North 2020). Much of these results, although they were made predominantly in the USA, applies also to Croatia. During the first half of 2020, 37% more misdemeanors and as much as 57% more criminal offenses were recorded in Croatia than in the same period in 2019. The Ombudsman Office of the Gender Equality in Croatia states that during the isolation due to the pandemic, it recorded an increased number of complaints of domestic and partner violence³.

Historically, economic crises have never been the preferred period for a couple to decide to have a baby (Matysiak et al. 2020). The results of Luppi et al. (2020) show that fertility plans have been negatively revised in all countries, but not in the same way. According to our method, in Croatia, the birth rate in 2021 will be just 87% of what it would be “a normal year”.

The share of Internet users has increased significantly since 2009 when the first studies of this type were conducted, so the insights that can be obtained in this way are today much more reliable. By mid-2020, 58% of the world population was estimated to be internet users, compared to almost 90% in the European Union (StatCounter 2020, Jurić 2021b). Within the EU, the same study showed that usage ranged from nearly 98% in Denmark to less than 70% in Bulgaria - in Croatia (81%) (Eurostat 2020)⁴. Eurostat data show that 19% of citizens in Croatia have never used the Internet, while the EU average is 11% (Eurostat 2020, Jurić 2021b). According to data from the Central Bureau of Statistics (DZS) from 2019, 82% of households in Croatia have access to the Internet. The data show that when it comes to the use of the Internet, Croatia is generally comparable to the EU average. As the age increases, so does the percentage of citizens without any experience in using the Internet. That is most people who do not use the Internet come from the group over the age of 65, as many as 62% of them. The reasons for not using the Internet in Croatia are mainly reduced to a larger share of the older,

³Gender Equality Ombudsman Croatia 2020.

⁴https://ec.europa.eu/eurostat/statisticsexplained/index.php?title=Digital_economyand_society_statistics_-_households_and_individuals/hr. [Accessed 20 February 2021]

less educated, and poorer population. This is certainly a serious limiting factor for all studies of this type, and care should be taken that almost one-fifth of the population fails to be included in such sampling.

Schwab and Malleret (2020) argued that the world today is “facing a ‘defining moment’ as the pandemic precipitated the fusion of technologies, enabling digital technologies to extend their reach, almost uncontrolled, into every aspect of life. Building on the third digital revolution, the Fourth Industrial Revolution is distinguished from previous industrial revolutions by its ‘velocity, scope, and systems impact’. This Fourth Industrial Revolution would develop exponentially rather than linearly and would ‘fundamentally alter the way we live, work, and relate to one another’ (Schwab, Malleret 2020). At the micro-level, families are shown to have become “digital by default” (Livingstone 2020). Among other indicators in Croatia, this is reflected in the fact that the top three searches in 2020 were related to the growth of interest in applications such as Google Classroom, Zoom, Office 365 for schools (Google Year in Search 2020).

To select the most common terms in our study to be searched, we adhered to WHO (2020a, b) and Croatia official statistics⁵. Infected with COVID-19 may be asymptomatic or develop symptoms such as fever, cough, fatigue, shortness of breath, or muscle aches. A review of 55,924 laboratory-confirmed cases in China showed the following typical signs and symptoms: fever (87.9% of cases), dry cough (67.7%), fatigue (38.1%), sputum production (33.4%), shortness of breath (18.6%), sore throat (13.9%), headache (13.6%), muscle pain or joint pain (14.8%), chills (11.4%), nausea or vomiting (5.0%), nasal congestion (4.8%), diarrhoea (3.7%), haemoptysis (0.9%) and conjunctival congestion (0.8%) (WHO 2020). In Croatia by the onset of the epidemic, we have noticed a sharp increase in searches for several topics related to COVID-19 like “PCR + COVID”, “cough + corona”; “pneumonia + corona”; “dry cough + corona”; “runny nose + coronavirus”; “muscle pain + corona”, “anxiety + depression”, “abortion pill”, etc. Based on these findings, we checked whether the tool can be used for monitoring and predicting new COVID-19 cases and whether this method can be useful in monitoring families.

Methodological Explanation

The basic methodological concept of our approach is to monitor the digital trace of language searches with the Google Trends analytical tool (trends.google.com). The GT analytics application is a trend search tool that shows the popularity of a term when searching on Google, and we can see if a trend is rising or falling. GT does not provide information on the actual number of keyword searches. Instead, it standardizes search volume on a scale of 0 to 100 over the period being examined (see Jurić 2021a, b, c, d) with higher values indicating the time when the search volume was greatest, allowing for verifiable metrics⁶.

⁵koronavirus.hr.

⁶trends.google.com.

To standardize the data, we requested the data for the period from 20 January 2020 to 20 December 2020 (in case of predicting of new COVID-19 cases from 20 January 2020 to February 2021). When we deemed it necessary, we also collected data for longer periods (which is indicated below each figure). We then divided the keyword frequency for selected words giving us a search frequency index. We have then compared searches with official statistics to prove the significations of results (see further explanations by Wilde et al. 2020).

Further, keywords were chosen by brainstorming possible words that we believed to be predictive, specific, and common enough for use in forecasting (we used a similar method in predicting migration from Croatia; see Jurić 2021b, c). After the significance screen, we selected keywords and topics.

Table 1. *Keyword and Topic Selection Criteria*

Symptoms	What is/How to?	Terms	Activities
Asthma	What is coronavirus?	Influenza Complication	Coronavirus testing
Anosmia	What is Zoom?	Cold/Flu Remedy	PCR test
Common cold	How to make a face mask?	General Influenza Symptoms	Application for a minimum wage
Cough	How to make hand sanitizer?	Term for Influenza	
Depression		Symptoms of an Influenza Complication	
Fatigue		Antibiotic Medication	
Fever		Remedies for corona	
Headache		General Influenza	
Nausea		Antiviral Medication	
Shortness of breath			

To understand these terms, a note on the logic behind the Google Trends search algorithm is necessary. Certain delimiters, such as ”, -, and + allow users to change the combinations of keywords searched. A search for a single keyword will yield the search frequency index counting all searches containing that keyword, including searches that contain other words (Wilde et al. 2020).

Limitations

The study we present, as well as all other studies of this type, has important limitations that we want to highlight (see Jurić 2021b). Although previous research in this area has shown the feasibility of using digital data for demography, at the same time we highlight the problems associated with assessments and conclusions (see Zagheni et al. 2017, Zhang et al. 2020, Jurić 2021b, d). Namely, it is unquestionable that there are still significant open methodological issues and the

questionable integrity of the data obtained using the sources of large data sets. Unquestionably, this model has unresolved issues related to the reproducibility of the findings and the validity of the measurements, which arise from the very characteristics of the Google Trends (GT) system used (see Jurić 2021a, b). When using this tool it should be borne in mind that each of these searches was conducted for its reason and does not answer direct questions from researchers. Thus, for example, “googling” the term “coronavirus testing” is not necessarily an implication that someone is ill or experiencing symptoms. The search queries are not exclusively submitted by users who are experiencing COVID-19 symptoms, and the correlations we observe are only meaningful across large populations. However, testing of a similar model used in the U.S. for the onset of influenza showed a high correlation between influenza symptom searches and physical reports of influenza cases (Ginsberg et al. 2009).

The fact is also a problem that GT does not provide data on which population was sampled or how it was structured (Jurić 2021d). Despite strong correlations, this system remains susceptible to false alerts. An unusual event, such as a drug recall for a popular cold or flu remedy, could cause such a false alert (Ginsberg et al. 2009). In Croatia, such an example was observed after complications with vaccination with Astra Zeneca, when interest in vaccination and vaccine types increased sharply. Although these open-ended issues pose serious challenges for making clear estimates, statistics offer a range of tools available to deal with imperfect data as well as to develop controls that take data quality into account (see “R”; see Zagheni et al. 2017). Those problems can be resolved also by triangulation. In results, we show, for example, that the increase in Google search is correlated with the increase in the number of new COVID-19 cases recorded by official statistics and that the decrease in Google search is correlated with the decrease in the number of new cases recorded by official statistics.

The Google search Index cannot estimate the exact number of searches, so with the help of this tool the exact number of new cases cannot be estimated, but the increase of the trend can be noticed very precisely (see Jurić 2021a, b), which can serve as an indicator of new cases in the whole country and individual regions. We tested the method in the Croatia case by comparing the findings obtained with GT with official indicators. We show that the increase in Google search is correlated with the increase in the number of new COVID-19 cases recorded by official statistics and that the decrease in Google search is correlated with the decrease in the number of new cases recorded by official statistics. A particular limitation of this approach is the fact that the demographic characteristics of users cannot be determined, which plays an important role in the context of the suppression of the spread of the infection. The main advantage of this approach compared to official indicators is that it detects the phenomenon as quickly as possible and thus can serve as an early alarm. This is relevant for family life because it has been observed that the virus spreads particularly rapidly in households where more young and old people live together (Esteve et al. 2020). Namely, younger people are more often asymptomatic patients or do not feel great health problems due to infection, which is why they are often unaware that they are infected, and as such represents an extremely great danger for older members of the household.

With the early detection of the spread of the virus in certain parts of the country, measures such as closing cafes, clubs, switching to online classes, etc. can be introduced quickly to take preventive action.

The demographic structure of the country plays an important role in understanding the spread of the infection. Luppi et al. (2020) in their study about the impact of COVID-19 on fertility plans suggest that the possible effect of the COVID-19 epidemic and the subsequent economic crisis cannot be merely interpreted under the same mechanisms in all European countries. Esteve et al. (2020) show the double challenge that countries such as Greece, Italy, Portugal, and Spain face: the combination of an aged population with inter-generational residence leads to high estimated death rates due to COVID-19 but also makes preventing deaths due to within-household transmission of the virus particularly challenging. Evidence shows that the risk of severe disease and mortality increases sharply with age (WHO 2020). “Therefore, the age structure of the population - what proportion are young or old - and the structure of co-residency - how big are households and how old are their members - are two key factors that determine the vulnerability of countries to outbreaks of COVID-19, and how effective general and age-specific household confinement policies can be in reducing mortality after an outbreak” (Dowd et al. 2020). As the virus can be transmitted outside and within households, the effects of such measures will depend on the number of transmissions that take place outside and within the household (Esteve et al. 2020).

Preventing primary infections among the elderly is the most effective in countries with small households and little intergenerational co-residence such as France, whereas confining younger age groups can have a greater impact in countries with large and inter-generational households such as Bangladesh (Esteve et al. 2020). According to this study, Croatia can be classified as a country that shows the characteristics of the spread of infection as in southern Europe⁷. Whereas such studies have not been carried out in Croatia, but the lifestyle in the coastal part of Croatia is very similar to the Italian one, Italian case can suggest how to identify contexts and populations that are particularly vulnerable to aging-sensitive epidemics also in the Croatian case (see Balbo et al. 2020). Those countries are characterized by a higher share of intergenerational co-residence and contacts among generations, i.e., “strong” family ties. While culture plays a role in shaping these differences, also structural factors are relevant (Balbo et al. 2020). While in “normal” times strong family ties are protective for older adults, they become a risk factor during epidemics, and aging-sensitive epidemics in particular (Balbo et al. 2020).

Occurrence and Spread of Coronavirus in Croatia

The first case of SARS-CoV-2 virus infection in Croatia was confirmed on February 25, 2020⁸. One year later, there were 237,725 patients in Croatia. On March 11, 2020, a decision was made in Croatia to declare an epidemic of the

⁷See koronavirus.hr.

⁸koronavirus.hr.

COVID-19 disease caused by the virus⁹. On March 22, 2020, Croatia was hit by an earthquake measuring 5.5 on the Richter scale¹⁰, which is the strongest earthquake in Zagreb after the 1880 earthquake. It is assumed that the consequences caused by the earthquake contributed to the behaviours that contributed to the increase in the number of newly infected in the coming period¹¹.

On April 2, more than 1,000 infections were recorded in Croatia. Due to the increase in the number of patients per 100,000 inhabitants, Croatia was placed at the end of August on the red list of a total of 13 EU countries. The increase in mortality began at the end of August, in mid-October, the death toll rose sharply, and in December Croatia was in fourth place in Europe with a 57% mortality surplus compared to the average of the last five years. Only Slovenia, Lithuania, and Bulgaria had higher mortality rates¹². Two effects affected mortality - the premature death of many individuals who would still live without the virus, and the virus hastened the death of those nearing the end of their lives. In Croatia, COVID-19 in 2020 was the fourth leading cause of death in women and the third in men. Men had a two to three times higher risk of death from COVID in older age groups than women¹³.

Due to the dramatic increase, the government has announced new strict measures to combat the epidemic¹⁴. Measures that affected families were school closures, a ban on visits to nursing homes, and extended confinement of the elderly in their homes. As in other countries, there have been debates about the role that specific age groups, and particularly children, play in the transmission of the virus (see Zimmerman and Curtis 2020).

Most infected were in the north, in Međimurje County, about 10%¹⁵. This fact is important to us because the GT also shows that the search for the mentioned terms was the largest in this region, weeks before the pandemic spread. Since mid-December, the situation has improved significantly and there are fewer active and new cases every day. In the next part of the year, the situation changed, and by January 2021, with just over 1,000 registered cases per million inhabitants, Croatia recorded data like most other countries in the EU¹⁶.

In the first 400,000 people infected with coronavirus, a total of 257 patients died¹⁷. In the 2020 pandemic year, Croatia has the highest number of deaths since the civil records of deaths and excess mortality were monitored, especially during November and December 2020¹⁸. According to preliminary estimates in 2020, 56,677 people died (DZS 2021). At the end of 2020 and the beginning of 2021, there was a strong fall in the number of deaths due to pandemics and newly

⁹zdravlje.hr 2020.

¹⁰pmf.unizg.hr 2020.

¹¹koronavirus, hr, 2020.

¹²ourworldindata.org, 2021.

¹³Čipin 2021.

¹⁴Civilna-zastita.gov.hr 2020.

¹⁵koronavirus.hr 2020.

¹⁶koronavirus.hr 2021.

¹⁷koronavirus.hr 2021.

¹⁸Čipin 2021.

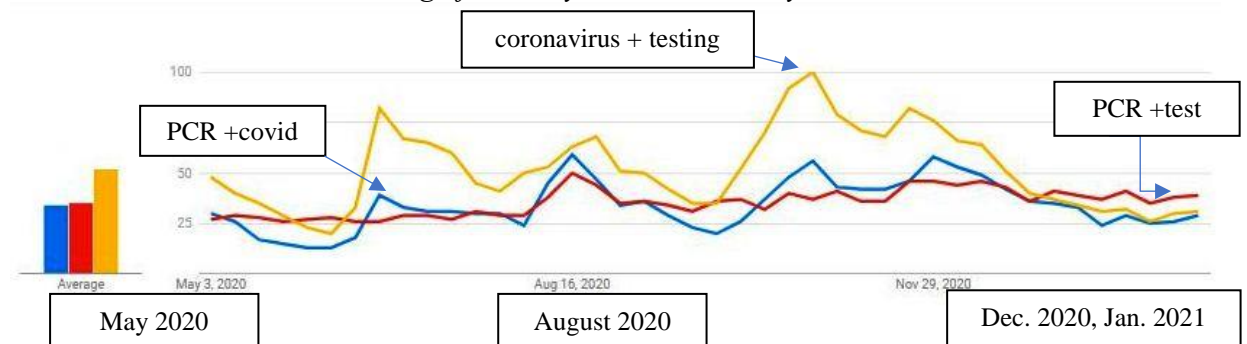
registered cases of infection. In the next section, we show the results obtained with Google Trends.

Results

Google Trends as a Method to Predict New COVID-19 Cases

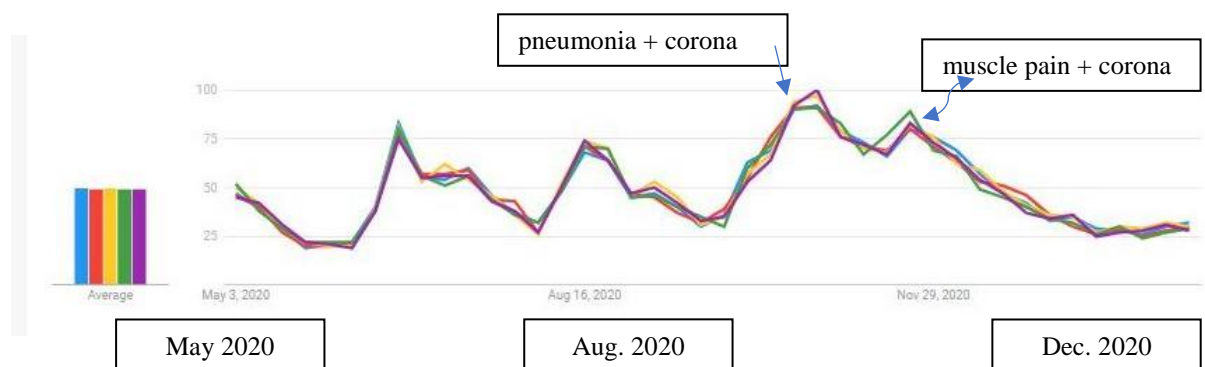
With the outbreak of pandemic in Croatia and lockdown in March 2020 Croatian citizens are beginning to google intensively for terms related to COVID-19. We checked the most COVID-19 related queries in Croatia and here we highlight the queries that showed the highest correlation with official indicators.

Figure 1. Queries Reported by GT Concerning Queries “PCR +COVID”, “PCR + Test” and “Coronavirus + Testing” from May 2020 to February 2021 in Croatia



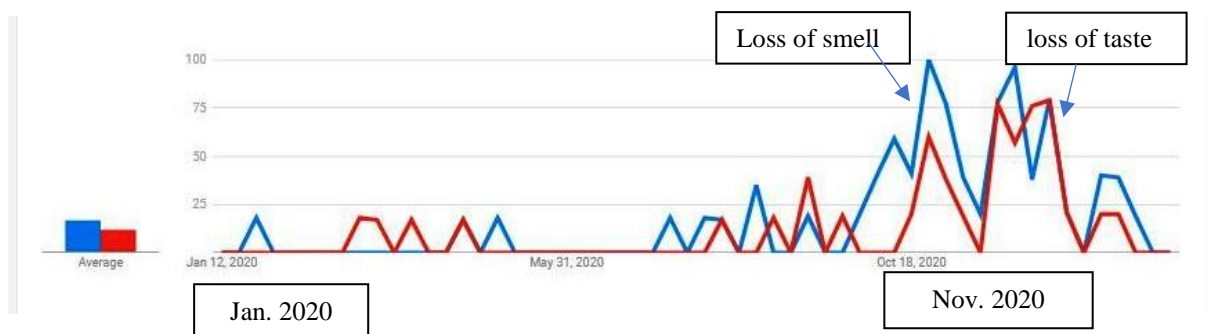
It is confirmed that the Increase in Google search queries “PCR +COVID”, “PCR + test” and “coronavirus + testing” is correlated with the increase in the number of new cases (Figure 1). The decrease in Google search is correlated with the decrease in the number of new cases (see below R^2).

Figure 2. Queries Reported by GT Concerning Symptoms “Cough + Corona”; “Pneumonia + Corona”; “Dry Cough + Corona”; “Runny Nose + Coronavirus”; “Muscle Pain + Corona” from May 2020 to February 2021 in Croatia



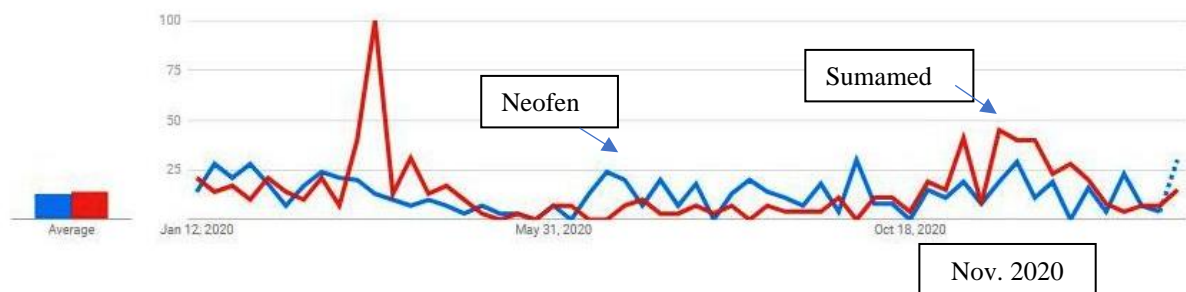
It is confirmed that the increase in Google search queries “cough + corona”; “pneumonia + corona”; “dry cough + corona”; “runny nose + coronavirus”; “muscle pain + corona” is correlated with the increase in the number of new cases (Figure 2). The decrease in Google search is correlated with the decrease in the number of new cases (see further proceedings in continuation).

Figure 3. *Queries Reported by GT Concerning “Loss of Smell” and “Loss of Taste” from January 2020 to February 2021 in Croatia*



It is also confirmed that the Increase in Google search queries “loss of smell” and “loss of taste” is correlated with the increase in the number of new cases. The decrease in Google search is correlated with the decrease in the number of new cases (Figure 3).

Figure 4. *Queries Reported by GT Concerning “Neofen” (Medication) and “Sumamed” (Cro. Most Popular Antibiotic) from January 2020 to February 2021 in Croatia*



We have also researched whether the use of recommended drugs increased - “Neofen” (medication for fever) and “Sumamed” (Cro. most popular antibiotic). It can be seen in Figure 4 that the demand for these drugs increased especially at the time of the pandemic outbreak and in the fall of 2020 when the largest number of new cases was recorded.

Google search interests can also be used to predict the number of COVID-19-related emergency department visits in the area. The regions in which these terms were searched recorded the largest increase in the number of new cases a week later.

Figure 5. Correlation by Regions

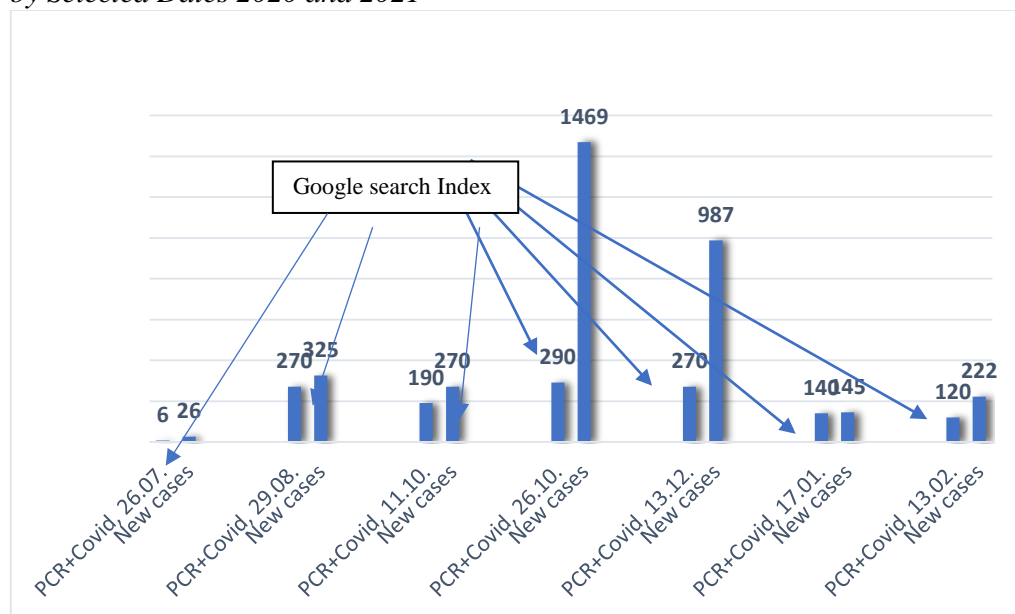
● neofen ● sumamed



The search for these drugs correlates with a sharp increase in the number of new cases in November 2020 in the northern Croatian regions (Figure 5)¹⁹.

In further proceedings to standardize the data, we requested the data for the period from January 2020 to 20 February 2021 and divided the keyword frequency for each word (see Table 1) giving us a search frequency index. Then we have compared searches with official statistics to prove the significations of results (see HZJZ.hr). We especially focused on the so-called second wave of infection spread when cases began to grow exponentially.

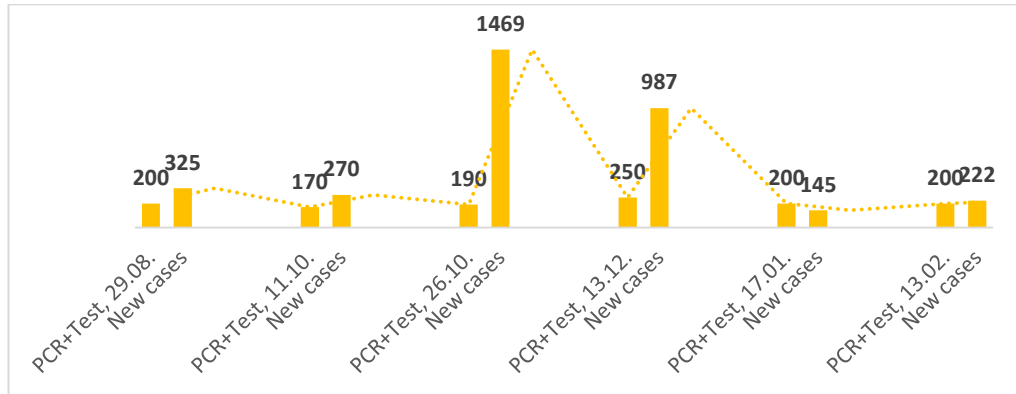
Figure 6. Correlation between Google Search Index for Query “PCR +COVID” and the Official Number of Reported New Cases of COVID-19 Patients in Croatia by Selected Dates 2020 and 2021



¹⁹Novi list.hr 2020.

The graph in Figure 6 shows that the increase in Google search is correlated with the increase in the number of new cases and that the decrease in Google search is correlated with the decrease in the number of new cases.

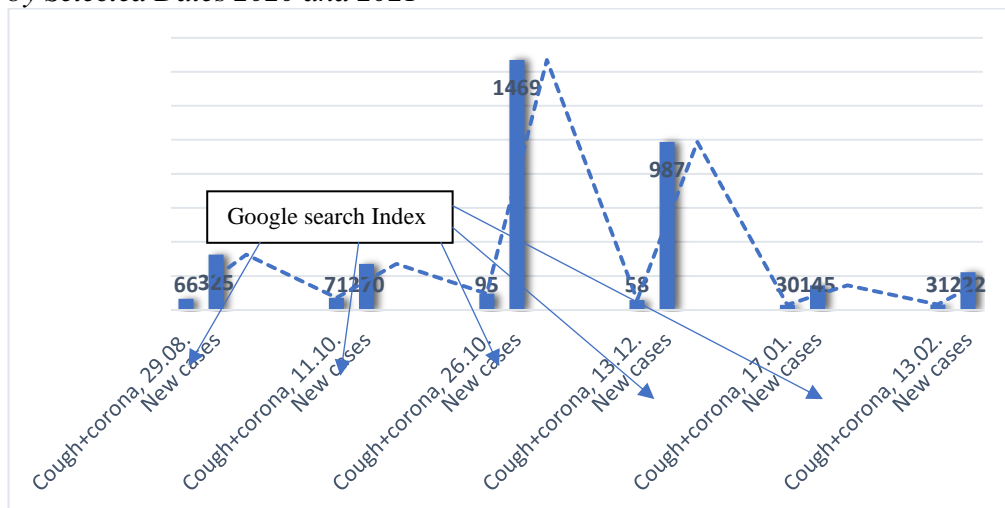
Figure 7. Correlation Between Google Search Index for Query “PCR +Test” and the Official Number of Reported New Cases of COVID-19 Patients in Croatia by Selected Dates 2020 and 2021



All search activities using Google for significant terms “PCR +COVID”, “PCR + test”, “coronavirus + test” correlate strongly with observed official cases²⁰ of the disease (Figure 7).

In the continuation of the work we tested the model for the most common symptoms of cough, pneumonia, and muscle pain and compared the data with official data²¹.

Figure 8. Correlation Between Google Search Index for Query “Cough + Coronavirus” and the Official Number of Reported New Cases of COVID-19 Patients in Croatia by Selected Dates 2020 and 2021



²⁰See HZJZ.hr.

²¹See HZJZ.hr.

Figure 9. Correlation Between Google Search Index for Query “Pneumonia + Corona” and the Official Number of Reported New Cases of COVID-19 Patients in Croatia by Selected Dates 2020 and 2021

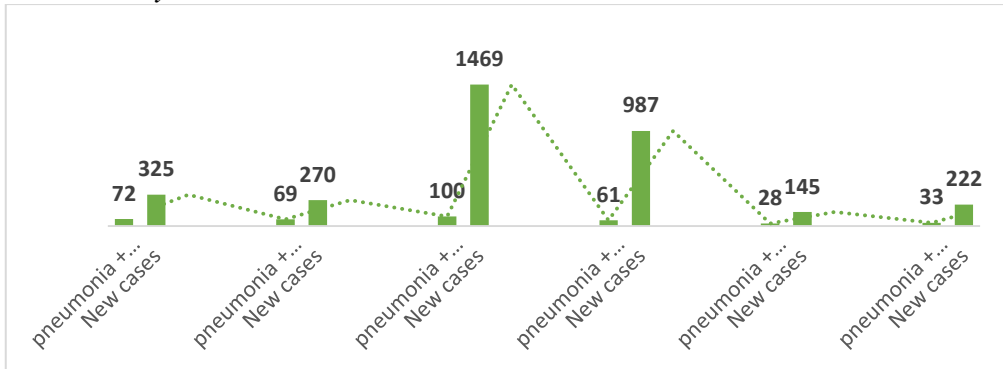
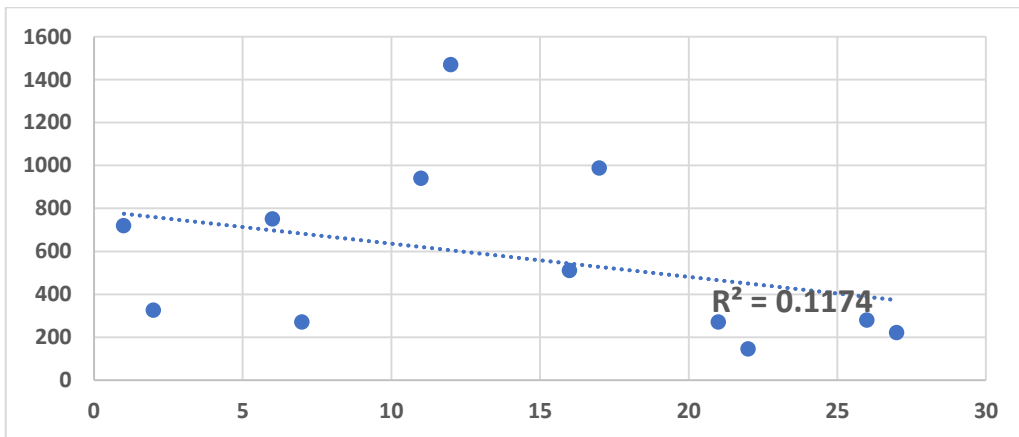
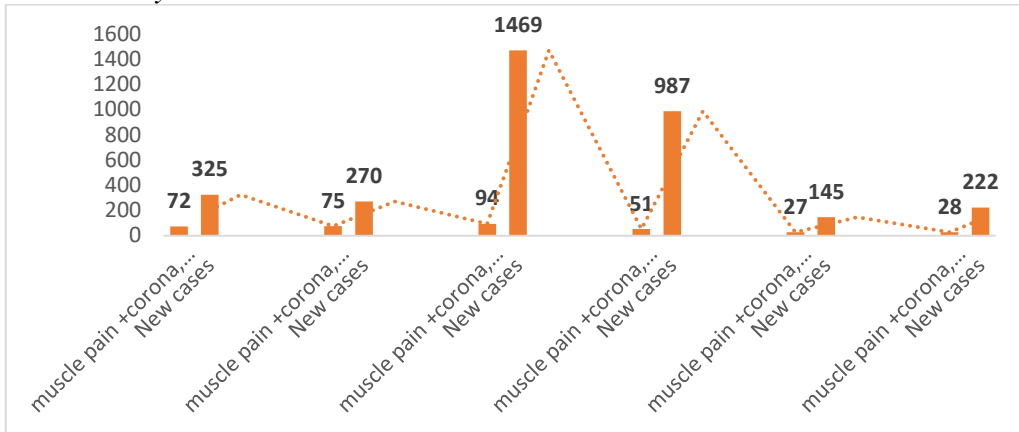


Figure 10. Correlation between Google Search Index for Query “Muscle Pain + Corona” and the Official Number of Reported New Cases of COVID-19 Patients in Croatia by Selected Dates 2020 and 2021



The search activities using Google for symptoms “cough + corona”, “pneumonia + corona”; “muscle pain + corona” correlate with official data of new cases.

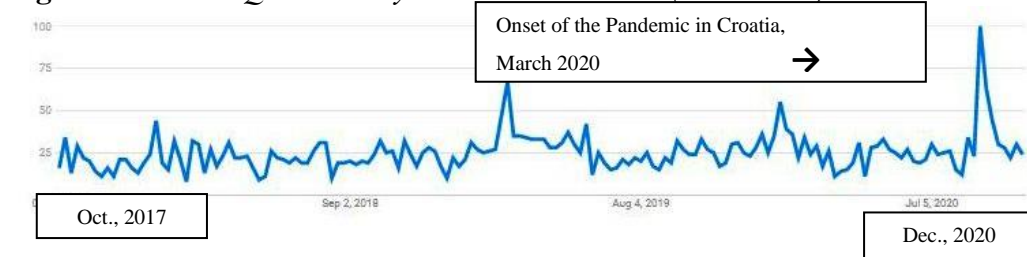
All graphs in Figures 8, 9 and 10 show that the increase in Google search is correlated with the increase in the number of new cases recorded by official statistics and that the decrease in Google search is correlated with the decrease in the number of new cases recorded by official statistics.

Screening for Mental Health Problems During the Pandemic with Google Trends

The method presented here can also identify clues that could affect mental health in some specific period.

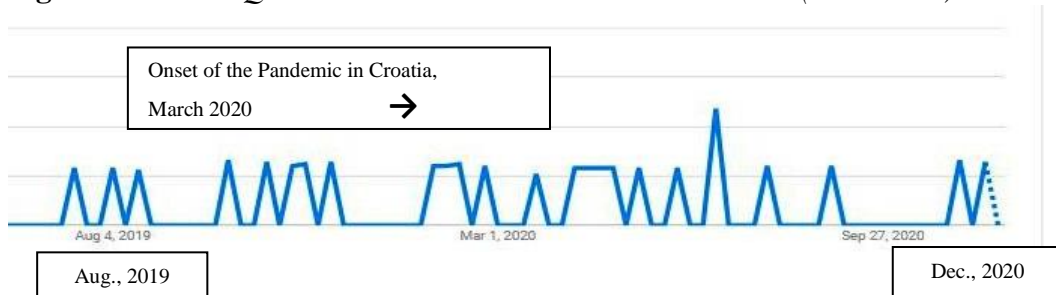
After disasters, most people are resilient and do not succumb to psychopathology. Nevertheless, the primary concern is post-traumatic stress disorder (PTSD) arising from exposure to trauma (see Friedman 2013). Medical conditions from natural causes, such as life-threatening viral infection and earthquakes, do not meet the current criteria for trauma required for a diagnosis of PTSD, but other psychopathology, such as depressive and anxiety disorders, may ensue (Pfefferbaum and North 2020). It is therefore not surprising that in Croatia search queries “psychiatrist” has increased (Figure 11).

Figure 11. Search Queries “Psychiatrist” in Croatia (2017-2020)



We also noticed an increase in searches for tranquilizers and sedatives like *Normabel* (the most popular in Croatia) (Figure 12).

Figure 12. Search Queries “Sedatives + Normabel” in Croatia (2019-2020)



Among the global population depression and anxiety disorders have worsened during the COVID-19 pandemic. Current methods for screening these two issues rely on in-person interviews, which can be expensive, time-consuming, and blocked by social stigma and quarantines (Zhang et al. 2020, p. 1). About two-thirds of the sample in a study by Jovic et al. (2020) in the USA reported using the Internet more during the pandemic, and more than 10% of participants spent over

8 h on the Internet daily (Jovic et al. 2020). In the case of Croatia, this depends on socio-economic factors (see introduction). Considering that traditional survey methods are time-consuming and expensive, we need timely and proactive data sources to respond to the rapidly evolving effects of health policy on the population’s mental health.

Zhang et al. (2020) show that behaviours on online platforms in the USA can be used to understand personal well-being. Our insights suggest that GT has also the potential to capture clinically alarming deteriorations in the depression and anxiety profiles of users in Croatia in a non-invasive manner. Most importantly, such ubiquitous online footprints may provide useful signals of deteriorating mental health profiles (e.g., depression and anxiety) of users during COVID-19. They may capture insights into what was going on in the mind of the user through a non-invasive manner (Zhang et al. 2020, p. 1; see Saeb et al. 2016, Ghandeharioun et al. 2017, Wang et al. 2018).

When we look at the results of the most common entries in Croatia before and after Lockdown (Table 2), we can see that common daily topics like matches and the like have completely shifted in the direction of health concerns and other concerns.

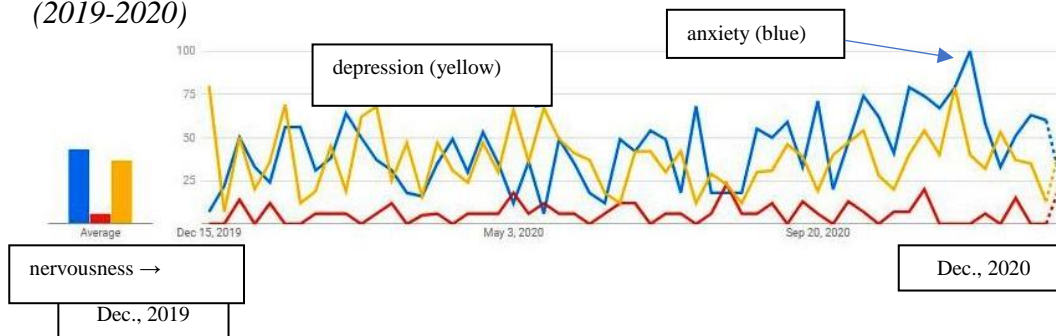
Table 2. *The Top Five Entries in Croatia Before and After the Lockdown (2019 and 2020)*

Before lockdown (2019)	After lockdown (2020)
1. Results of the EU elections #croatia	1. Coronavirus
2. Strike	2. Google Classroom; Zoom
3 Dinamo - Benfica	3. Office 365 for schools
4 Handball Championship 2019	4. Zagreb earthquake
5 Croatia - Slovakia	5. Kobe Bryant
6 Notre Dame	6. e - Pass
7. Prado Museum	7. US elections
8 Dinamo - Viktoria Plzen (match)	8. Croatia State Election Commission
9 Love is in the Village (series)	9. Joe Biden
10 Wimbledon	10. Masons

Source: Google Year in Search 2020: <https://trends.google.com/trends/yis/2020/HR/>.

With the use of analytic tools Google Trends, we have developed functions to quantify changes in online behaviour and online searched terms during the pandemic.

Figure 13. *Search Queries “Anxiety + Depression + Nervousness” in Croatia (2019-2020)*



We found that collocations containing the terms “anxiety” and “sadness” keywords under the “negative emotion” dimension showed a significant increase. In this part of the study, it was particularly surprising to us how much the entries related to the phrases “suicide” and “depression” have increased in Croatia (Figure 13).

The results from Zhang et al. (2020) suggested that deteriorating depression and anxiety conditions in the USA have strong correlations with behavioral changes in Google Search use during the COVID-19 pandemic. Though further studies are required, our results for Croatia demonstrate the feasibility of using big data to establish non-invasive surveillance systems for mental health conditions that bypass many disadvantages of existing screening methods.

Domestic Violence and COVID-19 Pandemic

Experts across the globe (USA, Italy, Germany, etc.) acknowledge the risk of an increase in family violence through and possibly beyond the COVID-19 pandemic (UN Women 2020). Preliminary estimates were that “for every 3 months the lockdown continues, an additional 15 million (...) cases of gender-based violence are expected” (UN Population Fund 2020, p. 2).

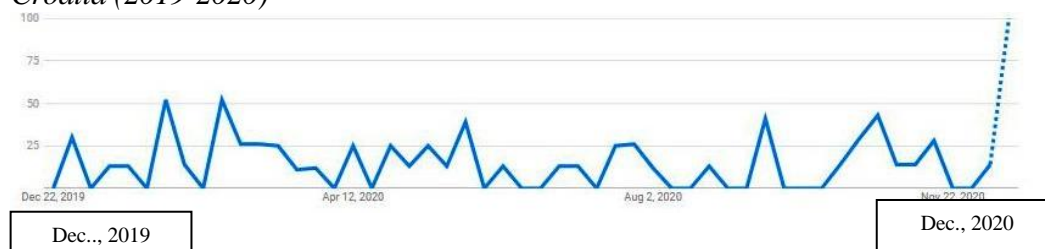
Economic insecurity and poverty-related stress appear to be the most common pathway linking pandemics and family violence. Economic stress may lead to psychological stress, poor mental health, and maladaptive coping strategies, including substance misuse and stealing money or food, which in turn are linked with an increased risk of family violence (Spiranovic et al. 2020). Social restrictions and lockdowns during the pandemic can have a detrimental impact on parents who might experience additional pressures in cases of school closures. Like the economic stress pathway, psychological stress is linked with increased family violence (Spiranovic et al. 2020). The increased violence has also grown through reductions in outside assistance and options to safely leave a violent relationship (Spiranovic et al. 2020). Restrictions and lockdowns may force women and children to remain within a violent home, and women may also be less willing or able to seek help during pandemics.

Much of this applies also to Croatia. During the first half of 2020, 37% more misdemeanours and as much as 57% more criminal offenses were recorded in Croatia than in the same period in 2019. The Ombudsman Office of the Gender Equality states that during the isolation due to the pandemic, it recorded an increased number of complaints of domestic and partner violence. Therefore, the Office asked the Government for additional protection of women because, statistically speaking, women were a more vulnerable group in terms of labour rights, salaries and pensions, and exposure to domestic and sexual violence during the epidemic²².

In this period, we see an increase in problems in Croatia related to alcoholism, since there is an evident search for the terms such as “alcoholism”, “violence and alcoholism”, “how to treat alcoholism” and the like (Figure 14).

²²Gender Equality Ombudsman Croatia 2020.

Figure 14. Search Term Related to the Phrase and Collocations “Alcoholism” in Croatia (2019-2020)



An interesting finding that we have noticed is a serious indication that the number of divorces in Croatia will in 2021 growing. Besides, in 2020, the fewest marriages were concluded in Croatia since the records were kept (DZS 2021).

Influences of COVID-19 Pandemic on Fertility Rate in Croatia – An Approach of Digital Demographic

Historically, as mentioned, economic crises have never been the preferred period for a couple to decide to have a baby. The results of Luppi et al. (2020) show that fertility plans have been negatively revised in all countries, but not in the same way. In Germany and France, fertility plans changed moderately, with many people still planning or postponing their decision to have a child during 2020. In Italy, instead, the proportion of abandoners is much higher than in other countries, while comparatively, it shows a lower proportion of those deciding to postpone their plans (Luppi et al. 2020). Results suggest that different mechanisms are at work, due to the different economic, demographic, and policy pre-crisis backgrounds and post-crisis prospects. Low-fertility contexts, in particular, appear to be more at risk of a fertility loss due to the crisis (Luppi et al. 2020).

In Europe, the climate of uncertainty caused by the COVID-19 pandemic might have been stressed by the still ongoing effect of the 2008 financial crisis, especially in Southern European countries where young people and women’s employment indicators and fertility rates are the lowest (Matysiak et al. 2020). Additionally, the physical distancing required by the COVID-19 containment strategy imposed also restrictions to (physical) intergenerational support and this might affect more strongly fertility plans in those countries, such as Italy and Spain, where grandparental childcare is more intensive, also due to lower availability of childcare services (Luppi et al. 2020). In countries where the previous economic and labour market situation was more positive (i.e., Germany and France) the proportion of those abandoning the fertility plans for 2020 is much lower than in the other countries; these countries, instead, show the highest proportion of people still planning a child for 2020. On the contrary, in Southern European countries, and more dramatically in Italy, people are more often abandoning – and not simply postponing – their pre-crisis fertility plans (Luppi et al. 2020).

In general, epidemics and disasters like earthquakes in Croatia (March and December 2020) manifest a common pattern as far as their impact on the population, i.e., a steep decline in birth rates followed by gradual increases and then followed by a baby boom (see Ullah et al. 2020). The USA experienced a

decline in birth rates during the great economic recession in 2008, and the trend was sustained till the first half of 2009, whereas the birth rates in 2007 were the highest recorded for the prior two decades (Ullah et al. 2020). A study carried out by Pew Research Center (2009) in the USA reported that 14% (aged 18-34) and 8% (aged 35-44) of those surveyed were still planning to postpone having a child due to the prior financial downturn (Ullah et al. 2020). Other factors such as the availability of contraception and women's educational attainment levels may also influence fertility rates (Ullah et al. 2020). Therefore, the economic recession caused by the COVID-19 pandemic may impose a long-term impact on the fertility rate, even after the pandemic has abated or been resolved (Ullah et al. 2020).

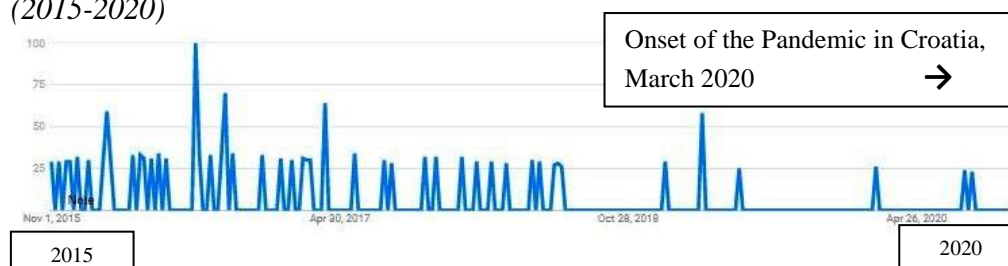
In this section, we examine the potential effect of the COVID-19 pandemic on future birth rates in Croatia. Keyword and topic selection criteria include search queries in Croatia during 2020: Pregnancy Intention: Ovulation Test, Pregnancy Test; Unplanned Pregnancy: Emergency Contraception, the "Morning-after" pill; Pregnancy Symptoms: Missed Period, Pregnancy Symptoms; Pregnancy Termination, Medical Abortion (see Jurić 2021a). The analytical tool Google Trends is also a useful source of data for determining, estimating, and predicting the fertility rate by the Croatian population. This method shows that monthly births in Croatia will drop sharply by approximately 13% in the year 2021 (Jurić 2021a). These assumptions are already confirmed by the CBS (DZS) for January 2021, where according to official data, a 10% drop in newborns can be seen (DZS 2021).

An important effect on the birth rate is played by the increase in abortions (there are no official data for now). With the GT tool, we noticed in Croatia that the demand for abortion pills increased especially at the time of the pandemic in Croatia. This trend decreased significantly as the number of COVID-19 patients fell in the summer of 2020. We also noticed an increase in searches for the term "abortus" in this period (Jurić 2021a).

In March 2020, there was a fall in demand for pregnancy and ovulation test kits in the USA (Dickson 2020), suggesting fewer people are trying to get pregnant. We also noticed this trend in Croatia based on our method.

Despite the survey in the USA, their sex lives, as well as planning for parenthood, have been substantially influenced during the COVID-19 pandemic (Micelli et al. 2020) by many reasons like worries about future economic difficulties, fear of getting infected, complications during pregnancy, shortage of healthcare workers, and disease clusters in hospitals (Ullah et al. 2020). Studies in the USA have shown that such high fatality disasters lead to a decline in births in the several months that follow such events. After several months (8-12 months) of the epidemics, a reduction in birth rates was apparent and was followed by a noticeable upward trend in the birth rates that lasted well into 20 months after the beginning of each of these epidemics (Ullah et al. 2020).

Figure 15. Search Terms Related to the Entry “Pregnancy by Weeks” in Croatia (2015-2020)



Source: Jurić 2021a

Monitoring the search for keywords related to the concepts of pregnancy by week (Figure 15) proved to be a good approach in estimating the decline in birth rates in Croatia, because the first official data for January 2021 confirmed our assumption (DZS 2021, Jurić 2021a).

All these insights show that GT has the potential to capture attitudes in the bride spectrum of family life themes. These insights can be very useful to understand and predict some behaviours in the field of public health and for monitoring families but also for predicting new COVID-19 cases in a specific area.

Conclusion

Our study reduces the gap in human behavioural data, by providing timely and accurate data on individual behaviours, attitudes and monitoring families in Croatia. The paper illustrates how Google Trends together with the official data can offer an innovative and powerful tool for rapid and continuous data collection to monitor trends in behaviours relevant for mitigation strategies of COVID-19.

The basic methodological concept of our approach is to monitor the digital trace of language searches with the Google Trends analytical tool (trends.google.com). We divided the keyword frequency for selected words giving us a search frequency index and then compared searches with official statistics to prove the significations of results. The method tested in this paper confirmed that the increase in Google search is in positive correlation with the increase in the number of new COVID-19 cases and that the decrease in Google search is correlated with the decrease in the number of new cases. Researchers could use this method to provide an earlier and more accurate indication of the re-emergence of the virus in specific parts of the country. If a region experiences an early, sharp increase in COVID-19-like-illness physician visits, it may be possible to focus additional resources on that region to identify the etiology of the outbreak, providing extra vaccine capacity or raising local media awareness as necessary. This is relevant for family life because it has been observed that the virus spreads particularly rapidly in households where more young and old people live together. In countries like Croatia which are characterized by a higher share of intergenerational co-residence and contacts among generations, this fact became a risk factor during epidemics. With the early detection of the spread of the virus in certain parts of the country,

measures such as closing cafes, clubs, and switching to online classes, etc. can be introduced quickly to take preventive action.

The presented method contributes also in a way that proves the feasibility of measuring certain attitudes and behaviours in family life's during pandemics such as an increase in stress, anxiety, and domestic violence and can give reliable projection-related estimates regarding birth rates in the future. During the isolation due to the pandemic, in Croatia, we recorded an increased number of indices of domestic and partner violence. With Google Trends, we found that collocations containing the terms “anxiety” and “sadness” keywords under the “negative emotion” dimension showed a significant positive correlation. We see also an increase in problems in Croatia related to alcoholism.

Historically, crises have never been the preferred period for a couple to decide to have a baby. An important effect on the birth rate is played by the increase in abortions. With the GT tool, we noticed in Croatia that the search for keywords related to the concepts of pregnancy by week proved to be a good approach in estimating the decline in birth rates in Croatia, because the first official data for January 2021 confirmed our assumption.

According to our method, in Croatia, the birth rate in 2021 will be just 87% of what it would be “a normal year”. Monitoring the search for keywords related to the concepts of pregnancy by week proved to be a good approach in estimating the decline in birth rates in Croatia, because the first official data for January 2021 confirmed our assumption (DZS 2021).

Unquestionably, there are significant open methodological issues and the questionable integrity of the data obtained using this source. The fact is also a problem that GT does not provide data on which population was sampled or how it was structured. Although these open-ended issues pose serious challenges for making clear estimates, statistics offer a range of tools available to deal with imperfect data as well as to develop controls that take data quality into account. Many of these limitations can be overcome also by triangulation.

All these insights show that GT has the potential to capture attitudes in the wide spectrum of family life themes. These insights can be very useful to understand and predict some behaviours in the field of public health and for monitoring families but also for predicting new COVID-19 cases in a specific area, which makes it possible to take preventive actions promptly.

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COVID-19: Cartography as a Witness of Change of Spanish Urban Models Along History Due to Sanitary Crisis

Bárbara Polo Martín

During past centuries, pandemics were something very natural to the human race, but as result of industrialisation during the 19th century, they became a larger problem. The arrival of populations to big cities provoked the development of irregular and overpopulated quarters without any measures of safety, and facilitated the expansion of diseases. The problem resided in sanitation problems, as the example of what happened in London and Paris. As a solution, in different cities, and as a starting point, Paris with the Haussman's proposals, issued different reforms and extension plans were made in Spain (Nadal 2017, 357-385). Humanity believed that these extension plans would give us a healthy density and an ordered expansion. We opened big boulevards to believe that we had a wide city to walk, but nothing could be further from reality. At the beginning of 20th century, history repeated itself, and now, a new pandemic crisis has shown that cities have, again, a crisis of congestion.

Keywords: *cartography, cities, COVID-19, urban models*

Introduction

As a result of a health crisis, speculations on the conditions and perspectives of urban historical centres within the aftermath of the worldwide COVID-19 pandemic, supported different European cases. Right now, European cities are being hit by the ‘second wave’ of the worldwide epidemic, and are subjected to different containment strategies and measures. During last year, a range of plans have strongly impacted the economy, based, overall, on tourism in the city centres, leisure, and cultural consumption. The COVID-19 situation has had major consequences in terms of unemployment and economic depression. More extensively, the very life in city centres was highly affected, in terms of residency, mobility and access to public spaces. The previous, current and potential future use of green areas exposes a scope to rethink the paths of the economy and more-than-economic possible uses of city centres, especially when it involves new ways of connecting economy, lifestyle and citizen-led innovation.

In the unfolding of the pandemic, then, political rhetoric came to the front, building on the thought of learning from the pandemic and prospecting a replacement “urban renaissance.” However, the extent to which such discourses can challenge and review pre-existing urban regimes is clearly questionable—they seem to romanticize new urban scenarios and agendas. In such a context, and within the framework of the upcoming renewal of the Leipzig Charter published in the end of 2020, it is of particular interest to critically reflect on the areas, domains and potentials of the transformation of the historic centres of European cities post-pandemic. In the last two centuries we can observe in cartography a pattern that is

repeated in cities: the change of their structure due to external agents. We can speak of cities of extension during the nineteenth century, to cities of pandemics, in plural.

The latest crisis, COVID-19, has allowed for pedestrianizing centres, to create cycle lanes, to increase the use of public transport, and all this, using few resources. Governments have used unique situations like that in which the city is transforming to achieve sustainable development; in places such as New York's bay after the floods (New York City Regional Heat Island Initiative 2006, United States Environmental Protection Agency 2008), New Orleans after the hurricane, Paris with population increase, or Barcelona with COVID-19.

Crises make tangible changes. They invite governments and citizens to dream, a crisis to evolve, but the citizenship has to be the main defender of these new changes, not government, as in previous occasions. The question that arises in first place is whether the temporary experiment becomes permanent in the centre. To that, we should ask, who is really in charge of this change, the governments or the citizens? Finally, we should ask ourselves as researchers if the COVID-19 crisis has acted as a real trigger for the change of urban configuration, or was it something that has been previously agreed.

Literature Review

“Public health problems were the ones that made the city to be rethought because diseases afflicted both, the rich and the poor,” Richard Sennet wrote in *Build and Inhabit*. During past centuries, pandemics were something natural to societies, but as a result of the industrialization during the 19th century, they became a drag (Smith 1979). The arrival of large populations to big cities provoked the creation of irregular and overpopulated quarters without any measures of safety, and facilitated the expansion of diseases. As a consequence, the matter resided within the sanitation's problems. This situation happened, firstly, in London and Paris (Hamlin 1991, Geneviève 2007, Halliday 2013). As a solution, in several cities, and as starter point in Paris with the Haussman's proposals (Figure 1), different inner reforms and extension plans (Nadal 2017, pp. 357–385) were made. Humanity believed that these extension plans would give cities a healthy density and an ordered expansion. Governments opened with scalpel big boulevards to make us believe that we had a good city to walk.

The current urban configuration in many countries is predicated on their many attempts to address health problems during the 19th century (Rodger 1996). At that point, the link between the growth of cities, and therefore the spread of disease, led some countries to adopt a replacement perspective on health risks (Hamlin 1992). For example, within the last third of the 19th century, England became the leader in terms of sanitation. Starting at that point, the mechanisms available to fight classic epidemics were reassessed, new preventive measures against transmissible diseases were adopted, a shift in focus from the environment to the people happened (Rodríguez Ocaña 1994), and different by-laws concerning health were passed in many cities. Those by-laws affected areas such as drains and sewers, street lighting,

the regulation of accommodation, slaughter house activity and markets. However, these healthcare worries were taken into account early in most parts of European countries (Wohl 1983), including Spain. By the end of the 19th century, Spain was clearly a backward nation in economic, political and social terms (Capel and Tatjer, 1991). This resulted in a proposal to adopt measures and develop infrastructures already adopted in other European countries (Arnould 1902, Sussman 1997, Poligliano 1984, Hildreth 1987).

Figure 1. *Haussman's Plan for Paris*



Source: arqui-urba.blogspot.com.

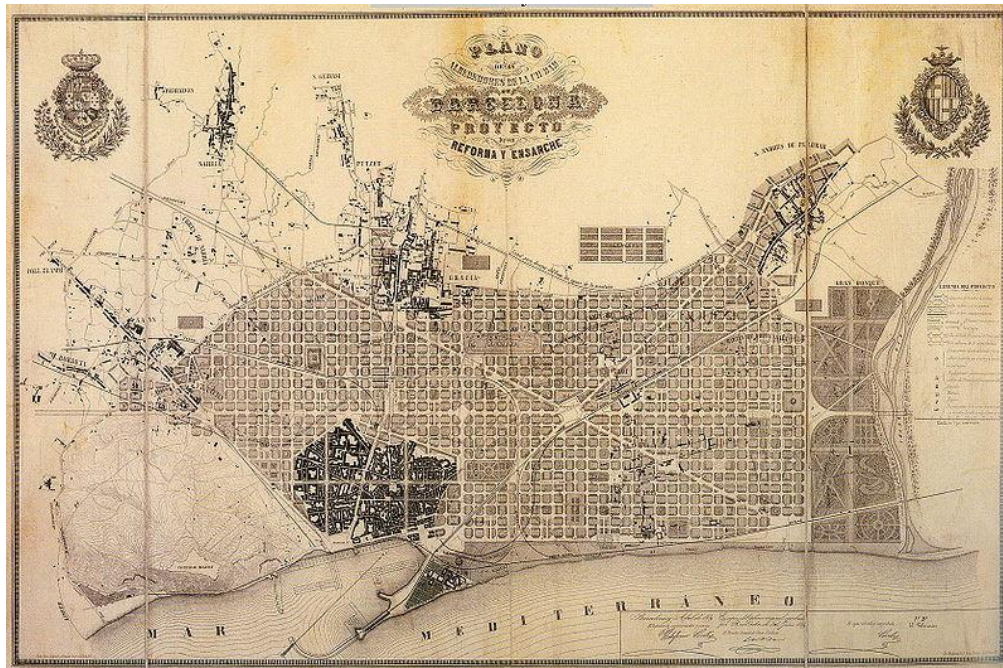
The recommended improvements were related to sanitation because of the poor state of health of the Spanish urban population (Real Consejo de Sanidad 1901, Coronas Vida 2008). The conditions in Madrid, for instance, were completely deficient, despite the extensive structure that had been administered since 1856. There have been over 3,000 cesspits within the city, while in outlying neighbourhoods and parts of the old city, the sewers had no traps to stop the discharge of noxious fumes and nearly 4,000 homes had no direct water supply (Hauser 1913).

Meanwhile, Barcelona City Council undertook a sanitation project between 1885 and 1893. As a part of the project, the authors suggested building tanks from which water was released in order to maintain the circulation within the sewer and drain system. It was necessary because of insufficient connections to dwellings in Spain (Capel and Tatjer 1991). In 1901, a conflict broke out in Seville between the League of Householders, and therefore the council halted the construction of the latest drains within the old city (Pulido Fernández 1902). Specifically, of the seven Spanish cities with more than 100,000 inhabitants, only Zaragoza and Seville had

extensive modern systems of drains, although the water system was deficient. In other cities such as Madrid, Valencia and Malaga, the land put aside water that was unusable due to the poor state of the drains. The same circumstances happened in Barcelona and Murcia. The high death rate due to infections was seen as evidence of the importance of hygiene, and the relatively large sanitation gap in Spain regarding urban organization (Hauser 1913, Pulido Fernández 1902): urgent action was required.

The sanitary enhancements were accompanied by the changes in the structure of the cities. Related to the organization problem since the middle of the century, the Spanish government approved a range of acts with the aim of regulating urban growth. As in other countries, inner reforms and extensions were the solution. Thus, in 1864, the first Population Expansion Act was approved, although it was not applied until three years later. Its preparation was preceded by the Barcelona Expansion Plan (Figure 2). This plan was designed by Ildefons Cerdà, approved by the Central Government in 1859, and by the Minister José Posada Herrera, author of a failed project of the Reform, Sanitation and Expansion Act. All these legal and regulatory measures were inspired by the large urban planning operations carried out in Paris by Haussmann between 1851 and 1869, and in Vienna from 1857, with the Ringstrasse (Martín Ramos 1993, p. 7).

Figure 2. *Map of the Surroundings of the City and Project for its Improvement and Extension*



Source: Museu d'Historia de la Ciutat, Barcelona.

After the first Population Expansion Act, two others were published in 1876 and 1892 respectively. This last one was created specifically for Madrid and Barcelona (Martín Ramos 1993, p. 11). However, the extension model seemed to not be the only solution to enhance the situation, and, in 1895, the Extension Act was

accompanied by an Internal Reform Act, which pretended to follow the Haussmann example: the opening of streets in the urban centre and downtown renovation.

In both models, Barcelona and Madrid, a series of avenues or diagonals were devised to allow rapid movement with a geometric urbanism. These neighborhoods were designed for the new capitalist bourgeoisie that saw the historic centre as not a very pleasant place to live because of its narrow streets, few amenities, little representative houses, although they still connected with it. The Cerdá's plan envisaged two large diagonals that would intersect, although the second would never be achieved. In Madrid, the diagonal that was planned would have to serve to cross the entire historic centre and connect the area of the Barrio de Salamanca with that of Argüelles-Moncloa. It was the famous Gran Vía in Madrid, where emblematic buildings such as Telefónica's quickly began to appear.

With the publication of regulatory measures at the beginning of the 20th century, some Spanish cities followed these two examples to have their own expansion projects; as was the case of Gijón (Suárez Muñiz 2018) or San Sebastián (Fernández Cuesta 2012), but these examples have remained hidden until now. This situation changed after 1924, when José Calvo Sotelo, then Director General of Administration of the political regime, implemented by General Miguel Primo de Rivera, approved the Municipal Statute and Regulations for Works, Goods and Services. Because of its approval, the municipalities with more than 10,000 inhabitants, and with a growth rate of more than 20% between 1910 and 1920, had to draw up an Extension Plan within four years. This act also led to a synthesis of the acts made relative to this issue since the end of the 19th century (Terán Troyano 1978, p. 169).

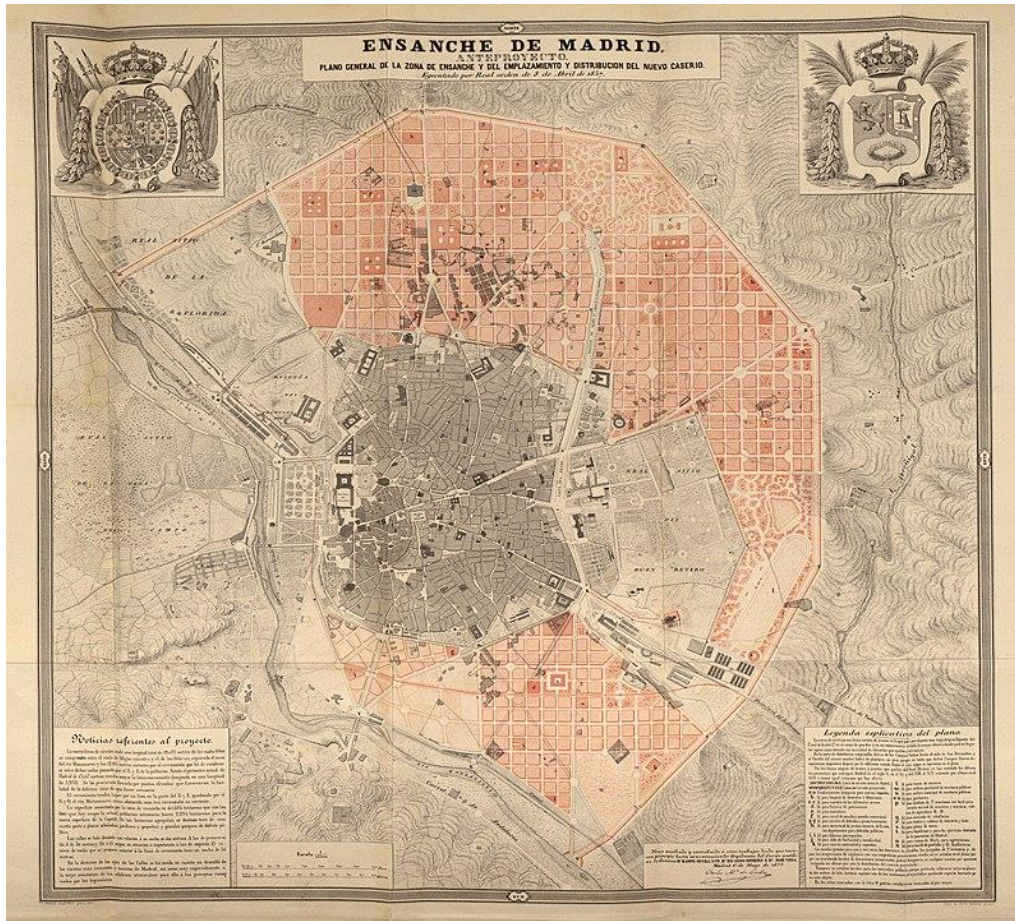
The promulgation of this provision served several purposes: Firstly, it worked as an instrument for the internal reform of the cities. Also, it allowed managing the expansion of the city to the historic centre. Thirdly, it served to plan the land's uses between the expansion and the limit of the traditional nucleus. These facts would allow the city and developers to quantify and regulate what was done in terms of expropriations, management projects, licenses, etc. (Davila Linares 1991, p. 102) According to Bassols Coma, these three perspectives formed the first complete plan on city planning in Spain (Bassols Coma 1973, 1996, pp. 53–90).

This Act, which was promulgated relatively late, supposed the explosion of urban trends that had been carried out in the rest of Europe since the beginning of the century, characterized by rationalism and forged in international architecture conferences. The culmination of these new urban designs was the Charter of Athens, promulgated by Le Corbusier in 1933, and which contained the elementary bases to understand the reality of the contemporary city (Aymoino 1978, Hilpert 1983, Segre 1985, Le Corbusier 1959, 1996).

With the law in one hand, medium-sized cities took as models Madrid and Barcelona, but overall this last one due to its organization. The expansion of Madrid tripled the city that existed previously. The one from Barcelona multiplied it by nine or ten. In the case of Madrid, there is a clear delimitation of the limit of urban action (Figure 3). In Barcelona, it is much less defined. The one in Madrid is more of the past: it has many baroque things, like streets that do not follow the centre's streets. The one from Barcelona, on the other hand, is a much more

rationalist and innovative product. Cerdà is the first to incorporate science into urban planning; for this reason it was taken as the model of Spain. Most parts of Spanish cities chose this solution, that is, the extension of the city, in which corresponds to the urban option known as expansion urbanism.

Figure 3. Map of the Extension Project (in red) and the Madrid's Ville (in grey), 1860



Source: Spanish Digital Library.

Nevertheless, in comparison with 19th century, Spanish City Councils have acted very quickly in order to enhance the welfare of their citizens; green and without-cars cities, cities for citizens and not only for the economy. Governments have known how to recover the previous state of the city and to promote spaces of quality. It is proposed that within 10 to 20 years cities are clean, green and car-free. The latest crisis, COVID-19, has allowed to pedestrianize centres, to create cycle lanes, to increase the use of public transport, and all this, only using few resources. Governments have used unique situations like that to achieve sustainable development—in cities such as New York after the floods of Sandy, New Orleans after the hurricane, Paris with population's increase, or Barcelona, Madrid or smaller Spanish cities with the COVID-19. The question that arises is whether the temporary experiment becomes permanent in the centre. Crises make tangible

changes, and they invite governments and citizens to dream and evolve. The citizens have to be the main defender of these new changes, and not governments as on previous occasions.

Since COVID-19 appeared, people have begun to discuss the architecture and urban planning of the confinement. Professionals say that confinement will mean a before and after. Some experts agree that perhaps the time has come to modify the way houses are built and designed, and to also think about their interior layout. We have to find solutions so that, within them, we can also be abroad. The key is the transformation of urban structures, which is to modify and whose changes can be seen through cartography. Digital maps, in the case of Spanish cities, provide a complete view of these changes developed during this pandemic: the cease of tourism houses, development of green and pedestrian areas, enlargement of cycle lanes or exclusion of cars. It is the old view of the city, or the so-called “urban corruption” against the new one. Even among these changes, the perception about rural life, reviled by many in the face of the maelstrom of the big city, is more attractive these days.

Methodology

Urban planners, builders and geographers look at the same information or problem with different perspectives. Each one analyses and joins new information in their urban studies about a problem. Taking into account the relevancy of maps to develop a new urban plan, some of them have been collected and used in this study. Also, in order to achieve the planned goals, it is proposed a thematic analysis through selection and comparison. With these sources of data, the corresponding analytic treatment was administered to get the correlations that would connect variables that ratify, or not, the working hypotheses.

The ongoing research examines the cities in different time periods and poses questions related to changes over time to these places, then put them together to provide multiple viewpoints. Time periods for urban development include 19th and 20th centuries and current conditions; these correspond to periods of growth in cities and mark times when maps or atlases are available. The application of knowledge organization and new visualization techniques provide a method for analyzing the transformations of an urban development before, during and after COVID-19 pandemics and for posing questions about the urban changes due to a new sanitary crisis.

Discussion and Results

European cities are experiencing a ‘second wave’ of urban transformations due to another health crisis, COVID-19. This crisis which started in the end of 2019, subjected cities to different containment strategies and measures. Last year, such measures have strongly impacted the economic base of the historic centres of cities such as Paris, New York and Barcelona. Most of them in-part are truly

associated with external agents like tourism, leisure, and cultural consumption.¹ More extensively, the very life of and in city centres was highly affected, from the point of view of residency, mobility, access to public spaces, and so on. Being enclosed in a house forces us to think about how we want the places where we live to be, and who we want to be with. Governments must find solutions so that, within them, society can also be abroad.

Searching for the answers to these questions previously exposed, create a range of different proposals in big cities in Spain, such as Barcelona or Madrid. These cities were taken into account as city models for the rest of cities in Spain before, and overall during, the pandemic. The urban proposals made by the different consistories have created an atmosphere considered environmentally-friendly, greener and sustainable, a model which differs highly from the configuration that every Spanish city has in origin.

According to the Barcelona Green Infrastructure and Biodiversity Plan created at the end of the year 2020 as a continuation of EU Biodiversity Strategy to 2020 and the strategies laid out along these lines by the UN by means of the Aichi targets for 2011-2020, some of the purposes of the city's government before the pandemic were addressed to preserve and improve the natural heritage present within the city to enable each and every one among us to profit from and enjoy. To become successful, the city hall has promoted, and currently does, different lines of action.²

At this point, the city's government considered this plan a vital point to strive towards a city where nature and urbanity converge and enhance each other, where green infrastructure attains connectivity and where green areas promote continuity within the natural area surrounding it. The aim is not for nature within the city to make a map of isolated spots; rather than seeking to forge a genuine network of green spaces. This greenery has been conceived as a green infrastructure forming part of the city, serving an environmental and social function. Thanks to the period of pandemic, the success is almost assured. Sustainability continues to be the main goal through its Agenda 21.

Consequently, this plan is another component of the general endeavours that the city is making in altogether areas. It includes air quality as well as protection of specific zones like Collserola Park, the biggest green area of the city. Barcelona City Council, and therefore the metropolitan area, implemented specific policies to enable nature to suit into the town and to reinforce biological diversity supported by the philosophy that a city with greater green infrastructure may be a city where people can benefit from higher levels of health and wellbeing (Figure 4). The city currently has the greatest number of cars per square kilometre in Europe, where pollution causes 3,500 premature deaths a year, and suffers a problem of urban heat island effect. Thanks to the crisis of COVID-19, governments have realized

¹https://ajuntament.barcelona.cat/turisme/sites/default/files/barcelona_tourism_for_2020.pdf
<https://meet.barcelona.cat/en/discover-barcelona/barcelona-today/responsible-and-sustainable-tourism>

²<https://ajuntament.barcelona.cat/ecologiaurbana/sites/default/files/Barcelona%20green%20infraestructure%20and%20biodiversity%20plan%202020.pdf> <https://ajuntament.barcelona.cat/superilles/es/>
<https://www.barcelona.cat/urbanismetactic/ca>.

the problem that citizens are going through and are facing the problem regarding some solutions proposed in other cities (Solecki et al. 2005).

The pandemic has made parks even more vital. People who live close to green spaces enjoy better mental health and reduce the risk of death from COVID-19. For this reason, the Barcelona City Council changed its plan, and the current plan is now to turn one in three streets in into parks known as Pocket Parks--because of its size inside the islands (Buckle 2014)--and create 21 new public squares in order to prevent the current problem that cartography reflects: isolated spots with no continuity. Also, the Consistory is trying to promote private greenery and to open private gardens to general public in order to improve health problems.

Figure 4. *Green Areas in Barcelona*



Source: Barcelona Green Infrastructure and Biodiversity Plan. City Council of Barcelona.

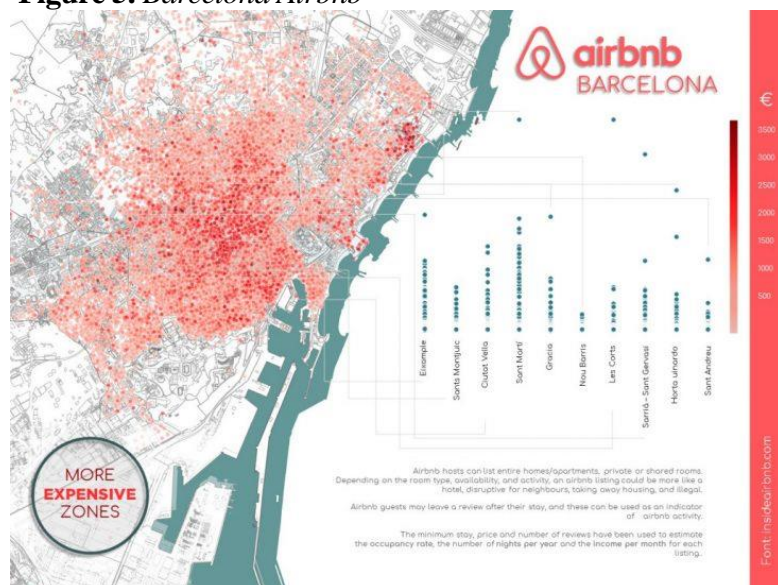
Other points taken into account during the pandemic was the economy, fully represented by tourism and, particularly, by the illegal housing. The problems regarding tourism and elevated prices started after 1990. Until that moment, the city was considered a “regular” city in Spain. However, the Olympic Games boosted the change of urbanism. The multiplication of hotels and the appropriation of part of the sea to build docks and a port made the city one of the most popular in Spain, and even Europe, to visit. For example, Barcelona has the largest port in the Mediterranean, which makes it a prime location for huge cruise ships. In 1990, around 115,000 cruise passengers came to the city. Before COVID-19, there were millions of tourists. The local government had to face mass tourism, which prevented the city to accomplish sustainable purposes.

The City Council took advantage of the COVID-19 situation to stop this, which provoked another problem: the increase in the pricing for regular citizens. Only three years before the pandemic, Airbnb provided a total of 18,817 available

rooms in the city and its surroundings. Among all places, the most expensive places to rent were in the centre of the city, where there was also the largest number of tourist places (Figure 5). From that point, a range of measures were proposed in order to avoid illegal practices and normalize the prices. The City Council proposed a city for citizens and not for tourists. The plan consisted of having more inspectors, and the creation of a new municipal body of observers to detect tourists operating under the radar (Ajuntament de Barcelona 2020).

Barcelona put together both plans: the social one and the sustainable one. Following the proposed plan to become a green city, it implemented, during COVID-19, a tourism's normative relative with respect towards environment. The City Council finally got the Biosphere certification for promoting tourism that shares an environmental responsibility between visitors and residents. To have a Biosphere accreditation as a sustainable tourist destination made Barcelona rethink its urbanism.

Figure 5. Barcelona Airbnb



Source: IAAC.

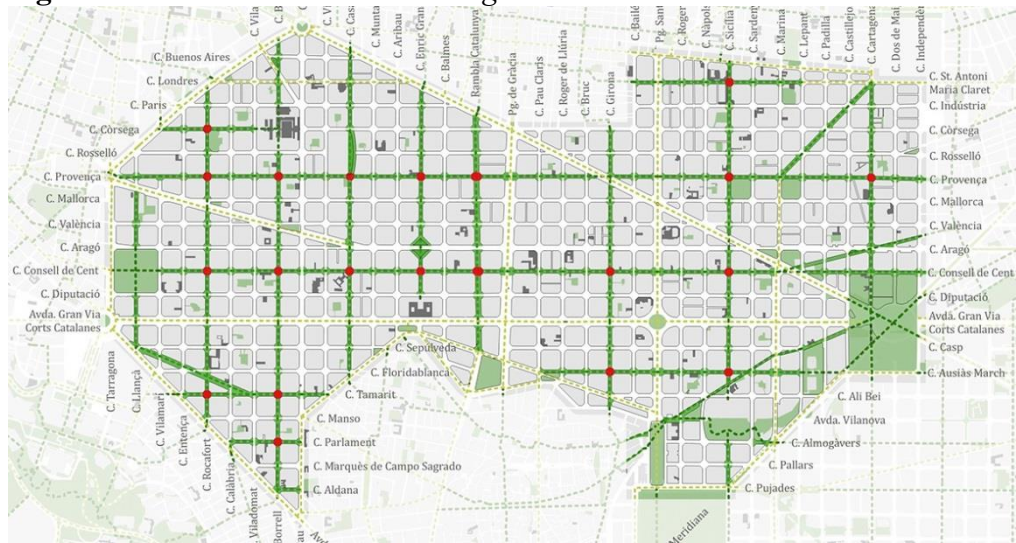
For that reason, during the pandemic, the changes implemented in Barcelona focused on a reform of the city centre's streets. The City Council's methodology was tactical urbanism (Hartley et al. 2014, Lydon and Garcia 2015). The necessity to gain space for the community during the confinement, with the aim of enabling new walking areas to keep safety distance—because of the number of citizens it was necessary to use roads as sidewalks to avoid inner contact— led to performance through tactical urbanism. These actions were soon structured within the framework of the Super Island Barcelona Project. In other words, a plan with four crossings in pedestrian squares, and four streets in green axes, resulted in almost a total pedestrianization of the city centre. Following the example of New York—which transformed Times Square in a walking area—and San Francisco with their parklets, Barcelona launched its proposal during the pandemic. The interventions, according to the tactical urbanism's idea, were low-cost, with low-impact, designed

and executed on a small scale and, with the logic of experimentation, it is possible to ascertain and evaluate their acceptance and leads to a comparatively short time, having the ability to react if necessary by modifying the action accordingly. In this sense, Tactical Urbanism is predicated on the exercise of participatory planning, where the community has to appropriate the proposals in order that they are just materialized.³

The first attempts with this new methodology were made in areas not very far from the centre, and that allowed to assess if the changes would serve correctly for the purpose. The selected areas were Poblenou, Horta and Sant Antoni. After the success in these areas, the city government decided to advance the project and modify the scale and the rhythm. In order to know the possibilities of the centre, the Barcelona City Council has carried out a careful analysis of flows and mobility of citizens, neighbourhood facilities, green spaces, constructive and social fabric. A road hierarchy plan has been carried out in order to free some streets from road traffic and to create a network of green axes and squares where pedestrians have priority. One of the examples of the modifications in the city centre that could be taken into account is Carrer de Pelai—one of the main streets of the city centre. There, 1,500 square metres have been given to pedestrians and native shops and businesses. Traffic also has been reduced. The project answers to the stress of local residents and commerce and can help provide an economic boost for the centre. Tactical projects in Barcelona have transformed life through the so-called “superblocks” in Sant Antoni and Poblenou, and have increased safety in areas around schools and have provided wider pavements in Ronda de la Universitat and Via Laietana (Figure 6). Because of tactical urbanism, we have been ready to answer the challenges of the pandemic by gaining pedestrian space, creating new terraces for bars and restaurants and increasing existing ones. Despite the changes that have been made in the city centre or by “example,” the City Council has planned to improve these measures in the rest of the neighbourhoods, like Sant Gervasi, Sants-Monjuic, Nous Barris.... This network allows the creation of a new map of the city in which citizens are the protagonists.

³https://dimad.org/di_alogos-sobre-diseno-y-urbanismo-tactico/

Figure 6. Green Slots and Street Changes in Cerdà's Plan



Source: Barcelona Green Infrastructure and Biodiversity Plan. City Council of Barcelona.

Nor should it be excluded that, despite being convenient actions for a sector, there's a gaggle of residents who, for various reasons, oppose the project. During this game of the affected population versus the consulted one, lies the demagoguery of power, or that of the loyalty to executive entity, within the organization of the participatory process.

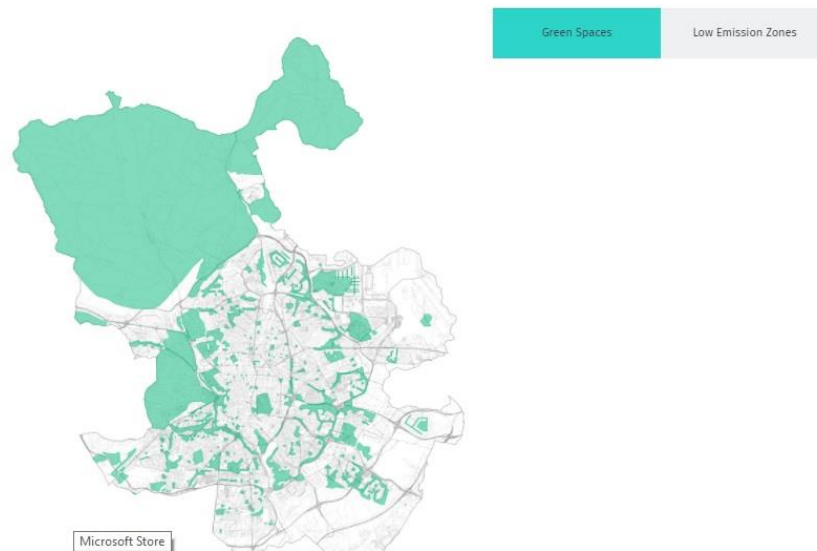
In this sense, the newest interventions administered in the streets of the municipality of Barcelona, despite the looks of how of approaching the transformation following the logic of this urban practice, guided by temporary participation, rather seem to be simple obstacles to the movement of vehicles. And, during this case, the validity of the answer should be assessed, not as an intervention of Tactical Urbanism within the public space, but as a measure to avoid pollution; and, if this is the case, it should be assessed whether the traffic jam caused by poor traffic flow can cause even more pollution. This has long outraged drivers whom are polite enough to not increase pollution, this point acoustic, by honking their horns. One of the hotspots of pedestrianization is the disappearance of places for parking.

As Barcelona and Madrid, capital of Spain, has also experienced similar problems before and during the pandemic, the changes proposed have not been as relevant as the Catalan City. Madrid has a long tradition regarding greenery. To choose Madrid as capital of the reign was a very conscious decision made by King Philip II, the son of Charles V, in 1561. Part of his choice was due to geostrategic purposes, but there were other reasons as well. In addition to its central location in the centre of Spain, the most important thing was due to the passion of the Iberian monarchs for green spaces. Surrounded by oak forests and pastures, the city was an ideal hunting ground (Figure 7). This appreciation has not changed until today (Garcia-Garcia et al. 2020), but it has been affected by humankind's actions. The Community of Madrid has gone from 64,808 anthropized hectares in 1990, to 126,220 hectares in 2018. This represents a growth of 94.76%, as pointed out in different studies. In other words, artificial surfaces have doubled in less than thirty

years. The Metropolitan Region of Madrid therefore needs planning that allows a new territorial configuration. This means establishing new strategies that take into account the current ecological transition scenario (Sgobbo 2017).

Apart from the protection of green spots, other sustainable ideas have started to flourish. The City Council promotes that the beautiful wilderness should be protected at all costs, which is one of the reasons the City has formulated sustainable measures in recent years. With the local government existing before COVID-19, Madrid took its first steps in this domain. In 2018, the City Council imposed new emissions standards, as well as put a limit on travel. At the moment, 44% of the surface of Madrid is a green space.⁴ This aims to further reduce the carbon footprint of the city. Currently, the city, apart from being focused on green spots or emissions, tries to improve other measures, such as the street light. Madrid is recognised by having the largest street lighting project in the world, which consists of reduction of consumption to become a smarter, more sustainable and a city for citizens.⁵

Figure 7. *Green Slots in Madrid*



Source: <https://urbanmobilityindex.here.com/city/madrid/>.

Nevertheless, COVID-19 has made to emerge other kinds of problems in Madrid, and, unlike the Catalan City, had used tactical urbanism in a different way. Whereas the green part is being realized, the social one has been harder to achieve. Different proposals have been made to equalize Madrid to Barcelona. The urban changes in the last years have been focused on the development of a social urbanism. The changes are centred more on unoccupied spaces than in planning policies following the rules of a citizen laboratory (Besson 2016). In other words, when money from governments runs out, citizens take over. The first example of this was La Latina, one of the neighbourhoods of Madrid, who set to figure with a plot of land resulting from the demolition of a municipal swimming pool in

⁴<https://www.imagina-madrid.es/es>.

⁵<https://ec.europa.eu/environment/europeangreencapital/madrid-street-lighting-project/index.html>.

Campo de Cebada. A space that initially was an empty lot, because there was no public money to try to do anything, it became a spot for citizen activities inside the heart of Madrid. After that, and following also the example of Superislands in Barcelona, Madrid stepped forward with the plan called Imagine Madrid. This project had a goal to explore new forms of intervention in urban spaces through processes of collective creation, particularly between citizens and the artistic fabric.

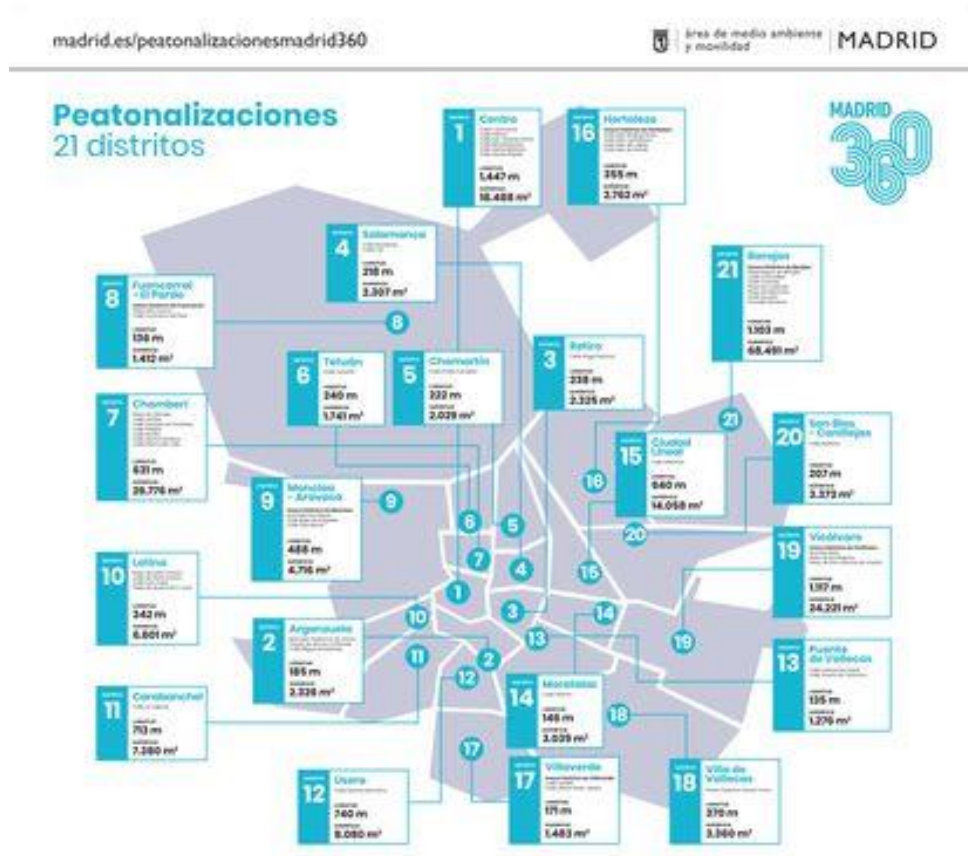
For this first call, nine spots from the surroundings of Madrid were proposed to be changed. A team of artists and creators worked in each of them. Their projects involved new ways of perceiving, narrating and inhabiting these landscapes of daily life, without forgetting the history and the identity of the neighbourhoods. The difference, in comparison to Barcelona, was that these projects looked for the connection with people's feelings. To start, during the spring and summer of 2017, the program collected the memories and feelings that the neighbours had about the nine places: Plaza Rutilio Gacís; Solar Ana María Matute; Solar de Opañel; Plaza de La Vaguada; Plaza de Valdezarza; Calle Topete; Parque de Pradolongo; Mirador Payaso Fofó and Plaza Brigadas Internacionales. Finally, each project was given to a different company, who worked directly over the place with the permission of the neighbours.

One of the examples of this campaign was the actions that took place in Rutilio García Square. Rutilio Gacía is a square away from the busiest areas of the Chopera neighbourhood. For some years, the square was the focus of neighbourhood's petitions who requested a change of use and a revitalization of the area. Sometimes this petition was crossed with proposals to exclude certain stigmatized or racial communities. In this context, the cultural project called *In tune: Rutilio Gacía*, sought from the beginning to turn the square into a place of intergenerational meetings. The purpose was to change the affections that the neighbours feel towards the square. The childhood and the knowledge of young people were the two catalysts in the programme, and from where the rest of the actions were articulated, using also the tools of mediation and community radio.

Once the experience in the surrounding areas of Madrid was checked to be a success, and COVID-19 impacted the other cities, new changes had to be made, particularly in the city centre. As in Barcelona, important roads in the centre of Madrid have definitively dismissed cars and have become pedestrianized. Streets such as Arenal, Montera or Fuencarral, previously crowded with traffic and noise, are now unimaginable spaces until not long ago, where citizens can walk quietly and forget about the bustle of fumes and engines (Figure 8). However, these pedestrianizations have been specific actions, and on occasion, they have been carried out almost without looking for them, since they arose as a result of COVID-19 that forced to cut traffic for keeping distance. Although they must be valued positively, citizenship misses a global action, as a whole, in which the mobility and coexistence model that the City Council wants for the downtown area is clear. For this reason, different proposals have been made. One of them, following the example of Barcelona, suggests the construction of a Pedestrian Island: an area where we can walk without worrying about the presence of cars and enjoy a set of streets without their noise and smoke, as well as enjoy a greener and more humane Madrid.

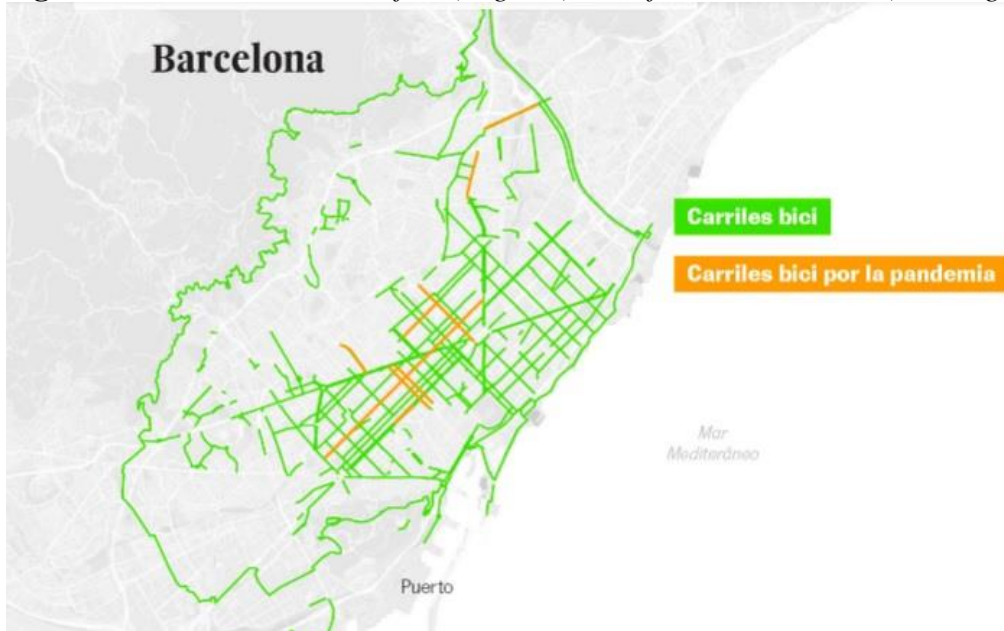
Despite this increase of the presence of pedestrians in the city centres, the most remarkable modification carried out by almost every city is the extension of cycling lanes. Walking or cycling are the only possible options to move in the centre of these big cities due to the “humanization” of them, and the reduction of cars, and, as a consequence, pollution. The commitment to cycling has been happening for years in European cities like Amsterdam, Oslo or Copenhagen, but the pandemic - and therefore the concern of citizens for health and the environment - has driven more and more capitals to follow in their footsteps. During the isolation, Berlin built 27 kilometres of temporary infrastructure (which the far right has taken to court), while London created 30 kilometres of permanent bike lanes. The mayor even promises to multiply this infrastructure by 10 by 2025 throughout the town. Brussels, whose network was 130 kilometres long, has built 40 temporary ones, with which the amount of cyclists has increased by 40%. Lisbon, which had only 105 kilometres in May, wants to double that figure by early 2021.

Figure 8. Pedestrianized Streets in Madrid



Source: Madrid City Council.

Figure 9. Barcelona's Lanes Before (in green) and After the Pandemics (in orange)



Source: El País.

Figure 10. Madrid's Lanes Before (in green) and After the Pandemics (in orange)



Source: El País.

However, not all extensions that have been made are an equivalent. The cycling networks of the ten most populated cities in Spain, and three medium-sized cities (Valladolid, Vitoria and San Sebastián), show that in some of them (like Vitoria, Valencia, Zaragoza, San Sebastian or Seville) it is necessary to have a good network to manoeuvre around safely (Figure 11). On the other hand, other cities (like Madrid (Figure 10), Malaga, Bilbao or Las Palmas) have much less

infrastructure to manoeuvre around the urban fabric. Murcia has more bike lanes per capita than Barcelona (Figure 9), but the network of the Catalan capital is of better quality and more useful. Besides, in comparison to other Spanish cities, Barcelona has added more cycling lane kilometres during the pandemic -21 kilometres in total- in order to reach the level of the rest of European cities.

Figure 11. *Different Safety in City's Lanes*



Source: Journal El País.

All these different proposals and plans might count with the support of most of all citizens— that’s the main reason to develop ways to assess their opinions about new changes, such as online surveys or an online system to send your requests to some city councils. Examples put in practice by Madrid or Barcelona have been followed by other cities in Spain.

In these cases, citizen participation has been essential to regain lost trust in institutions, politics and politicians, a true drama today in most of the countries of the world. If the eminent social character of politics is not recovered, if technocratic elitism is not overcome for the benefit of citizens, their interests and their points of view, the gap between the results of public management and social expectations about it will grow unstoppably.

Conclusion

Since the crisis of COVID-19, people have begun to discuss the architecture and urban planning of a pandemic. Professionals say that confinement will mean a strike point for societies. Some experts agree that perhaps the time has come to modify the way houses are built and designed, and to also think about their interior layout. We have to find solutions so that, within them, we can also be abroad. The transformations of urban structure in a slow way are the key to improving cities and whose changes can be seen through cartography. Digital maps, in the case of Spanish cities, provide a complete view of these changes developed during this pandemic: the cease of tourism houses, development of green and pedestrian areas, enlargement of cycle lanes or exclusion of cars. It is the old view of the city, or the so-called “urban corruption” against the new one. Even among these changes, the perception of rural life, reviled by many in the face of the maelstrom of the big city, is more attractive these days.

Experts are already beginning to consider the answers to these questions, and some cities have even begun to work on their transformation. In almost all of them, there is a constant that we already knew: the transformation that COVID-19

will bring us will consist of accelerating the journey of cities towards sustainability, which is directly related to health.

This article has tried to provide new models of urban environments that facilitate the population's access to the healthiest options in cities. For example, policies that promote sustainable and active transportation—that is, walking or cycling—favor physical activity and reduce sedentary lifestyle, as well as enjoy lower levels of pollution. In addition, the current environment in this type of movement helps prevent the spread of the pandemic because it allows maintaining social distance.

However, despite the clear solution of sustainability, the main problem of urbanism is how to make it possible and durable for a long time. For that, Spanish experts in different fields like cartography, geography, urbanism and architecture, look for the ideal model city, in which an autonomous city and not the smart city, as it was thought lately, has a relevant role. It will be necessary to divide large cities into more-or-less autonomous pieces that are capable of responding individually to the new requirements of an overpopulated and globalized planet. All of this could only be possible together with citizens' agreement, something that consistories are taking into account through different strategies such as surveys.

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Knowledge, Attitude, and Practices (KAP) towards COVID-19 among Older People Living in Informal Settlements in Nairobi City, Kenya

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Informal settlements in developing countries such as Kenya are the least prepared to deal with COVID-19 pandemic due to lack of basic housing, water and sanitation, and overcrowding. The risk is magnified for older people in such an environment due to their advanced age that compromises their immune system, and the fact that they are more likely to have pre-existing health conditions which weaken their body's ability to fight infectious diseases. This study sought to establish older people's knowledge levels, perception, and risk assessment with regard to COVID-19, and adherence to prevention measures. A cross-sectional survey was conducted among 150 respondents aged 60 years and above from two selected informal settlements in the city of Nairobi during the month of August 2020. Primary data were collected using questionnaire and analyzed using descriptive statistics that involved the use of frequencies, totals and percentages. Knowledge of dry cough and fever as COVID-19 symptoms was high, but only 31.5% listed difficulty in breathing. Slightly over half correctly identified elderly people as being at greatest risk of getting severely sick from COVID-19. About 60% were aware that they are at risk of contracting COVID-19. Strong religious belief was the main reason among those who believed they are not at risk. Wearing face masks and hand-washing using soap were the main prevention measures adopted. In conclusion, the study revealed that knowledge about some key symptoms of COVID-19 is still low, and that a considerable number of older people do not think that elderly people are at great risk of getting severely sick. Misconception that a strong religious belief can protect one from contracting the disease is still common among older people. There is, therefore, need for well-tailored and contextualized awareness campaigns to reach this high risk group.

Keywords: *COVID-19, older people, slums, knowledge, behavior*

Introduction

Coronavirus belongs to a family of respiratory viruses that cause common cold, Middle-East Respiratory Syndrome (MERS) and the Severe Acute Respiratory Syndrome (SARS), all of which are zoonotic in origin and induce fatal lower respiratory tract infection as well as extrapulmonary manifestations (Karijo et al. 2020, Chen et al. 2020). The new COV, the coronavirus disease (COVID-19), was isolated and referenced as severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) (Adhikari et al. 2020, Karijo et al. 2020). Its clinical manifestations include fever, fatigue, dry cough, shortness of breath, and acute respiratory distress syndrome (Chen et al. 2020).

COVID-19 pandemic is wreaking havoc across the globe, causing a global health crisis due to its rapid onset, spatial extent and complex consequences (Cheval

et al. 2020). Six major pandemic and epidemic outbreaks have swept the planet between 2000 and 2019, namely Severe Acute Respiratory Syndrome (SARS) (2002–2004), H1N1 influenza (2009), Middle East respiratory syndrome (MERS) (2012–2020), the West-African Ebola virus epidemic (2013–2016), the Zika fever (2015–2016), and Avian influenza (2008–2014). None of these, however, achieved the spatial extent and the widespread impacts that the novel coronavirus has done (Cheval et al. 2020). The World Health Organization declared it a health emergency (Kroupouzou et al. 2020, Sohrabi et al. 2020).

Kenya has not been spared the ravage of this disease (Karijo et al. 2020). The first case of COVID-19 in Kenya was confirmed on 13 March, 2020 (Macharia et al. 2020, Barasa 2020). Since then there were 68,193 laboratory confirmed swab tests and 1,228 deaths with positive test results as of 13 November, 2020 (Kajliwa 2020b). By March 2021 Kenya ministry of health announced a third wave of the COVID-19 outbreak that was totaling over 700 cases a day (Nakkazi 2021). A fear, of a fourth wave as a result of the highly contagious COVID-19 delta variant was reported by June 2021 (Herbling 2021). Currently as at August 17, 2021 there have been 222,894 total confirmed cases and 4,354 cumulative fatalities (RoK 2021). Kenya has the highest number of recorded cases of COVID-19 in East Africa and, despite various confinement measures, infection numbers are yet to be contained. Although there was a drop in cases in the month of September 2021, there has been a surge with positive cases going up to 14% from the second week of October 2020 (Kajliwa 2020a) moving into 2021 and in August 2021 stands at 12.5% (RoK 2021). There is sustained local transmission. The major concerns, according to Barasa (2020), are limited surge capacity of the country's health system and groups of Kenyan population identified as potentially highly vulnerable to infection and/or severe disease, such as the older people living in informal settlements.

Informal settlements are themselves highly susceptible to disease outbreaks. For example, disease outbreaks in the past pandemics have been accelerated in informal settlement settings: the spread of Ebola during the 2014-2016 pandemic was propelled by the densely populated informal settlements in Guinea, Liberia, and Sierra Leone; and Zika took hold in favelas in Rio de Janeiro, Brazil (Snyder et al. 2017, Snyder et al. 2014). The risk is magnified for older people in such environment by not only the poor living environment but also their advanced age that compromises their immune system and the fact that they are more likely to have pre-existing comorbidities such as heart disease, hypertension, diabetes, lung or kidney disease, which weaken their body's ability to fight infectious disease (Daoust 2020). To prevent this pandemic from having serious implications on such highly vulnerable groups, it is imperative to institute effective infection prevention and control measures. Consequently, it is urgent to understand their knowledge, perception, assessment of the risk, and adherence to prevention measures. In this study, we investigated participants from two informal settlements in Nairobi City.

Materials and Methods

This study was a cross-sectional survey of respondents aged 60 years and above from two selected informal settlements in the city of Nairobi. Records of the older people aged 60 and above were obtained from the Nairobi Urban Health and Demographic Surveillance System (NUHDSS) which showed that there were a total of 1829 older people aged 60 and above living in the two slums of Viwandani and Korogocho. From these records a random sample of 150 respondents was drawn to constitute study subjects, taking consideration of age group and sex.

The sample size was calculated based on Kothari's formulae for determining sample size for finite population (Kothari 2004) as illustrated below:

$$n = \frac{z^2pqN}{e^2(N - 1) + z^2pq}$$

Where: n-is the sample size

N-is the population of older people in the two informal settlements (1829)

z-is value found in the table for the desired confidence level of 95% (1.96)

p-is the estimated proportion which has the attribute in question (sample proportion) (0.5)

q-is 1-p

e-is the precision rate or margin of error (8%)

$$n = \frac{1.96^2 \times (0.5) \times (0.5) \times (1829)}{(0.08)^2 (1829 - 1) + (1.96)^2 \times (0.5) \times (0.5)}$$
$$n = 138$$

The sample size was rounded to 150. Random sampling was used to pick respondents from the list obtained from the NUHDSS. Primary data were obtained using a questionnaire which was administered to each respondent by the researcher and research assistants. The questionnaire was used to gather information on the demographic characteristics of the respondents, their knowledge, attitudes and practices toward COVID-19. Health protocols such as wearing face masks, keeping social distance and sanitizing which are required to curb the spread of coronavirus were observed during the administration of the questionnaires. Data were analyzed using the Statistical Package for Social Science (SPSS) software which enabled to the generation of descriptive statistics such as frequencies and percentages.

Results

A total of 150 older people respondents were included in the study. Most (63.3%) of the respondents were from Korogocho informal settlement. This is because it is the larger of the two. The majority (66.7%) of the respondents had resided in the informal settlements for over 20 years, with males being the most predominant group (61.3%). In terms of age, most (55.3%) were between the ages of 60-69 years, with majority (44.7%) married; however, up to 30.7% were

widowed. Most of the respondents had either attained primary level of education (44.0%) or had no formal education (40.0%). Up to 34.0% were unemployed with 28.0% involved only in small trade. Finally, 42.7% lived in households with 2 to 5 members, while 27.3% stayed alone (Table 1).

Table 1. Demographic Characteristics of the Respondents

Characteristics of Respondents	Male		Female		Overall	
	f	%	f	%	f	%
Residence						
Korogocho	50	54.3	45	77.6	95	63.3
Viwandani	42	45.7	13	22.4	55	36.7
Length of residence (years)						
1-9	9	9.8	4	6.9	13	8.7
10-14	8	8.7	4	6.9	12	8.0
15-19	17	18.5	8	13.8	25	16.7
20 and above	58	63.0	42	72.4	100	66.7
Sex						
Male	-	-	-	-	92	61.3
Female	-	-	-	-	58	38.7
Age Category (years)						
60-69	54	58.7	29	50.0	83	55.3
70-79	30	32.6	20	34.5	50	33.3
80 and above	8	8.7	9	15.5	17	11.4
Marital Status						
Married	55	59.8	12	20.7	67	44.7
Single	8	8.7	9	15.5	17	11.4
Divorced/Separated	8	8.7	12	20.7	20	13.3
Widowed (widows and widowers)	21	22.8	25	43.1	46	30.7
Educational Attainment						
No formal education	33	35.9	27	46.6	60	40.0
Primary	41	44.6	25	43.1	66	44.0
Secondary and above	18	19.6	6	10.3	24	16.0
Main Occupation						
Roadside farming	5	5.4	5	8.6	10	6.7
Small trader	20	21.7	22	37.9	42	28.0
Retired former government/private employee	10	10.9	0	0.0	10	6.7
Community/social worker, clergy	2	2.2	3	5.2	5	3.3
Artisan/Jua Kali	13	14.1	1	1.7	14	9.3
Unemployed	29	31.5	22	37.9	51	34.0
Casual/domestic worker, security personnel	13	14.1	5	8.5	18	12.0
Size of household						
Stay alone	30	32.6	11	19.0	41	27.3
2-5	38	41.3	26	44.8	64	42.7
6-10	19	20.7	14	24.1	33	22.0
11 and above	5	5.4	7	12.1	12	8.0

Perception and Knowledge About COVID-19 by Older People

Over 99% (149 out 150) of older people living in informal settlements had heard about COVID-19 (Table 2).

Table 2. *Heard of COVID-19*

Aware/heard about COVID-19	n	%
Yes	149	99.3
No	1	0.7
Total	150	100.0

The older people who indicated that they had heard of COVID-19 reported receiving information on COVID-19 from a wide variety of sources (Table 3). Overall, radio programmes or messages were the most widely cited sources (46.3%). These included radio programmes or shows (27.5%), and government through radio messages (18.8%). These were followed by neighbors (16.8%) and government through T.V. messages (15.4%). Exposure to radio was almost similar for all levels of education; however, neighbors were mainly relied on by those with non-formal education. This group relied less on T.V. programmes as compared to those with higher levels of education. Most male participants (55.5%) as compared to females (31.6%) got information about COVID-19 over the radio. In terms of age, neighbors and radio as sources of information ranked higher with increasing age.

Table 3. *Main Source of Information About COVID-19*

Main source of information	n	%
Neighbors	25	16.8
Friends	4	2.7
Spouse	2	1.3
Government through TV messages	23	15.4
Government through Radio messages	28	18.8
Government officials e.g. chief, community leader	4	2.7
TV through the programmes or shows	11	7.4
Radio through the programmes or shows	41	27.5
Community meeting	1	0.7
Church	7	4.7
Mobile SMS/Internet	1	0.7
Community health workers/volunteers	2	1.3
Total	149	100.0

The study participants had varied knowledge on the symptoms of COVID-19. For example, although knowledge of dry cough and fever which are the top two symptoms of COVID-19 were high at 70.5% and 67.8% respectively, difficulty in breathing was only mentioned by 31.5% of the respondents even though this is a sign of very severe infection (Table 4). Up to 33.6%, 30.2% and 19.5% reported blurred vision, sneezing and sweating respectively yet they are not symptoms of

COVID-19. Knowledge of symptoms of COVID-19 increased with education. For example, 64.4% of those with no formal education listed dry cough, and this was slightly higher for those with primary level of education at 69.7% and rose to 87.5% for those with secondary level of education and above.

Table 4. *Knowledge Regarding COVID-19 Symptoms*

Knowledge about COVID-19 symptoms	n	%
Fever	101	67.8
Sneezing	45	30.2
Sweating	29	19.5
Dry cough	105	70.5
Fatigue	23	15.4
Headache	50	33.6
Blurred vision	8	5.4
Difficulty in breathing	47	31.5
Sore throat	9	6.0
Blocked stuffy nose	1	0.7
Running nose	5	3.4
Vomiting	6	4.0
Feeling of tiredness	15	10.1
Loss of taste	5	3.4
Don't know	2	2.0

Among the older people, knowledge on who is at risk of severely getting sick from COVID-19 varied. For example, 51.0% were able to identify the elderly as at risk of getting severely sick, while up to 61.1% incorrectly believed that everyone was at high risk of severely getting sick from COVID-19. Only 9.4%, 19.5% and 29.5% mentioned people with HIV, young children, and people who are already sick/weak immune system respectively, yet these are groups that have been categorized by health bodies to be at high risk (Table 5). Education had mixed effect on knowledge of the two high risk groups, that is, the elderly and people who are already sick/weak immune system. For example, while knowledge on people who are already sick/weak immune system increased with the level of education (e.g., 27.1% for non-formal, 30.3% for primary level and 33.3% for secondary level and above), that of elderly at high risk decreased with level of education (e.g., 55.9% for non-formal, 50.0% for primary level and 47.1% for secondary level and above). However, knowledge of these two high risk groups was higher among females (e.g., 40.4% and 61.4% respectively) compared to males (e.g., 22.8% and 44.6% respectively). The same trend was noticeable with age category where the results indicated that the knowledge of the two high risk groups was higher among those aged 70 years and above as compared to those below this age category.

Table 5. Knowledge of People at Greatest Risk of Getting Severely Sick from COVID-19

People at greatest risk of getting severely sick from COVID-19	n	%
Everyone	91	61.1
Young children	29	19.5
Elderly people	76	51.0
Young adults	2	1.3
Pregnant women	5	3.4
People with HIV	14	9.4
People who are already sick/weak immune system	44	29.5
People who are obese	3	2.0

The study also sought to know what the older people think about being at risk of contracting COVID-19. Overall, 60.4% believed that they are at risk, while 39.6% do not think they are at risk (Table 6).

Table 6. Own Assessment of Being at Risk of Contracting COVID-19

At risk	n	%
Yes	90	60.4
No	59	39.6
Total	149	100.0

The main reasons given by most of those who indicated that they were at risk of contracting COVID-19 included age (50.0%) and underlying health conditions (40.0%). While those who believed that they were not at risk of contracting COVID-19 indicated mostly that it is because of their strong religious belief (35.6%) and because COVID-19 cases in Kenya might not actually be true (32.2%). The reasons for being at risk of contracting COVID-19 are summarized in Table 7.

Table 7. Reasons for Being at Risk of Contracting COVID-19

Reasons	n	%
Reasons they believe they are at risk (n=90)		
Because of my age	45	50.0
Because of my underlying health conditions	36	40.0
Because everybody is at risk	20	22.2
Because of my living (housing) condition	11	12.2
Because I know people who have contracted the virus	1	1.1
Because I have information about how the virus spreads	25	27.8
Because people where I live do not observe the health protocols against the spread of the virus	18	20.0
Because I don't know how to protect myself against the virus	2	2.2
Because I can't stop relatives/friends/neighbors from visiting me	4	4.4
Because I can't afford the protective measures required against the spread of the virus	9	10.0
I can't remain indoors because I have to go out in order to earn a living and buy food	12	13.3
Others (specify)	4	4.4

Reasons they believe they are not at risk (n=59)		
Because I am healthy	12	20.3
Because coronavirus is the disease for the rich	9	15.3
Because it is a white man's disease	5	8.5
It affects other people not known to me	1	1.7
Because of my strong religious belief	21	35.6
Because I am immuned to it	6	10.2
Because it does not affect people of my age	1	1.7
COVID-19 (coronavirus) cases in Kenya might not actually be true cases but meant to attract funding	19	32.2
Because I stay indoors all the time and take all precautions	13	22.2
Others (specify) e.g., there are a lot of myths around COVID-19	5	8.5

The main fears reported by the older people about COVID-19 according to the results presented in Table 8 are that COVID-19 is a virus that may result in death (40.9%), and that there is no cure or treatment (20.8%). The least reported fears were being afraid of infecting others (1.3%), loved one may get ill (2.0%), and that many people under-estimate the disease (3.4%). Fear of death was slightly higher among those aged 70 to 79 years (42.0%) compared to those aged 80 and above (37.5%) and those aged 60 to 69 (41.0%). In terms sex, more males (41.3%) than females (40.4%) feared death.

Table 8. Main Fear Regarding COVID-19

Main fear	n	%
Death/virus kills people	61	40.9
No cure or treatment	31	20.8
Loss of income	10	6.7
Food shortage	12	8.1
I may infect others	2	1.3
Many people under-estimate the disease	5	3.4
Loved one may get ill	3	2.0
It may infect too many people and turn uncontrollable	6	4.0
People losing their jobs and livelihood	8	5.4
Getting quarantined	6	4.0
Others (specify)	3	2.0
I have nothing to fear	2	1.3
Total	149	100.0

Asked about the behavior they have adopted in response to COVID-19 pandemic, the majority of the study participants reported that they mainly wear face masks when outdoors (73.2%) and wash their hands more frequently using soap (69.8%) as away to avoid contracting COVID-19. But less than 50% stopped attending social gathering, keeps distance, stays indoors, and avoids greeting with hands (Table 9). Overall, men and those with higher education wore face masks and washed their hands frequently. However, this was reversed considering age where the lower age categories had adopted more of the response behavior than the older ones.

Table 9. Behavior Adopted in Response to COVID-19 Pandemic

Behavior	n	%
Staying indoors	40	26.8
Stopped attending social gathering	55	36.9
Keep distance of at least 1.5m while in public places	55	36.9
Inform people of illness symptoms	4	2.7
Wash hands using soap frequently	104	69.8
Use hand sanitizer frequently	33	22.1
Always wear face mask when outdoors	109	73.2
Stop greeting people by hand	35	23.5
Sneeze on a closed elbow	5	3.4
Others (specify)	6	4.0
Do nothing	2	1.3

In response to what they would do if they developed symptoms similar to those of COVID-19, most study participants indicated that would go to clinic (79.2%). Only 20.1% noted that they would call the government toll free hotline number, and less than 15% reported that they would keep distance, go for test, stop attending social gatherings or stay indoors (Table 10). Men were less likely (12.0%) to go for test as compared to women (15.8%). Similarly, those with less education (10.2% non-formal and 12.1% primary level) were less likely to go for test. In terms of age, the percentage of those who would go for test were higher among those aged 60 to 69 years, decreasing to 14.0% for those aged 70 to 79 years and none among those aged 80 years and above.

Table 10. Behavior Adopted if you Had Symptoms Similar to Those of COVID-19

Behavior	n	%
Go to clinic	118	79.2
Staying indoors at home more	16	10.7
Call toll free number	30	20.1
Inform neighbors	6	4.0
Inform friends	6	4.0
Inform spouse	6	4.0
Go for test	20	13.4
Keep distance	22	14.8
Stop attending social gatherings	17	11.4
Informs people of illness symptoms	7	4.7
Others e.g. buy medicine to manage symptoms	3	2.0
Do nothing	1	0.7

Discussion

Evidence has shown that older people are the most vulnerable population group to COVID-19 pandemic (Daoust 2020). This situation is accentuated for those living in informal settlements in developing countries like Kenya, because living and sanitation conditions in these areas are poor, coupled with high population density, small dwelling and very low income among residents. They

are, therefore, the most poorly equipped for the COVID-19 and the most at risk for transmission (Austrian et al. 2020). Consequently, attitude towards COVID-19 and compliance toward preventive measures among older people living in informal settlements will have a greater effect of minimizing the spread and its attendant severe illness and death among this very highly vulnerable group. To facilitate a mechanism through which the government can engage this group in COVID-19 response we conducted a survey to provide information on the level of their knowledge, perception, and assessment of the risk of COVID-19, and adherence to prevention measures. The study showed that almost all study participants had heard or were aware of COVID-19 pandemic. This means that the daily updates from public health agencies in Kenya, and government efforts to enforce measures to curb the spread of the disease have ensured that even older people living in informal settlements get to know about the existence of the disease (Hagger et al. 2020). The most important source of information about COVID-19 for the older people living in the informal settlement was radio. This is in contrast with studies targeting the general population (Hager et al. 2020) or the youth (Karijo et al. 2020) that have shown that the social media (internet) and TV were the main sources of information about COVID-19. This could be attributed to the fact that older people are less likely to use mobile phone or internet technology because they are late adapters to technology. Furthermore, T.V. ownership among residents of informal settlements and especially older people is low. This, therefore, means that to effectively reach the older people living in informal settlements with messages on COVID-19 pandemic, response teams should prioritize the use of radio.

The study revealed that most participants were able to identify two important symptoms of COVID-19, but few accurately identified difficulty in breathing, a key symptom which signifies critical illness and potential need for hospitalization (Austrian et al. 2020). For the older people, not being able to correctly identify this symptom can be fatal in a short time. Overall, response teams need to develop communication strategies that can better educate the older people on the key symptoms of COVID-19 in order to increase their knowledge and empower them to seek help from health facilities when they notice these symptoms.

Slightly over 50% of the participants correctly identified the elderly as those at greatest risks of getting severely sick from COVID-19, and fewer (less than 30%) listed those with compromised immune system. Emphasizing that this group is at very high risk can help the older people and the people around them better prioritize and take steps to protect this group. About 60% of the participants felt that they were at high risk of infection. However, this leaves out about 40% of this highly vulnerable group with a false feeling that they are safe at a time when second wave in COVID-19 infection and deaths is being experienced in Kenya (Sanga 2020). Although the perception of being at risk to COVID-19 among the study participants was higher than those recorded in a previous study (35%) carried out by Austrian et al. (2020) among general adult population in informal settlement in Kenya at the end of March 2020, there is indication that several months after the first case of COVID-19 was reported in Kenya, risk perception among vulnerable population groups like older people has not reached the desired level, and,

therefore, should be of concern. Such a scenario requires concerted effort by health and other government officials to sensitize the older people being a high risk group. The apathy which is the result of the perception that they are not at risk, according to the finding of this study, arose from the fact that the study participants felt that they had strong religious belief, so God would protect them, and also the false but commonly spread rumour among a section of Kenyan population that the government is using COVID-19 positivity figures to attract funding from donors. A previous study by Karijo et al. (2020) in April 2020 among the Kenyan youth had revealed similar myth on the belief about God's protection from the risk of contracting COVID-19. Such myths and misconceptions are a threat to curbing the transmission of COVID-19 pandemic and a great danger to a vulnerable group like the older people living in informal settlements. This calls for strengthening messaging to eliminate them.

Most participants expressed concern about death from COVID-19. This was higher among those who had not reached 80 years. Loss of income that had been reported as a major concern in a previous study in informal settlement in Kenya (Austrian et al. 2020) was reported by few older people in the current study. This could be attributed to the fact that unlike the other sections of the society older people rely on government cash transfers, relatives and well-wishers. Therefore, direct effect on income is not pronounced. Government actions need to sustain and even increase cash transfers to older people in order to reduce the risk of older people exposing themselves to the virus when they go out to seek employment or other income generating activities.

Many participants indicated that the main steps they have adopted to avoid contracting COVID-19 were wearing face masks and frequently washing hands using soap. However, many were not taking steps like avoiding social gatherings, keeping distance and staying at home. Yet these are some of the recommended behavior to avoid contracting the disease. These precautionary measures are key in reducing the spread of the virus in already densely populated informal settlements, and to high risk groups like older people. It is critical that the government messaging regarding steps to be taken to avoid contracting COVID-19 should be packaged to target specific groups like older people. Over three quarters of study participants indicated that they would go to clinic if they developed symptoms similar to those of COVID-19. But of concern is that only a few would go for test, keep distance or stop attending social gathering. Meaning they would transmit the virus to others. The finding that most informal settlements residents in Kenya would go to clinic if they developed symptoms are similar to those of Austrian et al. (2020). Meaning that World Health Organization's (WHO) guidance on staying at home and calling a health provider if symptomatic to avoid overcrowding health facilities has not been understood well by most people living in informal settlements.

Conclusion

Our study revealed that although almost all older people living in informal settlements in Nairobi city have heard about COVID-19, knowledge on symptoms,

risk and preventive measures are not that high. There is, therefore, need for well-tailored and contextualized awareness campaigns to reach this high risk group. Strategies to ensure older people adopt and sustain appropriate preventive measures will be critical in reducing the impacts of the virus on older people living in informal settlements.

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The Structural Conditions for the Expansion of COVID-19 in Peru

Jan Lust

Peru is one of the most affected and infected countries by COVID-19. The expansion of the virus could not be contained by lockdowns and states of emergency. The re-opening of the economy increased the expansion of COVID-19. We argue that the role of Peru in the international division of labor is not only the structural condition for the persistence of labor precariousness in the country, but also the principal cause for the expansion of COVID-19 in Peru. Labor precariousness and the expansion of COVID-19 are the expressions of the country's economic and business structure. An economic structure heavily dependent on the non-tradable sectors and a business structure dominated by micro business undertakings, characterized by low productivity levels, do not permit the eradication of precarious labor conditions as economic growth hinges on economic progress abroad and precariousness is the source of profit of micro companies. The persistence of labor precariousness impedes the containment of COVID-19. Labor precariousness expressed in wages at the subsistence level and the lack of labor stability in the formal sector, in combination with the structural character of informality have been the catalysts for the expansion of the virus. We demonstrate that COVID-19 is not a democratic virus but a class virus. For Metropolitan Lima, districts with a more than average rate of informality have also a more than average rate of COVID-19 infections. The neoliberal development model has been responsible for the incapacity of the government to implement measures in accordance with the country's social and economic structure that might have contained the expansion of COVID-19. This model is the expression of Peru's function in the globalized world, the relation between this role and the country's economic and business structure, the functionality of the extractive development model for the Peruvian State, and the correlation of class forces within and outside the state apparatuses.

Keywords: *Peru, COVID-19, labor precariousness, international division of labor, neoliberal development model*

Introduction

At the end of December 2019 the world was notified about the existence of a new coronavirus in the city of Wuhan in China. This virus, SARS-COV-2 (COVID-19), rapidly spread and was declared a pandemic by the World Health Organization (WHO) on 11 March 2020. In response, Peru was the first country in Latin America to implement a nation-wide lockdown and strict quarantine measures. These measures were implemented through a declaration of a state of emergency, with the military and the police charged with controlling the population. This situation lasted for 3.5 months, from mid-March 2020 to the end of June. However, because of the expansion of the virus, in some regions the lockdown continued. In the

whole of the country, the government of Martin Vizcarra maintained the prohibition on leaving one's residence between 10 pm and 4am.

This early response has not prevented the expansion of COVID-19 in the country. Currently (23 March 2021), Peru is ranked nineteen on the world ranking of the number of individuals infected by the virus. The slow but determined reopening of the economy seems to have increased the number of COVID-19 infections. Physical social contacts between economic agents augment the possibility for the virus to expand.

The expansion of COVID-19 in Peru during the lockdowns and now in times of the almost completely re-opened economy, appears to demonstrate the class character of the virus. Although the economic, social and health effects of COVID-19 might be diminished through concentrated efforts by the state apparatuses, the most affected are the salaried and non-salaried working class, in formal and informal situations, and self-employed workers.

The principal objective of this article is to show that the role of Peru in the international division of labor is not only the structural condition for the persistence of labor precariousness in the country, but also the principal cause for the expansion of COVID-19 in Peru. Labor precariousness is the transmission mechanism of COVID-19 expansion in Peru. A structural condition is a condition that is fundamental for non-structural conditions to help certain political and social developments, processes, and/or phenomenon to occur.

The expansion of the virus has a socioeconomic and class background. While it seems that the virus was brought into the country by travelers pertaining to what might be called the accommodated social classes, it rapidly turned into a disease of the laboring classes. First of all, these classes did not have the option to stay at home during the lockdowns as was mandated by law. Second, as the big majority of these classes perform manual labor, in general they are not able to do this work at home and, hence, they are more likely to be exposed to the virus. Third, the conditions for the expansion of the virus might have been eliminated if the government would have decided to actively intervene in the economy instead of providing late and uneven financial alleviation and repressing the population who have no other way to search for a job, income, and nutrition than by leaving their houses.

This paper intends to advance the discussion within the social sciences regarding the economic and social conditions for the expansion of COVID-19 in peripheral countries that are economically depended on their extractive economic sectors, especially the mining sector, and have implemented a neoliberal development model. Although we believe that economic conditions determine the social conditions for the expansion of the virus, both conditions are interrelated. Hence, in order to contain the virus, it would have been necessary that a coherent and interrelated set of structural economic and social measures would have been implemented that might have been able to eradicate the economic and social basis for the expansion of the virus. We analyze household surveys, statistical data on economic and labor development, and correlate data on employment in micro companies and the number of own-account workers to the rate of COVID-19 infections.

The data we use in this paper to demonstrate the expansion of COVID-19 within the laboring classes has been limited to Metropolitan Lima, which is the most infected area in Peru. We rely on data from this area because it is the most reliable data and most accessible. Furthermore, data on the rate of labor informality at district level is able to be constructed and the social heterogeneity of Metropolitan Lima permits an analysis of districts that are heavily infected by COVID-19 and contain above average rates of labor informality, and thus enable a comparison between these and districts that are less infected by the virus and where the labor force is not principally informal.

As such this work is structured in five sections. Section one provides a panoramic view on the expansion of COVID-19 in Peru and discusses the expansion of the virus and its effects. Section two argues that the neoliberal conception of the State disabled the Peruvian Government's ability to implement effective measures that might have contained COVID-19. In section three we examine the structural conditions for COVID-19 to expand and to maintain its devastating health effects until an adequate vaccine against the virus has been implemented. Section four delves into the relation between informality and COVID-19 in Metropolitan Lima. It demonstrates that the expansion of the virus is principally located in what might be called the capital's working-class districts, characterized by above average rates of informality. In section five we present our conclusions.

The Rise of COVID-19 and its Effects

On 16 March 2020, the Peruvian government declared the state of emergency for the whole of the country in order to contain COVID-19. Three days later a complete and total lockdown began. Only pharmacies, grocery stores, supermarkets, public marketplaces, and banks were accessible to the public. Essential state institutions maintained in operation though were not open to the public.

During the lockdown, the military and the police were in charge to control the movements of the population. A curfew was implemented restricting people to their house from 5 p.m. until 6 a.m. the following day. On Sundays the lockdown was 24-hours.

As a response to the continuing expansion of the virus throughout the whole country, after months the lockdown measures were sharpened. In some parts of the country the curfew started earlier, and the use of face masks became mandatory when leaving one's residence.

The end of the total lockdown in July 2020 and the subsequent reopening of the economy (semi-lockdown) has not meant that all measures to contain the spread of the virus were also lifted. At the time of writing, the use of face masks is still mandatory and new restrictive measures are to be expected, at the same time maintaining the state of emergency in force, in order to reduce infections caused by the "Second Wave" and the possible "Third Wave". The lockdown measures vary according to the rates of COVID-19 infections.

Despite these efforts, the Peruvian regime has not been able to control the virus and the death toll. In Latin America, Peru occupies the fifth position regarding the number of COVID-19 affected individuals, after Brazil, Colombia, Argentina, and Mexico. In August 2020 the country rated as the world's number one country in terms of mortality rate.¹ It was only since mid-September 2020 that the State was finally getting some control over the virus when daily reported positive cases started to reduce. However, the "Second Wave" of COVID-19 infections is putting the clock back at the time when the State was incapable to really fight the virus. In the last months the number of infections and deaths are rapidly increasing. The process of vaccination is very slow and has been subject to corrupt of authorities.

Even though the Peruvian government has been praised for its quick response to COVID-19, the lockdowns did not impede people from getting infected. As a matter of fact, what the lockdowns should have impeded was actually taking place during all these months of supposed social distancing. The first reopening of the economy (July 2020) directly increased the daily number of infections. 8.000 to 9.000 infections a day became rule. Currently (January-March 2021), the number of deaths and infected is comparable with the most dangerous periods of 2020.²

Although leaving one's house was restricted to the purchase of the necessary food and to do financial transactions, a major part of the population, principally in working class districts, did not abide to these rules. In addition, the military and the police were not able to impede a massive number of people from 'trespassing'.³ The use of force to control the population might have met violent responses.

It is possible that the government foresaw an increase of informality and massive unemployment as a consequence of the lockdowns. It is to be expected that the loss of jobs and the lack of a universal social security system that would have protected individuals against the financial consequences of unemployment, has increased informality as the informal sector is the only social security individuals have when their employers or their own businesses have to close.⁴ At mid-August 2020, the unemployment rate in Metropolitan Lima reached 16.4%, a more than 100% increase since March 16. Half December it had reduced to 15.2% (INEI 2020c, p. 1).⁵ However, not only did unemployment increase, also the labor force participation rate dropped (Weller et al. 2020, pp. 18, 20). Moreover, the government did not account for the health consequences that an increase of informality and unemployment might have on the population. The search for jobs,

¹On 22 March 2021, Peru ranked seventh on the world ranking of COVID-19 mortality rates. Source: <https://coronavirus.jhu.edu/data/mortality>. [Accessed 29 January 2021]

²Source: <https://gestion.pe/peru/covid-19-exceso-de-fallecidos-bordea-los-300-casos-por-dia-seg-un-datos-del-sinadef-noticia/>. [Accessed 20 January 2021]

³Source: https://www.clarin.com/mundo/coronavirus-peru-vendedores-ambulantes-esperan-fin-cua-rentena-toman-calles_0_jh5yCTC8w.html. [Accessed 28 August 2021]

⁴According to data of the International Labour Organization (ILO), informality is on the rise in Peru. In June 2020 it had increased 1.7 percent points in comparison with June 2019 (OIT 2020, p. 3). In March 2021 the rate of informality was estimated between 75% and 80% of the occupied active population, in <https://udgtv.com/noticias/informalidad-laboral-aumento-peru-menos-75-pan-demia/>. [Accessed 16 March 2021]

⁵See also: <https://es.investing.com/economic-calendar/peruvian-unemployment-rate-516>. [Accessed 29 January 2021]

income, and food by the informal and recently fired working classes have driven them into positions that expose them to catching COVID-19.

The only relief strategy the government implemented was that of short-term financial assistance. In May and June 2020, the poor, the extremely poor and the self-employed workers, about 7 million families (Vergara 2020), received a subsidy of around US\$ 210. In August, again a subsidy of US\$ 210 was handed out to what are called the most vulnerable families. However, this amount was not enough to finance the monthly basket of basic foodstuffs for a family of four. In 2019, the poverty line stood at around US\$ 390 per month. Thus, the subsidy of US\$ 210 is actually closer to that of being in extreme poverty, for the extreme poverty line for a family of four is set at US\$ 207 per month. In February 2021, a subsidy of US\$ 170 was starting to be handed out to about 4.2 million poor families.

The decision to reopen the economy in July 2020 was primarily economically grounded. In the second trimester of 2020, the Gross Domestic Product (GDP) had reduced with 30.2%. In the first semester GDP already fell with 17.3%. This decrease was not only the product of the almost complete standstill of the national economy (a drop of internal demand with 27.7%), but it was also the result of reduced economic growth of its most important commercial partners, principally China that even saw its economy decrease in the first quarter of 2020. This caused, according to statistical data of the Peruvian Central Bank and the National Institute for Statistics and Informatics (INEI 2020b, p. 4), a global reduction for the prices of the country's mining products (followed by a weak recovery) and export volumes, Peru's main export products.⁶ In the second trimester, total export value decreased by 40.3%. Gold reduced by 51.6%, zinc by 49.7%, copper by 40.7% and lead by 22.4% (INEI 2020a, pp. 1, 7). Data for 2020 show that GDP has fallen with 11.2%.⁷ The number of exporting companies diminished with around 13%.⁸

The principal sources of income of the Peruvian State are Value Added Tax (VAT) and income tax. The economic, social and sanitary crisis reduced governmental income from both sources and increased governmental expenditures in healthcare and financial assistance to the most vulnerable families. The result will definitively be a phenomenal increase of the country's fiscal deficit. The Peruvian Central Bank (Banco Central de Reserva del Perú 2020a, p. 81, 2020b, p. 87) expects for 2020 a fiscal deficit of 8.6%, up from 1.6% in 2019. In the first semester the deficit was already 6.7%.

The reopening of the Peruvian economy not only caused an increase of COVID-19 infections due to reduced social distancing at the workplace, but also because of the increased use of public transport. The lack of regulation and enforcement of this industry has led to an intense competition between private transport companies. Prices are also too low to properly finance the transport of

⁶It should be underlined that the commodity prices were already falling before the COVID-19 outbreak in Peru (Tröster 2020, pp. 5–7, IDB 2020, p. 3). According to the International Development Bank (IDB), starting from early 2019 goods exports from Latin America were reducing (IDB 2020, p. 2).

⁷Source: <https://www.eleconomista.com.mx/economia/PIB-de-Peru-cayo-11.12-en-2020-peor-dese-mpeno-en-tres-decadas-20210215-0062.html>. [Accessed 16 March 2021]

⁸Source: <https://portalportuario.cl/peru-cantidad-de-empresas-exportadoras-disminuye-125/>. [Accessed 16 March 2021]

citizens at current international standards of safe public transport. These companies are not really abiding to these standards and the Peruvian citizens are not complaining in order not to face increasing prices in these times of economic recession. Especially in the working-class districts safe public transport is non-existent.

The Peruvian State and COVID-19

Since the 1990s, Peru has been ruled by firm neoliberal governments such as those led by Alberto Fujimori (1990-2000), Alan García (2006-2011) and Pedro Pablo Kuczynski (2016-2018) or regimes that coupled market-oriented policies with programs of social inclusion like the governments presided by Alejandro Toledo (2001-2006) and Ollanta Humala (2011-2016). In general terms, all these governments considered the market the principal mechanism to distribute the wealth produced in the country. The neoliberal constitution of 1993 radically reduced the role of the Peruvian State in productive activities.

The pandemic demonstrates that only the State has sufficient power to impose measures in order to contain COVID-19, to finance the economic consequences of the expansion of the virus and to develop a vaccine. The State is not only fundamental for the economic reproduction of the system, but also for its social and ecological reproduction.

The effects of COVID-19 demonstrate that in the last 20 years social progress in Peru has been very thin, although the size of the Peruvian economy, measured in real GDP, in the years between 2000 and 2019 increased with around 145%. There are definitively more shopping malls, more cars, more credit card holders, and more internet connections than 20 years ago, however informality and underemployment have maintained high. While in 2002 it was estimated that 85.3% of all employed workers were informal workers (Gamero Requena and Carrasco n.d.) and 42.9% of the Economically Active Population (EAP) was underemployed (Murukami 2007, p. 430), in 2019 still 72% of the EAP was informal (Lust 2020, p. 323) and 42.5% was underemployed⁹. In the period 2000-2018, that includes the years of impressive economic progress triggered by the commodities boom in the period 2005-2011 (Lust 2019a, p. 1234), the Gini coefficient only reduced with a bit more than six points, i.e., from 49.1 in 2000 to 42.8 in 2018¹⁰.

During 2020 the demand for oxygen and medicines to combat COVID-19 increased phenomenally. As this increase was not matched by a corresponding increase of supply, prices rose spectacularly. In Peru, many people have died because of a scarcity of medical oxygen or for not having sufficient income to pay

⁹Of course, during the pandemic the rate of underemployment must have increased significantly (Weller et al. 2020, p. 24).

¹⁰Source: <https://datos.bancomundial.org/indicador/SI.POV.GINI?locations=PE>. [Accessed 12 October 2020]

for the dramatic price increases of medical oxygen.¹¹ Cases are registered in which patients have been asked to take their own oxygen to the hospital.¹²

The lack of supply is principally the consequence of the ideology of non-intervention in the markets. The market of oxygen is dominated by two companies that do not have the capacity and/or the interest to produce more oxygen.¹³ And although the State, in August 2020, took some measures to increase the production of oxygen,¹⁴ it was just recently (end of January) that oxygen plants were implemented in some hospitals. The Peruvian State has not taken measures to ensure the production of oxygen for the population that needs it for their families at home (the mass of the COVID-19 infected individuals). Oxygen was starting to be imported from Ecuador and Chile.

The reduced role of the State in the economy and the preference of market-based solutions to social problems or a healthcare system that for one part is based on the market mechanism (private healthcare) and for another part is public (with differentiated units for salaried workers and informal workers), is for a considerable part responsible for the collapse of public healthcare. The permanent shortage of intensive care units and hospital beds in public hospitals causes that many individuals infected by the virus are attended in wheelchairs outside the hospital buildings, in tents in the hospital's parking lots or not at all and stay at home connected to big oxygen cylinders. In addition, there is a lack of doctors and nurses (Caretas 2020).

Notwithstanding the fact that the pressure on public healthcare is immense, its collapse is not only due to increased demand, but also to the continued lack of support from the different governments. Governmental expenses in healthcare are not near to what is expected by the Pan American Health Organization. In the last two and half decades, only between 4% to 5.5% of GDP was expended on healthcare. Furthermore, the country has a low number of intensive care units (ICU), principally located in its capital city Lima, and a scarcity of professionals to work in the ICU's (Schwalb and Seas 2021, p. 1).

In this context it is interesting to observe that, when we compare Peru with Uruguay at the moment of writing, in Peru the total number COVID-19 infections stood at 1.472.790 and 50.339 people had died from the virus, in Uruguay the number of accumulated confirmed COVID-19 cases was 84.230 and 811 deaths.¹⁵ Uruguay spends around 9% of its GDP to healthcare (Vergara 2020, pp. 7–8)¹⁶.

¹¹In August 2020, the government took measures to increase the production of oxygen, in https://www.eldiario.es/sociedad/peru-espera-reducir-la-escasez-de-oxigeno-con-65-nuevas-plantas_1_6176562.html. [Accessed 26 August 2020]. At the end of January, oxygen plants were implemented in some hospitals.

¹²Source: <https://especiales.elcomercio.pe/?q=especiales/la-crisis-del-oxigeno-en-el-peru-ecpm/index.html>. [Accessed 26 August 2020].

¹³Source: <https://ojo-publico.com/1842/dos-companias-globales-dominan-negocio-del-oxigeno-en-peru>. [Accessed 17 March 2021]

¹⁴Source: https://www.eldiario.es/sociedad/peru-espera-reducir-la-escasez-de-oxigeno-con-65-nuevas-plantas_1_6176562.html. [Accessed 26 August 2020]

¹⁵Source: <https://coronavirus.jhu.edu/map.html>. [Accessed 23 March 2021]

¹⁶See also: <https://www.bbc.com/mundo/noticias-52843655>. [Accessed 11 January 2021]

The idea that the private healthcare system should function in combination with public healthcare has created a segmented healthcare system, that is, a healthcare system according to income. As the mass of the population is attended in the public healthcare system, the capacity of the private system has been limited. The collapse of the public system would not be mitigated by the capacity of the private healthcare system.

The Structural Conditions for the Expansion of COVID-19 in Peru

The principal role of Peru in the international division of labor is to provide the country's raw materials for productive processes abroad, predominantly to transnational corporations that originate in the advanced capitalist countries and China. Its secondary function is to participate in the globally organized value chains.

Economic growth (and slowdown) is mainly the consequence of increasing demand for the country's natural resources and rising commodity prices in international markets. Metal minerals are by far the country's most important export products. The motors of economic growth in Peru are concentrated in a few large exporting companies, principally mining corporations (Lust 2020, pp. 6–7).

Peru's chief role in the globalized capitalist world has been translated into the extractivist economic development model that is in place since the 1990s. It is believed that lasting economic progress can be attained through a model based on the export of the country's commodities and foreign investment in, principally, the mining sectors.

In order to 'operate' the current development model and to 'comply' with the country's assigned principal role in the international division of labor, only a very small part of Peru's EAP is necessary. In addition, as argued by Palma (1988, p. 37), the role of countries at the periphery of the world capitalist system, such as Peru, does not permit 'sufficient' accumulation to provide employment for all.

In 2018, around 70% of the EAP was not necessary to 'run' the economic development model based on the export of the country's commodities and investments in the extractive sectors, principally the mining sector. The sectors and branches that are directly and indirectly needed to comply with Peru's function in the globalized capitalist world such as mining, transport, communication, finance, manufacturing, water, gas, electricity, private and social community services, and the state sector (excluding public education), provide employment to about 30% of the EAP (Lust 2020, p. 323).

Peru's particular economic structure is product of the country's principal role in the international division of labor. In 2019, the non-tradable sectors such as electricity, water, construction, commerce, and most of the services, contributed with more than 60% to GDP. This is all understandable as there does not exist any real interest in the development of high value-added exportable goods and services by national and international capital. The most important tradable sectors pertain to the extractive sectors. The non-tradable sectors are too weak to stimulate economic growth as their own prosperity depends on economic progress abroad and because the country's internal markets are too small to provide an "autonomous

internal push for new and/or extended economic activities in the non-tradable sectors” (Lust 2020, p. 324, Lust 2019a, p. 1235).

Peru’s business structure is dominated by what are called very small companies. According to the country’s National Institute of Statistics and Informatics (INEI for its acronym in Spanish), in 2018 94.9% of all private enterprises were micro companies, defined as businesses with annual sales not higher than US\$ 176.400 (S/. 622.500) or less than 150 Taxation Units and 4.2% were small companies (annual sales between 150 and 1700 Taxation Units). In absolute numbers these were 2.370.856 small and micro companies (INEI 2019, p. 22). In 2018, about 72.4% of the EAP worked in micro companies, defined as corporations that employ between one and ten individuals.

The around 70% of the EAP that is not directly necessary to operate the economic model, are laboring in what we call the capitalist subsistence economy (CSE). The CSE is an “economy of micro-enterprises characterized by low levels of productivity and expressed in remuneration rates at or near (below or above) the minimum wage level” (Lust 2019b, p. 782).

In part, the CSE can be seen as a social security network as it provides employment for all those who have not been able to find a job in the advanced economy. The CSE is not only a provider of employment, but also the necessary starting point, and most of the time also the end point, of emerging micro businesses. On the other hand, the CSE is functional for the development and the profitability of the advanced economy as it is “a key provider of labour and materials (at low costs) for the advanced economy”, “the principal supplier of the goods and services for the reproduction of labour-power in the advanced economy” (Lust 2019b, p. 786), and executes outsourcing functions for the advanced economy. Most of the individuals infected by COVID-19 are employed in the CSE.

Individuals who are employed in what we have called the advanced economy are, in general, laboring’ in medium-sized and big companies. It’s the advanced economy that receives most of the foreign direct investments¹⁷ and is composed of the principal exporting sectors and companies.¹⁸

Without the lockdowns, the Peruvian economy would also have been hit hard by the outbreak and worldwide expansion of COVID-19. Not only through the reduction of the export of mining products due to diminishing demand in the Global North¹⁹ and the reduction of the commodity prices, but also through its insertion in the globalized value chains organized by transnational capital. As a

¹⁷Data for the period 2008-2018 for instance, show that the three principal foreign direct investments (FDI) receiving sectors were mining, finance, and communication. The energy sector and the industrial manufacturing sector alternated to occupy the fourth place in importance (Source: <https://www.proinversion.gob.pe/modulos/LAN/landing.aspx?are=0&pfl=1&lan=10&tit=institucional-popup>; accessed 03/05/2020).

¹⁸In 2018, 2.836 big companies contributed with 96.1% to total export value. The participation of 2.782 micro business was 1.0%. (Ministerio de la Producción 2020, pp. 12, 32, 91)

¹⁹“The Global North consists of those countries that used to be called advanced capitalist countries. These countries form part of the Organisation for Economic Co-operation and Development (OECD). However, not all OECD member states are advanced capitalist countries. Although China is not considered an advanced capitalist country and is not a member of the OECD, on the basis of its global economic power we consider it part of the Global North.” (Lust 2019b, p. 791)

matter of fact, the emergence of a mass of micro businesses is not only the consequence of Peru's main role in the international division of labor, but also of the worldwide restructuring of productive processes since the start of the economic crisis of the 1970s (Lust 2020, pp. 318–319, 327).

The Peruvian micro businesses are not only nationally oriented, also a number of them are incorporated in globalized productive process. In the context of a business structure dominated by micro companies, outsourcing is a highly lucrative strategy to increase profits. Fierce price competition caused by the huge number of micro enterprises, a surplus of workers that exerts downward pressure on wages, and a labor legislation that attempts to reduce the labor costs of micro enterprises (Lust 2020, p. 4), provide the basic conditions for profitable outsourcing.

The worldwide reduction of productive activities and the drastic restrictions on international transport, have meant an important blow to the global value chains. Complete supply chains came abruptly to a halt as the chain cut. For this reason, it can be argued that through their worldwide insertion in globalized productive processes, the Peruvian workers in micro business or self-employed workers might have contributed to the expansion of COVID-19 as it urged them to 'trespass' the regulations regarding social distancing when the global value chains broke down.

The reopening of the economy has principally been the restart of the activities of large companies. Of course, since July 2020 not only large but also small and medium-sized companies have restarted their businesses. However, in the case of micro businesses a restart of activities is a very difficult question. As most of these companies are of precarious nature, lots of them have closed down permanently. Furthermore, the sanitary regulations to which companies have to abide before they can reopen are very difficult to finance by these companies.

The economic problems of micro enterprises can be clearly illustrated when we analyze the data of companies that have received loans against an average interest rate of 1.69% in the context of the reactivation of the economy.²⁰ Although the majority of these companies were micro or small businesses, it is but a very small part of the total number of micro and small companies in Peru. Data of the Peruvian Central Bank for October 2020 show that only 471.642 of all small and micro businesses received a loan, i.e., 19.9% of all micro and small companies according to the total number of these companies in 2019.²¹

The lockdowns caused the doors to close of micro companies, medium-sized enterprises, and big corporations. Massive layoffs are currently allowed by the government. Individuals working in micro businesses were directly fired and workers in medium-sized and big corporations maintained their salaries, saw their wages reduced or were also fired, temporarily laid-off or their working hours reduced. Data for Metropolitan Lima show that in July 2020 around 50% of the total jobs lost during the lockdowns, around 1.7 million, were in companies that

²⁰Of course, not all micro businesses that restarted their activities asked for financial support. However, it is a strong indicator for the economic strength and weakness of these companies as the average interest rate lies around 1.69%. In other words, it is very lucrative or convenient to ask for a loan. Data on how many micro and small companies currently operate is not available.

²¹Source: <https://gestion.pe/economia/bcr-reactiva-peru-alcanza-ya-480122-empresas-98-de-ellas-mypes-noticia/>. [Accessed 23 March 2021]

employed between one and ten individuals. Also, in the case of adequate employment²², individuals working in micro enterprises had to pay the biggest price. Adequate employment reduced by almost 70% (INEI 2020c, pp. 2, 6, 12).

It is the character of the Peruvian economy that can explain this dramatic situation for the mass of the Peruvian workers. In the first place, the absolute majority of the working population is employed in companies that are principally pertaining to the CSE. This makes the precarious nature of their employment a structural reality. As they are employed in low productivity companies (micro business undertakings) that do not add much value to national production (Lust 2020, p. 4) and which contribution to total export value is insignificant, there is no real economic sacrifice for the Peruvian State to oblige these businesses to close.²³ Second, companies in the CSE are mainly performing manual and low-skilled labor. This type of labor can only physically be executed at the workplace, or the employer should move some means of production to the residences of these workers in order to continue the productive process. This last option is not to be expected.

The lockdowns urged the mass of the Peruvian workers to look for other sources of income and by ‘breaking’ the lockdowns they might have contributed to the expansion of COVID-19 in Peru. Previously formally employed individuals are forced to look for work in the informal sector. The precarious social and economic situation of the informally employed further aggravated when their informal businesses were forcefully closed.²⁴

The workers who were fired due to the pandemic were formal and informal workers. Formal workers have access to unemployment benefits. However, as these benefits are individualized and based on one’s salary, in general these benefits are not sufficient to maintain one unemployed for more than three months. Because these individuals are forced to look for work, they contribute to the expansion of the virus.

The socioeconomic welfare effects of informality are well-known. Informal workers have no contract, their labor conditions are precarious, and they do not have an unemployment insurance. In addition, most of them are not insured for healthcare. The total and semi-lockdowns caused extremely negative income effects for the large majority of the Peruvian labor force and contributed to the unfolding of a social and healthcare drama.²⁵

The absolute majority of workers in the private sector has a temporary contract (Cuadros Luque 2017, p. 55). Hence, as the companies had to close their doors,

²²An individual who works less than 35 hours a week but wants to work more but cannot find employment, is not adequately employment. When someone works 35 hours a week, but remuneration is less than the established minimum wage level, this person is also not adequately employed. A not adequately employed individual is an underemployed individual.

²³The mining corporations, however, did not have to suspend their activities. As outlined, mining is crucial for economic progress in Peru.

²⁴According to Weller et al. (2020, p. 234), workers with relatively low qualifications, low incomes, and precarious jobs, were the most affected by the sanitary crisis.

²⁵Data of the ILO shows that in months of June to August 2020 the monthly real income of the 3.6 million working individuals in Lima reduced with 10.5%. The average real income in these months was equivalent to the real income in the same months in 2011 (OIT 2020, p. 20).

also these contracts came to an end without any possibility to proceed with a legal claim regarding the loss of income and to demand a certain compensation. This obliged these workers to not only use their unemployment benefits to survive, but also parts of their personalized retirement funds. When their savings run out, they began to look for work, resulting in more people interacting and a resulting expansion of the virus.

The question of temporary contracts or the generalization of labor instability that was introduced during the neoliberal adjustment programs in the 1990s and maintained still then, is not reduced to particular businesses or companies of specific size. Public and private education use temporary contracts as also, for instance, transnational telecommunication businesses and small textile producing companies. However, the use of temporary contracts is not crucial for micro businesses to maintain competitive because normally they do not use any contract at all.

As the big majority of the EAP labors in micro enterprises, it is easy to understand how the financial consequences of COVID-19 for these workers and their families might have given a formidable boost to the expansion of the virus. In Table 1 we present data on the type of contracts of workers in micro companies for the years between 2004 and 2018.²⁶

Table 1. *Type of Contract of Workers in Companies that Employ One to Ten Individuals, Excluding the Own-account Workers: 2004-2018 (As a Percentage of Total Remunerated Workers in Micro Companies, Excluding Own-Account Workers)*

	Permanent contract	Temporary contract	Without contract
2004	1.8%	5.2%	91.5%
2005	1.6%	5.4%	91.6%
2006	1.5%	4.4%	92.6%
2007	1.9%	4.5%	91.8%
2008	1.9%	4.7%	91.3%
2009	1.6%	4.9%	91.9%
2010	1.6%	4.9%	91.9%
2011	1.9%	4.9%	91.3%
2012	2%	5.9%	90.4%
2013	2%	6.7%	89.7%
2014*	17.8%	28.6%	45.2%
2015	2.1%	6.8%	89.7%
2016*	18%	29.6%	45.1%
2017	2.4%	7.7%	88.2%
2018	2.2%	7.8%	88.2%

*We believe that the percentages in these years are incorrect because they radically break with the trend of the entire series.

Source: Household Surveys of Peru, 2004-2018.

²⁶Micro companies are defined as companies that employ between one and ten individuals.

Informality and COVID-19

As argued above, we think that informality or the ‘expulsion’ to the informal sector of previously formally employed individuals has worked as a catalyst for the expansion of COVID-19. As a matter of fact, we believe that there might exist a positive relationship between the rate of informality and the rate of COVID-19 infections. This section pretends to examine this relation.

In Peru, data on informality exists at the level of departments and provinces, but not at district level. Information on the number of COVID-19-infected individuals is available at the level of departments, provinces, and districts. In order to determine the existence of a relation between the rate of informality and the rate of COVID-19 infections, data at the level of departments and provinces is not suitable. For instance, a province might have a relatively low number of COVID-19 infections in comparison with the rest of the country, but in some of its districts it might be extremely high and tightly related to the rate of informality. An analysis at the provincial level does not visualize this possible particularity.

Before we present the evidence that our hypothesis holds, it is important to explain what is meant by the rate of informality at district level. It is not a specific number as there is no data available to calculate it.²⁷ In this article the rate of informality at district level includes the percentage of individuals that labor in companies that employ between one and five individuals and the percentage of self-employed workers.²⁸ In the case the rate of individuals working in companies that employ one to five individuals is higher than the average rate in Metropolitan Lima (55.5%), the rate of informality is considered to be high. The same analytical determination applies to the rate of self-employed workers. The average rate of self-employed workers at the level of Metropolitan Lima is 32.4%. Although it is only necessary that one of the two variables must be higher than the average in order to be counted as a district with high informality, in general a more than average rate of individuals working in very small companies is ‘accompanied’ by a more than average rate of individuals working on their own account. We have considered to include the variable “without health insurance” as an indicator of informality, however as formal and informally employed individuals may contract private health insurance companies, the validity of this variable reduces.²⁹

It is important to underline that this section only intends to find out how a more than average rate of informality is related to a more than average rate of COVID-19-infected individuals. We analyze individuals instead of companies. In

²⁷It should be noted that the yearly published rate of informality at nation-wide level is an estimation. Estimations may differ according to the definition of informality.

²⁸According to the literature, workers who labor in companies that employ between one and five individuals or work on their own account might be considered informal workers (Maloney and Saavedra 2007, pp. 29–30, 39, ILO 2012, Salazar-Xirinachs and Chacaltana 2018, pp. 18, 20, 21).

²⁹Weller et al. (2020, p. 29) use the lack of health insurance of employed individuals as their principal and only indicator to determine labor informality. Although it is not correct to use the question of health insurance as a proxy for formal and informal labor, our data on the percentage of individuals without health insurance according to district show almost full coincidence with the data on individuals who work in companies that employ between one and five individuals and the percentage of own-account workers.

the case an individual works in a very small company in the district of Villa El Salvador (with a high rate of informality) but lives in Pueblo Libre (less than average rate of COVID-19 infections), this individual is counted as working in a company that employs between one and five individuals for the district of Pueblo Libre.

Metropolitan Lima consists of 43 districts. The smallest has 1,090 inhabitants (Santa María del Mar). The biggest is San Juan de Lurigancho with 1,150,470 residents. The differences regarding the number of individuals per district, causes that the relation between the rate of informality and the rate of COVID-19 infections becomes diffuse. For example, the number one district for COVID-19 infections is San Juan de Lurigancho. San Juan de Lurigancho is the most populous district in Lima (1,150,470), however its high rate of informality does not correspond with a high rate of COVID-19 infections. Santa María has above average rates of COVID-19 infections, but not many people live in this district.

These above considerations have led us to conclude that districts such as Ate, Comas, San Juan de Lurigancho, San Martín de Porres have to be excluded from our analysis as the number of their citizens is bigger than the upper limit. This upper limit is determined by dividing the total number of Metropolitan Lima citizens by the number of districts. The average population is 222,787 per district. We consider the lower limit at 1 resident and the upper limit at 445,575 inhabitants.

The rate of informality and the rate of COVID-19 infections demonstrates that a positive relation exists between both variables. Data show that 52.1% of Metropolitan Lima individuals live in districts for which a positive relation exists between the rate of informality and the rate of COVID-19 infections.

The relation between the rate of informality and the rate of COVID-19 infections might be stronger when we take the uneven access to health services into consideration. It is to be expected that individuals working in the informal sector have difficulties to access these services due to financial barriers. As a consequence, the number of COVID-19 infections might be much higher than reported. Furthermore, the precarious financial and labor situation of informally employed individuals might not 'allow' them to report themselves sick due to a COVID-19 infection.

Research on the mortality rate in working class districts appears to be crucial in order to determine if the uneven access to health services of individuals employed in the informal sector is expressed in a more than average rate of COVID-19 mortality. This investigation would increase in importance when it also enables to establish a relation with food habits and the overall health situation in these districts.

Conclusion

COVID-19 is not a democratic virus. Although every human being can be infected, some human beings have more chance to be infected than others. The Peruvian laboring classes in Metropolitan Lima seem easier to be infected by COVID-19 than the accommodating classes, through our demonstration that a

more than average rate of informality is related to a more than average rate of COVID-19 infections.

The lockdowns and the different states of emergency could not prevent the expansion of the virus. When the country started to reopen, COVID-19 got a tremendous boost. The principal function of Peru in the globalized capitalist world has called into existence an economic and a company structure (the big majority of the Peruvian EAP are low-skilled and are employed in micro companies) that have functioned as the structural conditions for the expansion of the virus. The economic development model in place expresses Peru's primary role in the international division of labor as a provider of the raw materials for capitalist development abroad, principally in the advanced capitalist countries and China.

The expansion of COVID-19 is for a major part product of the overall labor precariousness and informality in Peru, the result of the above-mentioned structural conditions for the expansion of the virus. The general use of temporary contracts, the product of the neoliberal adjustment programs in the 1990s, enabled the companies to rapidly reduce personnel and labor costs, but also forced their former workers to put their lives and of others in danger by neglecting social distancing. For these workers the question has been simple: dying from hunger or from COVID-19.

A social and economic structure that contributes to the expansion of COVID-19, a development model that through the elimination of the regulating role of the State and the privatization of its social obligations has converted the country in a permanent social emergency, leading to the incapacity of the government to develop and implement measures against the expansion of COVID-19 in accordance with the country's characteristics, makes discussions over the future design of the social and economic structure of Peruvian society and the role of the State in society more than urgent. These discussions should begin with the current economic development model.

COVID-19 has demonstrated that the prevailing model must change if Peru wants to be prepared for new pandemics. It has shown that Peru has been living in an economic statistical fantasy, where some believed that the country was near of becoming a member of the organization of the most advanced capitalist countries, i.e., the OECD (CEPLAN 2014). However, as recounted here, economic development in the last twenty years has been very thin. Peru is still heavily depended on foreign direct investments in its extractive sector and for the demand for its commodities, the laboring classes are principally performing manual labor, the big majority of the EAP is informal and is employed in very small companies characterized by low productivity, and healthcare is structurally deficient. Without acknowledgement of these factors, it will be difficult to prepare effectively for future pandemics and avoid repeating Peru's experience with COVID-19.

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Topics on Business & Economics

The European Union's Recovery Plan: A Critical Evaluation

Gregory T. Papanikos

This article reviews the European Union's Recovery Plan to cope with COVID-19 by examining two of its main hypotheses. I primarily use Greece as a case study of those who benefit from receiving funds, and in some cases Germany, because it played, and still plays, an instrumental role in promoting this unfounded idea of transferring European taxpayers' money to the hands of national politicians. First, it was alleged that the health situation is improving. Second, the pandemic increases economic divergence between member states. The stylized facts so far do not seem to support either hypothesis. Since the July Summit of the European Council, the epidemiological situation has worsened as measured by deaths and cases. Data on per capita Gross Domestic Product released by the European Commission on 6 May 2020 show an unprecedented for peace years decline in economic growth rates for all 27 member states in 2020. The data estimations also assume a V-shaped recovery for 2021. However, the alleged hypothesis of economic divergence in 2020 and economic convergence in 2021 is not supported by the data themselves. The main conclusion of this study is that the economic impact cannot be fully ascertained if the pandemic is not permanently over and therefore the titanic EU spending of 750 billion euro cannot be based on the stylized economic and epidemiological facts.

Keywords: *European Union, pandemic, COVID-19, health, growth, public spending, recovery plan, Germany, Greece*

Introduction

It took God six days to create the heavens and the Earth. This is one day more than the days it took the 27 European Union (EU) Heads of States to create a Recovery or Rescue Plan (RP) from 17 to 21 July 2020. The genesis of the RP is another of those EU (economic) miracles by which the incomes of the future generations of European citizens are taxed to serve the interests of current day politicians¹.

As a great supporter of representative democracy and the European Union project, I must declare from the outset that I consider these allocations (read misuse) of funds as the necessary cost to maintain (representative) democracy in Europe. It is obvious that I consider these a waste of money, but if their opportunity cost is to

¹After writing this paper, I read a publication (Diamond 2020) which generalized this policy of using tax-payers money to serve the interest of politicians in power and made a persuasive argument that not only money is wasted but the democratic process itself is undermined by authoritarian regimes around the world not excluding the EU countries. These regimes which were elected by "democratic" processes but used the pandemic to suppress freedom of press and independence of the judicial.

avoid another world war, then it makes perfect political rational sense. After all, whenever the EU leaders have difficulties in explaining the rationality of increasing their budget, they use the argument of all arguments: the EU was formed to avoid another world war. Who can oppose to that? Thus, the EU RP aimed, "...to prevent a north-south split" as *Financial Times* put it at the aftermath of the July EU decision². Another "war" was successfully avoided; the President of the European Council himself was inspired in his youth years by this ideal as proudly posts it³.

With this in mind, I must state that my criticism is not against the RP but to emphasize once again the glory of representative democracy. European people elect the leaders they really deserve who are a mirror-image of the people whom they represent. Thus, there is no surprise that their conclusion of sixty-eight pages of the RP is full of (economic) nonsense but full of rational political realism, i.e., political leaders of the EU member states increase their probability of being re-elected in the next national election⁴. Definitely their popularity is a nondecreasing function of the billions of euro allocated to their country. For example, in Greece the government and its political clientele are already bickering about how to "waste" these unexpected external funding which will increase the probability of the current government to be re-elected. Pandemic was an unexpected "dowry" for them because they do not have to apologize for their ridiculous economic plan that first was presented in 2016 by then leader of the Official Opposition Party and now Prime Minister. I have commented on that program revealing not only the lack of basic scientific support of their economic arguments but their inherent contradictions⁵.

Similarly, the purpose of this article is to show the inexistence of any scientific support of the economic part of the RP. This did not come as a surprise to me because representing Greece in one of the five institutions of EU for fourteen years, I had a firsthand experience to test the economic theories that underline this paper. I primarily use Greece as a case study of those who benefit from receiving funds, and in some cases Germany, because it played, and still plays, an instrumental role in promoting this unfounded idea of transferring European taxpayers' money to the hands of national politicians. The other 25 countries are split between two groups: those who give and those which receive - and this makes perfect political sense. Public spending and a greater economic role of the state is not something to be condemned as I have explained in my early articles on the theory and practice

²See <https://www.ft.com/content/1fd5785b-5f6f-4175-bae4-214b43a55804>.

³In his biography (<https://www.consilium.europa.eu/en/european-council/president/biography/>) the second sentence -after his birthyear and birthplace mentioned which- states the following: "He grew up listening to the stories of his parents and grandparents, who had experienced the devastation of the Second World War and knew **how precious peace and reconciliation are**. Today he says: '**I have never taken these for granted**'" (bold in the original).

⁴A reviewer pointed out that this might not be the case with Germany. Of course, the current Chancellor of Germany may not run again for another term but her party will. Thus, the question is whether the RP will benefit her party. As I explain below there are more than COVID-19 in the RP.

⁵See Papanikos (2016). In that program they aimed to increase private investments to 100 billion euro in the next five years in one chapter of their program and in another that their target growth rate was about 4%. With an annual increase of 20 billion euro in private investment, simple national accounting arithmetic would have shown that the rate of growth would have been more than 10% per year.

of public expenditures (see Papanikos 1991, 1990). But public spending should be efficient, effective, democratic (transparent), and externally competitive. I use these terms as they are defined at the textbook level of analysis. I have yet to see an overall project by project multiplier analysis of all EU initiated mammoth public investments or private investments supported by EU using these criteria. A technical report published by the European Commission in 2016 simply recognizes this inability of evaluating investment projects using multiplier analyses.

This paper is organized into six sections including this brief introduction. The next section presents the Recovery Plan, or as sometimes called, the Rescue Plan. The latter represents better the current situation if the sentence is understood to mean that future generations will be taxed to rescue the current generations of politicians in EU. The following section discusses the health impacts of the pandemic as these are measured by the death rate and the number of people infected in EU as whole and per member states. The high variations between member states are ignored by the EU's conclusions of their July summit. In section four of this article evidence is presented to support the EU's hypothesis that the pandemic has led to economic divergence in 2020 using the data released by Economic Commission. The relationship between economic growth and the health impact is examined in section five. Conclusions are given in section six.

The Rescue Package

According to the conclusions of the European Council, the European Commission will borrow from the capital markets the amount of EUR 750 billion in 2018 prices to be allocated to member states as loans (360 billion) and grants (390 billion) to cope with the current pandemic⁶. The borrowing will end in 2026. Loans will be repaid by the end of 2058 at the latest. In addition, 1,074.3 billion euro will be spent as part of EU's budget, making the total spending 1,824.3 billion for the 2021-2027 period.

As is usual the case in the EU jargon, they invented new names for these two public expenditures: the first is called Next Generation EU (NGEU) and the latter Multiannual Financial Framework (MFF). The European Council's conclusions justify these expenditures as follows:

The COVID-19 crisis presents Europe with a challenge of historic proportions. The EU and its Member States have had to adopt emergency measures to preserve the health of the citizens and prevent a collapse of the economy. We are slowly exiting the acute health crisis. While utmost vigilance is still required on the sanitary situation, the emphasis is now shifting to mitigating the socio-economic damage. This requires an unprecedented effort and an innovative approach, fostering convergence, resilience and transformation in the European Union. At the request of the Heads of State or Government, the Commission presented at the end of May a very wide-ranging package combining the future Multiannual Financial Framework (MFF) and a specific Recovery effort under Next Generation EU (NGEU)" (European Council 2020).

⁶See <https://www.consilium.europa.eu/media/45109/210720-euco-final-conclusions-en.pdf>.

The Heads of States took for granted two issues which in the scientific jargon can be called testable hypotheses. First, the EU countries, "... are slowly exiting the acute health crisis". Is this the case? What does the evidence show after the July EU meeting? Second, EU expenditures aim at preventing the collapse of the economy by "mitigating the socio-economic damage" which can be achieved by "fostering convergence."

It is not clear what is meant by "convergence" but for all intents and purposes in this paper I interpret it to mean that if the pandemic were left without any EU policy reaction it would have resulted to an unprecedented economic collapse (an obvious observation when the economy is locked down) which will cause an economic divergence between the economies of the member states. This is the causality assumed by the EU document. This assumes that the poor countries of the EU have been hit harder by COVID-19. Why would that be the case? Is this the case? The European Council (2020) document does not answer these two questions and takes for granted that the pandemic has caused an economic divergence.

The two hypotheses are examined here using the available data on the health and economic impact of the pandemic. Health data are available on a daily basis on the number of people infected and died from the disease by country. The number of deaths is arguably a more reliable indicator than cases (i.e., the number of people infected). However, the costs of cases may be different from the ones incurred by deaths, which as an issue is not discussed here. On the other hand, on the 6 of May 2020 the European Commission had estimated that the economic cost of the pandemic which is alleged to be close to one trillion in 2015 prices from EUR 13.3 trillion in 2019 to 12.3 trillion in 2020. The average decline of GDP was estimated to be 7.4%. Also, the estimates of the 2021 data show a V-shaped recovery.

I should make a comment here because many foolishly compare the economic impact of the pandemic in Europe to the economic impact of the Second World War. This is pure economic nonsense for at least two reasons. The Second World War was characterized by a huge destruction of the stock of capital. This is not the case of COVID-19. If nothing else, COVID-19 will increase the stock of capital, both private and public, because the EU spending will be allocated to huge public investment projects throughout the member states, and unless this funding does not crowd out private investments as is the most probable scenario, an overall increase in capital stock is expected. Second, during the Second World War a high proportion of the youth of Europe was killed in the battlefields, decreasing the number of productive workers who would have been available to be used after the war. It might sound cynical, but the COVID-19 economic impact might be positive because it affects disproportionately more the older age group who are no longer productive and they absorb a high amount of public social and health spending. This of course applies only to deaths and not to cases. In a recent study, Mallapaty (2020) concluded that "For every 1,000 people infected with the coronavirus who are under the age of 50, almost none will die. For people in their fifties and early sixties, about five will die — more men than women. The risk then climbs steeply as the years accrue. For every 1,000 people in their mid-seventies or older who are infected, around 116 will die. These are the stark

statistics obtained by some of the first detailed studies into the mortality risk for COVID-19.” Why would someone who is under 50 pay the high price of a negative growth rate? Or as Reimers and Schleicher (2020) from OECD have pointed out emphasizing the effect of lock down on education and the effect of this on long run growth and youth unemployment, how do policy makers weight these losses? Some policy recommendations have been proposed by García and Weiss (2020).

The aggregate reduction of the growth rate in 2020 hardly constitutes an economic collapse⁷. The EU itself assumes that in 2021 the growth rate of EU will rebound, creating a V-shape type of recovery. This will be achieved with the help of the RP. Member states must prepare their own national plans for the period 2021-2023 which will be approved by the end of this year by the European Commission and then revaluated in 2022. This is the normal notorious bureaucratic procedure of the EU which results in delays and non-absorption. This way, the funding usually comes late and is less than what was originally planned. Both are detrimental to the economic targets adopted by the program but it serves well the goals of national politicians who always blame the Brussels bureaucracy if the absorption does not go relatively well and they want to get all the credit if the absorption goes as planned or even better. In Greece, all structural funds have been delayed and extension was given for increasing the rate of absorption. The alternative where the European Commission itself undertook the design of plans is anathema to national governments because it does not serve their political objectives of “buying votes” for their next national elections.

The European Council (2020) document does not make any reference to the efficient use of the 1.8 trillion euro. But if we assume that 1.8 trillion euro will be spent in the next seven years to make up for the one trillion loss during the pandemic then the multiplier effect of these large public investment projects is less than one, and I guess for some countries like Greece most probably will be negative, i.e., the bad EU public investment funds will crowd out disproportionately good private investments. Of course, these multiplier effects must be larger if one compares the loss not in terms of 2019, but with what would have been the GDP of 2020 if there was no pandemic. A positive growth rate was expected. Unfortunately, the European Council (2020) document does not provide a discussion of these important issues. It seems to me that the efficient and effective use of European taxpayers' money, especially those taxes which are to be paid by the future generations, was never of great concern and therefore an important priority of the EU leaders.

The Asymmetry of the Health Impact

Plagues might have severe impacts on the death rate of population. The first well-known plague was the one which struck ancient Athens from 430 to 427 BCE. Thucydides provided an excellent depiction of the plague in his masterpiece of the history of the *Peloponnesian War* (see Papanikos 2021) which included

⁷This is true for the overall economy but some sectors like the tourism sector in Greece has experienced an almost total collapse as I have demonstrated in Papanikos (2020d).

health and social impact. It is really amazing the similarities of the ancient plague and the COVID-19. The striking conclusion when the two are compared is that contrary to Thucydides' wish and hope, the human race does not learn from its previous historical mistakes and keeps on repeating them. The current pandemic is not an exception as well as previous ones that we have information for and mentioned in the literature previously cited.

I have examined elsewhere the severity of COVID-19 in the 27 EU countries (Papanikos 2020a); not repeated here. This section updates the findings of that paper and adds overall daily data to examine the claim by the European Council's conclusions that EU is, "...exiting the health crisis." This was not examined in my previous study. I start with examining this claim first and then I proceed with the asymmetry hypothesis, i.e., the pandemic's health impact varies considerably between the EU member states.

Table 1 provides descriptive statistics of daily reported deaths and cases in EU countries until the end of August 2020. During this period the average daily death rate was 632 people and the average number of people infected was 8,295. The standard deviation was 932 for the death rate and 8,003 for the number of people infected. In total so far in the EU countries 139,679 people have died from COVID-19 (0.031% of EU population) and 1,833,125 people have contracted the virus (0.409% of total EU population).

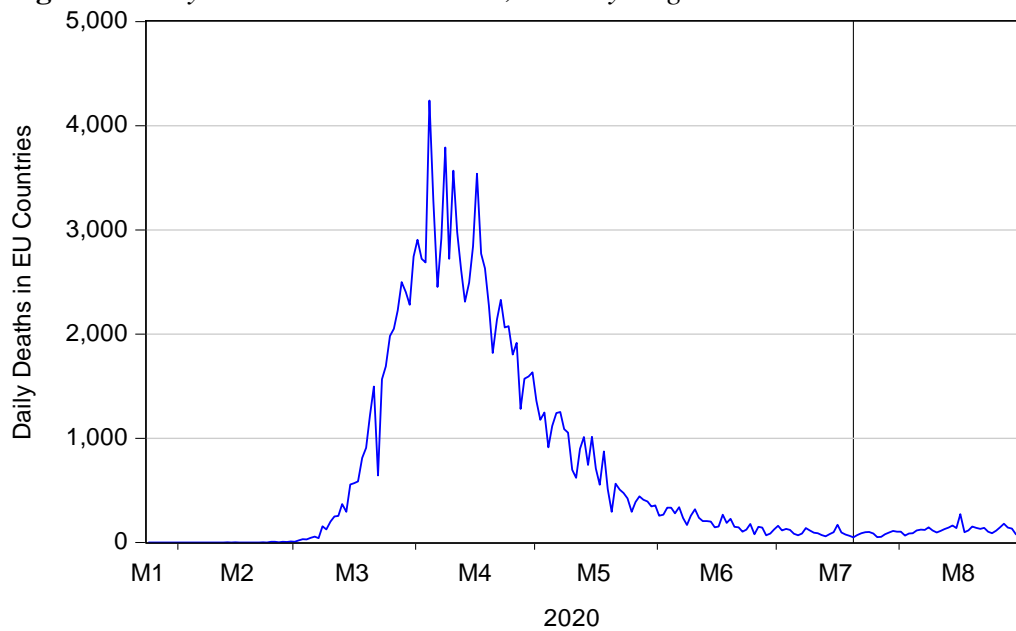
Table 1. *Descriptive Statistics of Daily Deaths and Cases in EU, January-August 2020*

	Deaths	Cases
Mean	632	8295
Median	149	5252
Maximum	4242	32963
Minimum	0	0
Std. Dev.	932	8033
Skewness	1.73	1.16
Kurtosis	5.03	3.50
Jarque-Bera	148	52
Probability	0	0
Sum	139679	1833125
Observations	221	221

Source: World Health Organization. Retrieved from: https://COVID-19.who.int/?gclid=EAIaIQobChMIuISnjIT76gIVGODtCh1XfQAsEAAYASABEgJK8_D_BwE.

The daily number of deaths is depicted in Figure 1. The first cases in EU arrived in February, it peaked in March, and started to decline since April and May until the EU Council Meeting of 17-20 July of 2020. Thus, the evidence that the EU leaders had at hand justified their claim that the EU was exiting the health crisis. However, that was conditional of the economy being locked down. If there is a negative relation between the health impact and the degree to which the economic activity is restricted (locked down), then one may expect an increase in the number of deaths and the number of people infected once the restrictions on economic activities are lifted.

Figure 1. *Daily Deaths in EU Countries, January-August 2020*

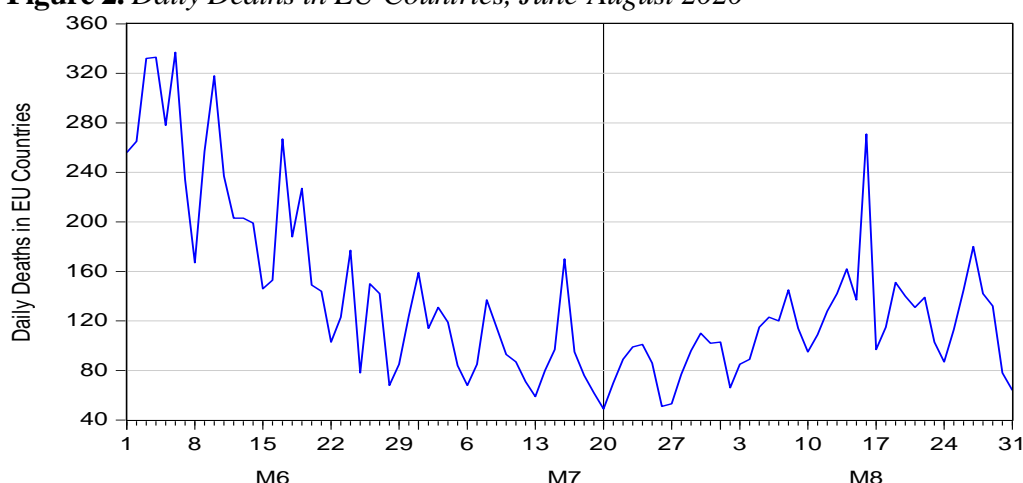


Once the first restrictive measures were lifted, the deaths (and cases which are not reported) started to increase again and this is worrisome for the economy. It implies that opening up the economy will occur at the cost of higher death and case rates. This is shown in Figure 2. The vertical line indicates the date 20 July 2020 which is the date that the summit of EU concluded. By coincidence, on that date the number of deaths was at its minimum after its peak in March-April 2020.

It seems that the pandemic tends to persist despite all of economic and social measures which all EU countries without exception have implemented. The fact that there is an increase in the number of deaths in August 2020 is not a good economic signal for the health impact because it might be related to the slow opening up of the national and international economies especially of the hospitality and travel industries.

I have examined elsewhere the demographics and the health expenditures aspects of the COVID-19 impact in EU countries (see Papanikos 2020b, 2020c). What emerges from these studies is that the health impact varies considerably between the EU member states. A scientific explanation is needed before an economic policy to cope with the pandemic is properly designed and implemented. Such economic policy is based on facts available is missing. Spending tax payer money will not scare away the pandemic; it will simply add to the public deficits and accumulated public debt.

Figure 2. Daily Deaths in EU Countries, June-August 2020



Another issue not mentioned in the conclusions of the EU summit is the large variations in the death rates between the EU countries. Updated data per EU member state to include the August 2020 figures are reported in Table 2. The average death rate (total deaths per million of population) was 194 people and the standard deviation 231 people. The lowest number was observed in Slovakia of six deaths per million people and the highest in Belgium of 857 per million people. What is also of importance is that these variations are independent of the (a) population, (b) geography, (c) size of the country, and (d) per capita GDP. How can one explain the huge difference between France and Germany? France’s death rate was four times higher than the Germany’s death rate. These variations are ignored by the EU document and my reading of it suggests that the health impact of the pandemic was symmetric.

Table 2. Deaths per Million of Population, January-August 2020

Country	Deaths per Million	Country	Deaths per Million
Belgium	857	Lithuania	31
Bulgaria	88	Luxembourg	196
Czechia	40	Hungary	63
Denmark	107	Malta	21
Germany	112	Netherlands	356
Estonia	48	Austria	82
Ireland	359	Poland	53
Greece	25	Portugal	177
Spain	615	Romania	185
France	453	Slovenia	61
Croatia	45	Slovakia	6
Italy	588	Finland	61
Cyprus	24	Sweden	561
Latvia	18		
Mean	194	Minimum	6
Standard Deviation	231	Maximum	857

This is an important issue; however, it is not analyzed in this paper. One may assume that this is due to policy differences and more specifically, to the timing and the extensiveness of lockdown measures. This might provide an explanation of the severity of the pandemic and the loss of GDP.

Restrictive economic measures such as, a complete lockdown (e.g., closing hotels and banning international travel) decreases the number of deaths and cases, but it also reduces considerably the GDP growth. At some point in the near future, and if the vaccine for COVID-19 is not found soon, then a political decision must be taken between the tradeoff of an open economy and deaths from COVID-19.

This tradeoff was completely ignored in the EU conclusions of the RP which is the focus of this article. Just food for thought: if the growth rate is also related to death rates both in the short and the long run, how then does a policy of locking down the economy completely affect the death rate due to negative economic growth? If these data were available, then policy makers could tradeoff these deaths with the deaths of the COVID-19 when the economy operates without restrictions. This might sound harsh but this is exactly what policy makers are doing. Realizing it or not is not important. It seems that in some countries of the EU the public (especially the youth) does not support anymore the lock down. As mentioned, the risk of coronavirus is zero for the age group under fifty.

Economic Convergence during the Pandemic

How does a pandemic affect the economy or a group of economies such the EU member states? There is no answer to this question. The economic literature on pandemics is relatively large but no consensus has been reached; studies include among many others the publications of Almond (2006), Bandiera et al. (2018), Barro et al. (2020), Burns et al. (2018), Correia et al. (2020), Eichenbaum et al. (2020), Fan et al. (2018), and Jonas (2013). This literature makes a distinction between short- and long-term effects finding both negative and positive economic effects. It also distinguishes between early and late reactions of governmental policy makers to cope with the pandemic. A brief discussion of this literature is given in my previous paper already mentioned (Papanikos 2020a).

However, I was not able to find anything in this literature which can justify the claim that a pandemic may cause an economic divergence between a group of countries, which for all intents and purposes, belong to a group of relatively affluent countries of the world. Thus, from a theoretical and empirical point of view, EU's claim that the COVID-19 has caused an economic divergence is unfounded. Thus, the justification of spending taxpayers' money, especially of the money of the future generations, is neither based on theory nor on empirical evidence. One may envisage that a relatively poor country may suffer more from a pandemic due to lack of health infrastructure and relatively less government spending on health-related services and infrastructure. Even though, Papanikos (2020c) has found a positive association between GDP and health-related public spending in the EU countries. Higher health spending was not related to COVID-19 impact. Overall public health expenditures are not associated with the death rates of the member

states. However, other factors may explain why this is the case such as the age structure of population.

Despite all the evidence, one of the aims of EU's RP is to mitigate the economic effect of the pandemic by promoting economic convergence. However, the document of the conclusions does not define what is meant by convergence. I assume here that what the leaders of the EU wanted to say is that the pandemic led to economic divergence which the EU extraordinarily expenditures aimed at mending. Thus, the question to be answered is whether the pandemic resulted to economic divergence. Is this the case? No evidence was provided in the document of the conclusions and this is what I want to emphasize in this study. In other words, the leaders of the EU decided to spend additional EUR 750 billion to solve a problem that they did not know existed. This huge amount of taxpayers' money will never solve a problem that most probably does not exist.

The problem is not fall of GDP which is expected with certainty when the EU countries locked down their economies -this says nothing about the economic divergence of the EU member states. However, the EU leaders did have in front of them all of the data to estimate whether in the year 2020 economic divergence occurred and with some heroic assumptions then they could claim that this was due to pandemic. For example, if the poorest countries of EU depend proportionally more on tourism and international travel is banned, then economic divergence is to be expected. However, in this case what is needed is opening up the borders so that tourists can travel. Spending more money will not do it. Finding a vaccine for COVID-19 will suffice.

The European Commission released estimates of the GDP on the 6 May 2020 for 2020 and 2021. These projections included the expected impact of the pandemic. Table 3 shows the rate of growth of real GDP in the current decade of 2010s. Overall the rate of growth of GDP in 2020 is expected to decrease by 7.4%; historically an unprecedented rate but it is also expected to bounce back in 2021 with an increase of 6.1%.

For the purposes of this article, what is of interest is the divergence of economic growth rates as these have been estimated by the official statistical agency of EU (Eurostat) and not the growth rates themselves. From the 27 countries, Greece is expected to be hit the hardest with a sharp GDP decrease of 9.7%. On the other hand, Poland will register the lowest drop in GDP of 4.3%. These huge differences are left unexplained in the EU document.

Table 3. GDP Growth in EU Countries, 2011-2021

Country	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
European Union	0.061	-0.074	0.015	0.021	0.027	0.021	0.023	0.016	-0.001	-0.007	0.018
Belgium	0.067	-0.072	0.014	0.015	0.020	0.015	0.020	0.016	0.005	0.007	0.017
Bulgaria	0.060	-0.072	0.034	0.031	0.035	0.038	0.040	0.019	0.003	0.004	0.024
Czechia	0.050	-0.062	0.026	0.028	0.044	0.025	0.053	0.027	-0.005	-0.008	0.018
Denmark	0.051	-0.059	0.024	0.024	0.020	0.032	0.023	0.016	0.009	0.002	0.013
Germany	0.059	-0.065	0.006	0.015	0.025	0.022	0.017	0.022	0.004	0.004	0.039
Estonia	0.059	-0.069	0.043	0.048	0.057	0.026	0.018	0.030	0.013	0.031	0.074
Ireland	0.061	-0.079	0.055	0.082	0.081	0.037	0.252	0.086	0.014	0.002	0.003
Greece	0.079	-0.097	0.019	0.019	0.015	-0.002	-0.004	0.007	-0.032	-0.073	-0.091
Spain	0.070	-0.094	0.020	0.024	0.029	0.030	0.038	0.014	-0.014	-0.030	-0.008
France	0.074	-0.082	0.013	0.017	0.023	0.011	0.011	0.010	0.006	0.003	0.022
Croatia	0.075	-0.091	0.029	0.027	0.031	0.035	0.024	-0.001	-0.005	-0.022	-0.003
Italy	0.065	-0.095	0.003	0.008	0.017	0.013	0.008	0.000	-0.018	-0.030	0.007
Cyprus	0.061	-0.074	0.032	0.041	0.044	0.067	0.034	-0.019	-0.066	-0.034	0.004
Latvia	0.064	-0.070	0.022	0.043	0.038	0.018	0.033	0.019	0.023	0.041	0.063
Lithuania	0.074	-0.079	0.039	0.036	0.042	0.026	0.020	0.035	0.036	0.038	0.060
Luxembourg	0.057	-0.054	0.023	0.031	0.018	0.046	0.043	0.043	0.037	-0.004	0.025
Hungary	0.060	-0.070	0.049	0.051	0.043	0.022	0.038	0.042	0.020	-0.015	0.018
Malta	0.060	-0.058	0.044	0.073	0.065	0.058	0.109	0.088	0.048	0.028	0.014
Netherlands	0.050	-0.068	0.018	0.026	0.029	0.022	0.020	0.014	-0.001	-0.010	0.016
Austria	0.050	-0.055	0.016	0.024	0.025	0.021	0.010	0.007	0.000	0.007	0.029
Poland	0.041	-0.043	0.041	0.053	0.049	0.031	0.038	0.033	0.014	0.016	0.050
Portugal	0.058	-0.068	0.022	0.026	0.035	0.020	0.018	0.008	-0.009	-0.041	-0.017
Romania	0.042	-0.060	0.041	0.044	0.071	0.048	0.039	0.034	0.035	0.021	0.020
Slovenia	0.067	-0.070	0.024	0.041	0.048	0.031	0.022	0.028	-0.010	-0.026	0.009
Slovakia	0.066	-0.067	0.023	0.040	0.030	0.021	0.048	0.028	0.007	0.019	0.029
Finland	0.037	-0.063	0.010	0.016	0.031	0.027	0.005	-0.004	-0.009	-0.014	0.025
Sweden	0.043	-0.061	0.012	0.022	0.024	0.024	0.044	0.027	0.011	-0.006	0.031
Standard Deviation	0.01316	0.01334	0.01706	0.01669	0.01420	0.04681	0.02289	0.02256	0.02554	0.02981	0.02724

Source: European Commission (AMECO). [Accessed 22 August 2020], and author's calculations.

In this paper I only present some stylized facts. Further (econometric) analysis is required which goes beyond the scope of this paper. What is important is whether the pandemic led to a divergence in the rates of growths of the EU countries. The last row of Table 3 shows that this was not the case. The standard deviation of the GDP growth rates of the 27 EU members states is lower in 2020 than in 2019. It seems that as far as the rates of growth of GDP are concerned the EU countries are not expected to have an economic divergence. If anything, they are expected to have a convergence of the rates of growth of GDP.

Economic convergence is usually measured using per capita income, or alternatively a measure of labor productivity or total factor productivity. The purpose here is not to provide a detailed analysis of the issue of economic convergence, but to shed some light on the darkness of the EU conclusions of the RP which provided no evidence for the alleged problem which their policies are to supposedly mend. On the methodology of economic convergence applied to the Greek regional economic convergence see Michelis et al. (2004).

To keep it as simple as possible, I follow Lichtenberg (1994) and assume that the convergence hypothesis can be expressed as the ratio of the log of the variances of per capita GDP in 2019 and 2020:

$$\text{Convergence} = [\text{Var} (\text{LnGDPPOP}_{2019})] / [\text{Var} (\text{LnGDPPOP}_{2020})] > 1$$

An F-test of the above ratio will demonstrate whether economic convergence is statistically significant. Table 4 presents the per capita GDP of the 27 EU member states using the annual averages of exchange rates for the countries of the EU that are not members of the eurozone. There are large differences in per capita income as these are shown by the standard deviations of GDP per capita. However, what is of interest here is whether this standard deviation has increased or decreased due to the pandemic.

The last row of Table 4 reports the standard deviations of per capita GDP of the EU countries. Before the pandemic there was an upward trend in the standard deviation providing some evidence of non-convergence. In 2020 the standard deviation from 19,598 euro in 2019 decreased to 18,232 euro in 2020 and it is expected to increase to 18,934 in 2021. According to the numbers reported by the European Commission, the effect of the RP will increase the standard deviation of per capita GDP between the 27-Euro countries. If nothing else, the pandemic seems to promote convergence.

Testing for convergence is testing for differences in the variance of the logarithms of per capita income between two different time periods. Table 5 presents descriptive statistics of the logarithms of the per capita GDP for 2019, 2020 and 2021. The values of interest are the ratios of variances of 2019, 2020 and 2021. If this ratio is greater than one then the convergence hypothesis cannot be rejected. This ratio for the 2019-2020 period is 0.9859 and for the 2020-2021 years is 1.0168. An F-test shows that the ratio of the variances is not statistically different from one. Thus, the stylized facts show neither divergence nor convergence in 2020.

Table 4. Per Capita GDP in the EU Countries, 2011-2021

Country-GDPPPOP	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
European Union	29033	27405	29642	29249	28684	27969	27465	26892	26513	26566	26812
Belgium	37876	35680	38625	38295	37917	37331	36961	36435	36029	36033	35992
Bulgaria	7472	6995	7480	7202	6936	6652	6363	6080	5933	5882	5827
Czechia	17575	16999	18923	18541	17625	16485	15980	15058	15559	16154	16674
Denmark	50804	48527	51756	50866	50008	49292	48050	47299	46774	46613	46640
Germany	38470	36400	38995	38869	38400	37616	37094	36776	36126	36070	35987
Estonia	18242	17270	18609	17913	17144	16209	15824	15508	15008	14753	14258
Ireland	65814	62509	68287	65582	61366	57381	55972	45136	41870	41515	41592
Greece	17144	15801	17409	17056	16698	16418	16381	16345	16117	16537	17743
Spain	24393	22917	25315	25021	24550	23902	23219	22340	21969	22207	22899
France	34228	31956	34921	34366	33890	33257	33019	32788	32635	32616	32674
Croatia	12165	11338	12693	12269	11762	11184	10603	10254	10296	10395	10716
Italy	27546	25840	28547	28422	28160	27657	27257	27021	27086	27734	28719
Cyprus	23275	22184	24231	23751	23105	22347	21031	20229	20387	21766	22889
Latvia	14353	13398	14371	13968	13291	12688	12353	11861	11553	11242	10528
Lithuania	15302	14186	15389	14762	14107	13345	12848	12474	11948	11421	10853
Luxembourg	90708	87469	94071	93876	92848	93211	91440	89403	87763	86872	89205
Hungary	11697	11128	12867	12503	12255	11631	11400	10998	10946	10988	11487
Malta	22808	22171	24246	23993	23156	22361	21620	19971	18737	18128	17796
Netherlands	42079	40399	43700	43205	42359	41405	40732	40127	39708	39876	40441
Austria	41491	39699	42217	41737	40948	40211	39894	39889	39939	40170	40078
Poland	12228	11880	12948	12530	11904	11066	11189	10766	10383	10263	10260
Portugal	19107	18057	19363	18940	18424	17756	17350	16974	16750	16814	17454
Romania	9191	8782	9438	9218	8936	8439	8087	7751	7510	7164	7351
Slovenia	21175	19891	21448	21106	20332	19406	18830	18437	17960	18171	18699
Slovakia	16254	15259	16376	16033	15433	14998	14709	14042	13680	13606	13373
Finland	40292	38907	41604	41241	40639	39509	38570	38488	38796	39330	40078
Sweden	39592	38481	42363	43637	45979	46304	46349	46116	47672	47274	46198
Standard Deviation	18934	18232	19598	19474	19219	19145	18856	18154	17931	17820	18090

Source: European Commission (AMECO). [Accessed 22 August 2020], and author's calculations.

Table 5. *Descriptive Statistics of the Logarithms of Per Capita GDP*

	LOG(GDPPPOP19)	LOG(GDPPPOP20)	LOG(GDPPPOP21)
Mean	10.108	10.023	10.076
Median	10.095	10.007	10.035
Maximum	11.452	11.379	11.415
Minimum	8.920	8.853	8.919
Range	2.532	2.526	2.496
Std. Dev.	0.613	0.617	0.612
Variance	0.376	0.381	0.375
Skewness	0.178	0.194	0.184
Kurtosis	2.454	2.415	2.416
Jarque-Bera	0.478	0.555	0.536
Probability	0.787	0.758	0.765

Source: Author's calculations.

Thus, the conclusion which emerges from the above brief analysis of the statistical data provided by the European Commission is that the pandemic did not affect the convergence of the economies of the 27 EU member countries. The aim of the RP to mend a gap that was never opened makes no sense and the 2021 data show that the planned expenditures will not affect the convergence. However, according to the estimates of EU, these expenditures are expected to have a large effect on economic growth of EU's GDP as is shown in Table 3.

The Economic and Health Impact of the Pandemic Compared

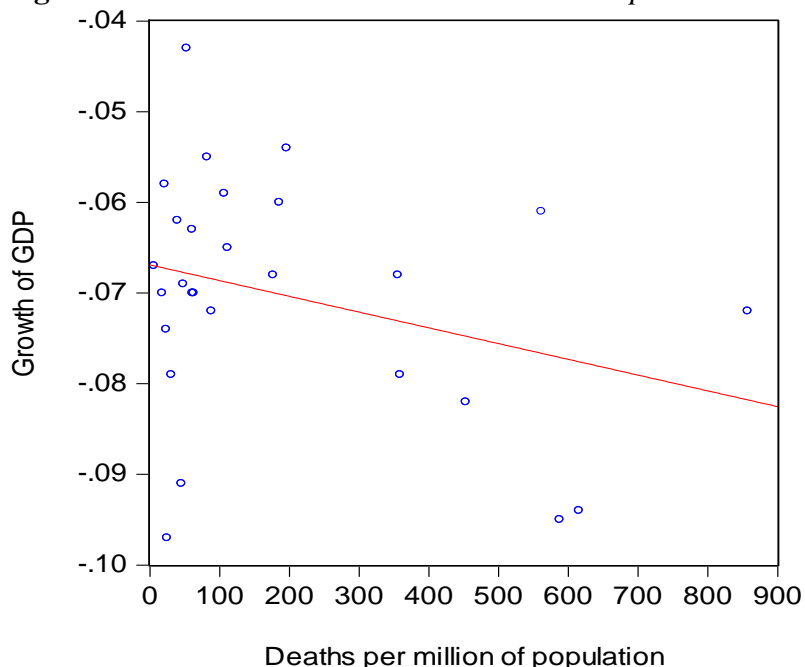
How can one explain the high variations in the growth rates of 2020 as these are reported by the European Commission?¹ One possible explanation is that the high variation of the COVID-19 impact on death rates and the number of people infected had a diverse impact on economic growth. It was shown above that COVID-19 had an asymmetric health effect in the EU countries.

The process is important here. Unfortunately, the EU idea of a common action to face a common problem did work out as one would have expected. On the contrary, COVID-19 revealed once again that there is no such thing as a common European policy. Each country of the EU implemented its own policies to cope with the COVID-19 impact at different time periods. This is not an argument in favor of a common policy but to emphasize the contradiction between the EU summit which aimed at coordinating a common policy and the practice of each country or each region within each country. In Germany, Italy and Greece policies were determined at subnational level as well. On the other hand, EU common policies to fight the pandemic may not be sufficient because this is a global phenomenon and should be dealt with international collaboration. Institutions such as the World Health Organization (WHO) and World Trade

¹I have examined in Papanikos (2015) the growth rates differences between the EU member states. As argued there the reason was the misalignment of the real effective exchange rate which benefited Germany and harmed the Greek economy.

Organization (WTO) have failed to play a leading role either because their role have been undermined as suggested by Goldin (2020) but it might be the result of their own incapacity in dealing with world crises.

Figure 3. *Growth and Death Rates in the EU Compared*



The most important of all was the timing of shutting down economic activity - the argument goes as follows. Countries which locked down their economies earlier had lower death rates than countries which reacted late when the disease had already spread to society at large. The cost paid by those countries which locked down their economies earlier than others would have had a higher loss of output. On the other hand, those which locked their economies late would have gained in output growth but they would have lost in terms of death rates. One, then, should expect a positive relation between growth rates and death rates. Higher growth rates relative to other countries in the EU were obtained at the cost of higher death rates.

Figure 3 is a scatter diagram between the growth and death rates of the 27 EU member states. Contrary to what was stated above, the relationship is negative and is shown by the linear regression line. Higher growth rates are associated with lower death rates, but the dispersion is so high that no reliable conclusion can be drawn.

It seems that the process by which the COVID-19 affects the economies of EU countries is not the same. Great variations exist which need further study at the individual country or even regional level. If the process is different, then the policy design should be tailored to the needs of each country or region. This may require more than spending EU money.

Conclusions

This paper examined two claims made by the EU's summit in July 2020 to justify a spree of public spending to be financed by the future generations of Europe's taxpayers. These mass spending serves the needs of the current politicians of the governments of the member states which is supported by anecdotal evidence from Greece and Italy but a future research may look at this relationship more carefully. The first claim made in the document at the conclusion of the July meeting was that the EU is slowly exiting the pandemic. This was true at the time the decision was taken (20 July 2020). This was conditional on the severe measures taken to stop the spread of the disease which included a complete lockdown of the economies. Once these measures were lifted the number of deaths and cases started to rise again.

The second claim made by EU leaders is that the economic impact of the pandemic was not only a sharp decrease in the rate of growth of GDP but an increase in the economic divergence of the member states economies. Based on the estimates of GDP declines made by EU itself, the empirical evidence does not support their claim of economic divergence in 2020 and economic convergence of 2021.

The economic irrationality of EU spending in terms of the growth impacts can only be explained if the rationality of political decision making is taken into consideration. The COVID-19 health and economic impact is used as an excuse for the national governments to spend more to increase their probability of being re-elected in the next national elections. This is true for the countries which will receive the money (e.g., Greece) but even the donors (e.g., Germany) may benefit if what was at stake was the political integrity of EU itself.

From this point of view, the RP plan is a good excuse to rescue national politicians of the EU member states. This is a subject of future research as data on the probability of being reelected at the national level become available. Some public opinion polls do suggest this is definitely the case for Greece and Italy which are both great waste outlets of EU taxpayers' money.

It is true that in Germany the RP is not very popular and this is understandable. However, as explained by a *Policy Brief* of the European Council of Foreign Affairs prepared by Puglierin and Franke (2020), the RP might be a prelude to a wider geopolitical collaboration between Germany and France in fostering a common foreign and security policy. As they put it "On 1 July, Germany took on the presidency of the Council of the EU. Some observers have labelled it as the most important presidency in the EU's history, a make-or-break moment." And a few lines below "If there was a beauty contest for EU coalition-building, Germany would be its winner." Based on survey data of all 27 EU members, Germany is considered the most important and reliable member state which can be trusted to reach a consensus at the EU level. As Puglierin and Franke (2020) state, "The survey shows that, in almost all policy areas, German respondents have a strong preference for making decisions based on a consensus between all member states and are reluctant to embrace differentiated integration – to work with only some

EU members – as they fear that this could divide the union”. Thus, from a political point of view, Germans are willing to pay the price of RP, lest the EU is divided.

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The Economic Effect of the COVID-19 Lockdown in the United States: Was the Cure Worse than the Disease?

L. Jan Reid

COVID-19 is an ongoing global outbreak of coronavirus disease 2019, an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The World Health Organization (WHO) declared the outbreak a Public Health Emergency of International Concern on January 30, 2020; and a pandemic on March 11, 2020. Several mitigation measures have been used in attempts to limit the spread of the virus, including mandatory wearing of masks in public; bans on unnecessary travel; and the closure of non-essential businesses. This paper defines a lockdown as the closure of non-essential businesses combined with requirements that all citizens stay at home except for grocery shopping, trips to a pharmacy, and medical appointments. The effectiveness of lockdowns is controversial. Proponents tend to argue that lockdowns would have been more effective if enforcement had been increased and if lockdowns had been extended for a longer period of time. Opponents have argued that lockdowns hurt the economy, hurt children, and have had little positive effect on public health. The paper addresses the economic effect of COVID-19 lockdowns in the United States using a Benefit/Cost Analysis (BCA) framework. Two separate analyses are provided: a traditional BCA analysis, which assumes that the value of life is constant regardless of age; and a Preferred Analysis, which adjusts the number of deaths, and values the economic cost of the deaths based on the age of the deceased.

Keywords: *benefit/cost analysis, COVID-19, GDP, lockdowns, unemployment*

Introduction

On March 11, 2020, the World Health Organization declared COVID-19 a pandemic¹. At a media briefing, WHO director-general Dr. Tedros Adhanom Ghebreyesus stated that “This is not just a public health crisis, it is a crisis that will touch every sector” (Ducharme 2020).

The first lockdown in the United States (U.S.) occurred in the territory of Puerto Rico on March 15, 2020. By the time of that first lockdown, only 102 people had died of COVID-19 in the United States. Lockdowns were fully implemented in most U.S. states by April 7, 2020. The number of deaths rose to a total of 167,558 by August 22, 2020 (National Center for Health Statistics 2020)².

This paper performs two Benefit/Cost Analyses (Traditional and Preferred) in order to estimate whether the economic cost of the lockdowns exceeded the economic benefits. The results indicate that the economic cost of the lockdowns was up to ten times greater than the economic benefits of the lockdowns.

¹The WHO defines a pandemic as the global spread of a new disease.

²The National Center for Health Statistics (NCHS) is a division of the Centers for Disease Control and Prevention (CDC), which is a division of the United States Department of Health and Human Services (HHS).

A Benefit/Cost Analysis is composed of two sections: a Base Case Analysis and a Sensitivity Analysis. The author's assumptions are those assumptions used in the Base Case Analysis. The Sensitivity Analysis consists of a "what if analysis". For example, a researcher might perform an economic analysis on the effect of the construction of a new highway. The Base Case Analysis might assume that the speed limit would be set at its current level of 70 miles per hour (mph) which is approximately 112 kilometers per hour (kph). The Sensitivity Analysis might assume that the speed limit would be changed to 55 mph (88 kph), resulting in fewer deaths. This does not mean that the author is assuming that the speed limit will be changed if a new highway is constructed.

Hypothesis

The paper hypothesizes that the economic cost of the lockdowns exceeded the economic benefits. The paper addresses the economic effect of COVID-19 lockdowns in the United States using a Benefit/Cost Analysis (BCA) framework. Two separate analyses are provided: a traditional BCA analysis, which assumes that the value of life is constant regardless of age; and a Preferred Analysis, which adjusts the number of lives saved, and values the economic cost of the lives saved based on the expected ages of the number of lives saved.

The goal of the lockdowns was to reduce the number of COVID-19 deaths and to ensure that Intensive Care Unit (ICU) capacity was sufficient to treat patients in critical condition. The paper finds that the lockdowns saved lives, but that the economic cost of the lockdowns was up to ten times greater than the economic benefits of the lockdowns.

Literature Review

The literature review explored the eight subjects discussed below. These subject areas were chosen because, taken together, they help explain much of the successes and failures of the economic lockdowns during the period of the study. The eight subjects are:

1. Coronaviruses
2. COVID-19 Cases and Deaths
3. Health-Care Spending
4. Macroeconomic Effects
5. Stimulus Programs
6. Benefit/Cost Analyses
7. Value of Life
8. Decline in Student Deaths

Coronaviruses

Coronaviruses are a class of ribonucleic acid (RNA) viruses that cause diseases in mammals and birds. In humans and birds, they cause respiratory-tract infections that can range from mild to lethal. Mild coronavirus illnesses in humans include some cases of the common cold (which is also caused by rhinoviruses). More lethal illnesses include Influenza, Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), and COVID-19 (CDC 2019).

According to the Centers for Disease Control and Prevention (CDC), influenza, commonly called “the flu,” is an infectious disease caused by influenza viruses. Influenza may progress to pneumonia, which can be caused by the primary viral infection or by a secondary bacterial infection. Other complications of influenza infection include acute respiratory distress syndrome, meningitis, encephalitis, and worsening of pre-existing health problems such as asthma and cardiovascular disease. In healthy individuals, influenza is rarely fatal, but it can be deadly in high-risk groups (CDC 2019).

Influenza deaths most commonly occur in high-risk groups, including young children, the elderly, and people with chronic health conditions. Since the late 1800s, worldwide outbreaks (pandemics) of novel influenza strains have occurred every 10-40 years. Five flu pandemics have occurred since 1900: the Spanish flu in 1918–1920, which was the most severe flu pandemic; the Asian flu in 1957; the Hong Kong flu in 1968; the Russian flu in 1977; and the 2009 swine flu pandemic. (CDC 2019) Worldwide mortalities were 20-50 million from the Spanish flu; 1.1 million from the Asian flu; 700,000 from the Russian flu; and 284,000 from the swine flu.

There have been over 4.9 million deaths worldwide from COVID-19 since October, 2019.

Cases and Deaths

The CDC has explained that “While seasonal influenza (flu) viruses are detected year-round in the United States, flu viruses are most common during the fall and winter. The exact timing and duration of flu seasons can vary, but influenza activity often begins to increase in October. Most of the time, flu activity peaks between December and February, although activity can last as late as May” (CDC 2018).

For the period 2010-2011 through 2019-2020, annual estimates of death from influenza in the United States have ranged from a low of 12,000 in 2011-2012 to a high of 61,000 in 2017-2018. In the last full influenza season (2018-2019) before the pandemic, 34,157 people died of influenza. (CDC 2021a) For the period January 4, 2020 through May 1, 2021, 493,985 people died of pneumonia; 276,282 people died of COVID-19 and pneumonia; and 9,273 people died of influenza (CDC 2021b). Thus, deaths from influenza declined by 24,884 ($34,157 - 9,273 = 24,884$), or 4.40% of the total number of official COVID-19 deaths.

The change in official influenza deaths indicates that at least 24,884 influenza deaths may have been misclassified as COVID-19. Therefore, I have reduced the

number of lives saved by 4.40% in the Sensitivity Analysis to the Preferred Analysis (see Table 7).

At the date of this writing, COVID-19 cases from 2020-2021 have exhibited the same seasonal pattern as the historic data of influenza in the United States. On March 7, 2021, the COVID Tracking Project (2021) found that the seven-day average of COVID-19 cases peaked on January 13, 2021 at 244,551 cases. The number of cases declined to 54,762 on March 7, 2021. (COVID Tracking Project 2021) This suggests that COVID-19 is a seasonal virus.

In an interview with NPR, Chris Murray of IHME said: “When you look at the huge [COVID-19] epidemics that unfolded in Argentina ... in Chile ... in Southern Brazil, South Africa, and ... the Northern hemisphere, . . . — ... in the statistical analysis, we see a very strong correlation with seasonality” (Aizenman 2020).

The CDC has reported that weekly provisional death counts for patients with COVID-19 rose from zero on January 4, 2020 to a high of 24,942 on January 9, 2021, and then fell to a low of 1,729 on May 1, 2021. The CDC has noted that: “COVID-19 death counts shown here may differ from other published sources, as data currently are lagged by an average of 1–2 weeks” (CDC 2021b).

Science, Public Health Policy and the Law published a paper which found that “Data from the CDC shows that only 6% of 161,392 COVID fatalities had no mention of any comorbidity. For deaths with conditions or causes in addition to COVID-19, on average, there were 2.6 additional conditions or causes per death” (Ealy et al. 2020).

On March 24, 2020, the CDC changed the guidelines for how cause of death from COVID-19 is recorded and reported. The new reporting guidelines substantially increased the number of deaths from COVID-19 (Ealy et al. 2020, p. 2).

Accurate reporting of deaths from COVID-19 is dependent upon test reliability. Lee (2020) examined the reliability of the PCR (polymerase chain reaction) test for detecting COVID-19 infection. (A PCR test is performed to detect genetic material from a specific organism, such as a virus or a bacterium.) Dr. Lee evaluated 20 test results from the Connecticut State Department of Health using a nested PCR amplification method. Dr. Lee found that the standard PCR test produced a false positive of 30% and a false negative of 20%.

Although Lee’s study does not contain enough observations to definitively find that PCR test kits produce biased results, it does suggest that the number of COVID-19 cases (and therefore deaths) might have been overestimated by 10%. As mentioned previously, influenza deaths declined by 24,946 (over 4% of official COVID-19 deaths). The decline in influenza deaths adds credibility to Lee’s finding that COVID-19 deaths might have been over counted by 10%.

As of April 14, 2021, a total of 563,440 individuals have died from COVID-19 in the United States (Yahoo News 2021). The CDC has reported that 4,270,407 people have died from all causes during the same period. (CDC 2021b) Thus, over 13% of U.S. deaths during that period were caused by COVID-19.

The Associated Press (2020) has reported that (Marchione 2021):

Life expectancy in the United States dropped a staggering one year during the first half of 2020 as the coronavirus pandemic caused its first wave of deaths, health officials are reporting.

Minorities suffered the biggest impact, with Black Americans losing nearly three years and Hispanics, nearly two years, according to preliminary estimates [on February 11, 2021] from the Centers for Disease Control and Prevention.

Forecasts of COVID-19 Deaths

On June 15, 2020, Reuters reported that “A new forecast projects 201,129 deaths due to COVID-19 in the United States through the beginning of October mainly due to reopening measures under way, the Institute for Health Metrics and Evaluation (IHME) at the University of Washington said on Monday” (Reuters 2020).

In September 2020, the University of Washington’s Institute for Health Metrics and Evaluation (IHME), headed by Chris Murray, forecast that 410,000 people would die of COVID-19 by January 1, 2021. Ashish Jha, dean of Brown University’s School of Public Health, said that IHME’s forecast is highly implausible — particularly when it comes to the projected 410,000 death toll in the U.S. by Jan. 1. “I think that’s completely unrealistic. I see no basis for that,” says Jha. (Aizenman 2020) The CDC reported that 389,371 people had died with COVID-19 by January 1, 2021 (CDC 2021b).

The September 2020 IHME forecast was much more optimistic than their forecast released in March 2021. In the March forecast, the IHME predicted that 598,521 Americans would die of COVID-19 by July 1, 2021. IHME also forecast that 655,566 people would die if the mobility of the U.S. population returns to 2019 levels (McIntyre 2021).

On April 21, 2021, the CDC reported the COVID-19 death forecasts of 36 modelers for the period April 19 to May 15, 2021. The average estimate of the models was that total deaths would rise to 595,522 by May 15, 2021 (CDC 2021c).

Table 1 compares the four mortality forecasts discussed above to the actual number of deaths in the time period predicted by the studies. The forecasts constitute a trend analysis in which the biggest driver of forecasted deaths is the number of deaths at the time the forecast was released.

Table 1. COVID-19 Mortality Forecasts

Source	Forecast Date	Ending Time Period	Mortality Forecast	Actual Deaths	Forecast Error (%)
IHME	June 2020	October 1, 2020	201,129	210,190	4.51%
CDC	June 2020	July 11, 2020	145,000	137,049	5.80%
IHME	September 2020	January 1, 2021	410,000	389,371	5.30%
CDC	April 2021	May 15, 2021	595,522	570,003*	4.29%*

As of May 8, 2021.

Lockdowns

On March 15, 2020, Puerto Rico governor Wanda Vázquez Garced signed an executive order ordering all citizens to stay at home starting at 9:00 p.m., with exceptions in limited circumstances between 5:00 a.m. and 9:00 p.m. Governmental operations and non-essential businesses were to be closed until March 30, 2020. On March 16, 2020, U.S. President Trump recommended that residents avoid discretionary travel, shopping trips, and social visits (Kelleher 2020).

On March 19, 2020, California governor Gavin Newsom issued a statewide lockdown order. By April 7, 2020, 43 of the 50 U.S. states had issued lockdown orders. The lockdown orders (“stay-at-home orders”) affected approximately 320 million people, about 96% of all U.S. residents.

On March 17, 2020, the first lockdown order from within a state was imposed simultaneously by health authorities in the San Francisco Bay Area (Alameda, Contra Costa, Marin, San Mateo, and Santa Clara counties and the cities of San Francisco and Berkeley), affecting nearly 6.7 million people (Ravani 2020). Other cities and counties across the state followed suit over the next two days, until Gavin Newsom, the governor of California, issued the first statewide order, effective on March 19, 2020 (Wired 2020).

Health Care Spending

Business Economics reported that “The HSEI [Health Sector Economic Indicators] spending brief data provide an initial look at health care spending during the COVID-19 pandemic. They show that the year-over-year change in national health spending began to decline in March of 2020, fell to more than 20% below the previous year’s level in April, and then began to recover. By August 2020, health spending had regained essentially all its losses compared with August 2019” (Rhyan et al. 2020).

While health care spending was falling, the price of health care was rising. The St. Louis Federal Reserve Board (FRED) has reported that the health care price index rose by 3.4% from August, 2019 to August, 2020 (FRED 2021a).

The paper did not include health care spending losses in its cost calculations because these losses are subsumed in the loss of nominal Gross Domestic Product (GDP).

Macroeconomic Effects

The official unemployment rate (U-3) as reported by the Bureau of Labor Statistics (BLS) rose from 3.5% in February, 2020 to a high of 14.8% in April, 2020 and then fell to 6.1% in April, 2021 (FRED 2021b). Cohen has found that 1.1 million workers had been misclassified by the BLS. Cohen adjusted the official unemployment rate and found that accounting for the misclassification “yields an adjusted unemployment rate of 9.1% in August [2020], which is meaningfully lower than 11.0% reading in July [2020] and a peak of 19.5% in April [2020]” (Cohen 2020).

Moutray found that “And, while the unemployment rate peaked at 14.7% in April [2020], the reality was even starker, with the “real” unemployment rate—which adds in those “marginally attached to the labor force and those employed part time for economic reasons”— at 22.8% that month” (Moutray 2020).

Stimulus Program

The United States Congress passed three separate stimulus bills: the CARES Act, the Consolidated Appropriations Act 2021, and the American Rescue Plan Act. Additionally, California Governor Gavin Newsom signed the Golden State Stimulus bill. These four bills are described below.

The CARES Act

The CARES Act was a \$2.2 trillion economic stimulus bill signed into law by President Donald Trump on March 27, 2020. The bill included \$300 billion in one-time cash payments to individuals and dependent children, \$260 billion in increased unemployment benefits, \$350 billion (later increased to \$669 billion) in funding for the Paycheck Protection Program that provided forgivable loans to small businesses for payroll expenses, \$500 billion in loans for corporations, and \$339.8 billion to state and local governments (Snell 2020).

Some of the benefits (such as federal unemployment and the eviction moratorium) of the CARES Act expired in July 2020. As a result, the number of Americans living in poverty increased dramatically. On October 15, 2020, the New York Times reported that “The number of poor people has grown by 8 million since May, according to researchers at Columbia University, after falling by 4 million at the pandemic’s start as a result of a \$2 trillion emergency package known as the Cares Act” (DeParle 2020).

Yahoo News reported that “Without the additional \$600 per week under the CARES Act — which expired at the end of July — local consumer spending will drop by an estimated 44%, according to a new paper from the National Bureau of Economic Research that examined how the cut in benefits will affect spending in 18 counties in Illinois” (Tsekova 2020).

The Consolidated Appropriations Act 2021

The Consolidated Appropriations Act 2021 (CAA) was a \$2.3 trillion spending bill that combines \$900 billion in stimulus relief with a \$1.4 trillion omnibus spending bill for the 2021 federal fiscal year. The bill was signed into law by President Trump on December 27, 2020, thereby preventing a government shutdown (Taylor 2020).

According to the Congressional Budget Office (CBO), the CAA provided \$325 billion for small businesses; \$15 billion for economically endangered live venues, movie theaters, and museums; \$166 billion for stimulus checks to individuals; \$120 billion for an extension of federal unemployment benefits; \$82 billion for public schools and universities; \$69 billion for vaccines, testing, and health providers; \$25 billion to state and local governments for rental assistance programs; \$13 billion to increase the monthly Supplemental Nutrition Assistance

Program (SNAP/food stamp) benefit by 15%; \$13 billion in direct payments to the farming and ranching industries; \$60 million for small meat and poultry processors; \$10 billion for child care, \$10 billion for the U.S. Postal Service; and an extension of the CDC's eviction moratorium (CBO 2020a, CBO 2020b).

The American Rescue Plan Act of 2021

The American Rescue Plan Act of 2021 (ARPA) was a \$1.9 trillion economic stimulus bill signed into law by President Biden on March 11, 2021. ARPA provided extended federal unemployment benefits, \$1,400 direct payments to individuals, emergency paid leave for over 100 million American, a tax credit to employers who offer paid sick leave and paid family leave benefits, extended food stamp benefits, expanded the child tax credit, expanded the earned income tax credit, made forgiven student loan debt tax-free, grants to small businesses, \$350 billion to state, local, and tribal governments, \$130 billion for K-12 schools, \$40 billion for public colleges and universities, \$48.8 billion for housing assistance, \$164.3 billion for healthcare programs and services, \$86 billion to pension funds that are close to insolvency, \$55.5 billion for transportation, \$10.4 billion for agricultural programs and services, and \$1.85 billion for cybersecurity funding (Zhou and Stewart 2021).

ARPA also subsidized 100% of premiums for Consolidated Omnibus Budget Reconciliation Act (COBRA)³ recipients from April 1, 2021 to September 30, 2021, removed the income limit on premium subsidies for the ACA, increased subsidies to low-income individuals, protected Affordable Care Act (ACA) subsidy recipients from clawbacks due to income fluctuations in 2020, required private insurance companies to cover COVID-19 vaccines and treatment, allowed states to give 12 months of postpartum coverage for new mothers, and provided new incentives for states to expand Medicaid coverage (Keith 2021).

Golden State Stimulus Bill

The Valley Post has reported that "Governor Gavin Newsom signed the \$9.6 billion "Golden State Stimulus" bill into law Tuesday, [February 23, 2021] which includes a \$600 check for low-income Californians" (Miller 2021). The bill provides a \$1,200 direct payment to up to 5.7 million tax return filers, and a \$600 payment to individuals who receive an earned income tax credit.

Benefit/Cost Analyses

Benefit/Cost Analysis, also known as Cost/Benefit Analysis, is commonly used in the development of public policy, such as the choice of whether to build a new highway or to impose environmental restrictions in a transportation corridor.

³For individuals who experience a job loss or other qualifying event, COBRA provides the option to continue their current health insurance coverage for a limited amount of time. Employers outside the federal government with more than 20 employees are required to offer COBRA coverage to those who qualify.

Value of Life

In public policy, the most important assumption in a Benefit/Cost Analysis is the value of life chosen by the analyst. In the case of COVID-19 lockdowns, a high value of life will tend to increase aggregate benefits and show that lockdowns were a good policy. A lower value of life will do the opposite.

Sumner et al. (2020) have pointed out that “Most of the publicized cost-benefit analyses of COVID-19 lockdowns have used coarse measures like lives as units rather than life-years, which misleads politicians and the public. COVID-19 deaths disproportionately impact the oldest members of the population, whereas the economic impacts of lockdowns disproportionately harm the youngest of the working population, who have far greater life expectancies at the time of impact” (Sumner et al. 2020).

Sumner et al. (2020) conducted a study commissioned by Revolver News and found that COVID-19 lockdowns are ten times more deadly than the actual COVID-19 virus in terms of years of life lost by American citizens. This paper uses a modified form of the analytical method used by Sumner et al. (2020). An earlier study commissioned by Just Facts found that the lockdowns caused a loss of seven times more years of life than were saved by the lockdowns (Miller 2020).

Forbes Magazine has published an article by Chris Conover of The Apothecary Group. Conover provides a listing of the Value of Life (VOL) used by different researchers. The fixed-rate VOL ranges from \$5 million by Aldy and Viscucchi to \$10 million by Alex Nowrasteh of the Cato Institute (Conover 2020). I use the average value of these studies (\$7.8 million) in my Traditional Analysis below.

Benefit/Cost Analyses

Anna Scherbina of the American Enterprise Institute estimated “a lockdown would be indeed optimal and, depending on the assumptions, it should last between two and four weeks and will generate a net benefit of up to \$1.2 trillion.” Scherbina employs a Quality-of-Life Year (QALY) method and assumes a value of \$150,000/QALY. She estimates that a maximum of 406,000 lives would be saved. Thus, she implicitly assumes an average of 39.6 QALYs/person (Scherbina 2021).

Broughel and Kotrous found that the benefits of COVID suppression policies would be from \$605.9 billion to \$841.1 billion and the costs would range from \$214.2 billion to \$331.5 billion. (Broughel Kotrous 2021, p. 156) Broughel and Kotrous’ study is for the period March 1 - August 1, 2020. 160,766 people died of COVID-19 during the time period of their study, which is about 30% of total COVID-19 deaths for the period January 1, 2020 to May 8, 2021. They assume 1.04 million lives saved and \$351.5 billion in benefits, which is an average value of life of \$337,980.77/person. Their work implies a Benefit/Cost (B/C) ratio of from 2.52 to 2.83, which indicates that lockdown policies had significant net benefits.

Dr. Ari Joffe used a Wellbeing Years (WELLBY) analysis and found that the costs of lockdowns were 5.2 times greater than the benefits of lockdowns in the United States. On average, Joffe assumes a VOL of \$500,000 per life (Joffe 2020, Table 8).

Hanson (2020) estimates that 3% of COVID-19 cases result in a loss of income for three weeks for those with severe cases. On October 12, 2020, Dr. David Cutler and Dr. Lawrence Summers published their estimate of the effects of lockdowns. They estimated that lockdowns would result in mental health impairment costs of \$1.581 trillion (Cutler and Summers 2020, Table).

Allen (2021) an economics professor at Simon Fraser University in Canada, states:

The term “lockdown” is used to generically refer to state actions that imposed various forms of non-pharmaceutical interventions. That is, the term will be used to include mandatory state-enforced closing of non-essential business, education, recreation, and spiritual facilities; mask and social distancing orders; stay-in-place orders; and restrictions on private social gatherings.

I adopt Dr. Allen’s definition of the term “lockdown”. Dr. Allen reviewed over 80 different academic studies and related COVID-19 data sites. He found that “All estimates of costs and benefits depend on various assumptions of parameters and structural model forms, and many of the studies examined (especially the early ones) relied on assumptions that were false, and which tended to over-estimate the benefits and under-estimate the costs of lockdown” (Allen 2021).

Allen issued a report and provided an alternative Cost/Benefit methodology. (Allen 2021, Section III) I adopt some of his suggestions in my Preferred Analysis given below.

School Shootings

The vast majority of schools were closed in 2020 due to COVID-19. This resulted in a decline in the number of student deaths in school shootings. In 2019, eight students were killed and 43 were injured in 25 shooting incidents that occurred on school grounds or during school-sponsored events, according to Education Week’s school shooting tracker (Education Week 2020). The paper includes the decline in student deaths as a Benefit in both the Traditional and the Preferred Analyses.

Methodology

The paper calculates a B/C ratio using the following steps for the Traditional Model:

- Econometrically estimate the time lag between infection and death.
- Sum the benefits of the lockdowns and the cost of the lockdowns.
- Divide the lockdown benefits by the lockdown costs and calculate a B/C ratio.
- If the B/C ratio is greater than 1, then the lockdown was an optimal public policy.

The paper calculates a Benefit/Cost ratio using the following additional steps for the Preferred Model:

1. Calculates an economic value of life (EVOL) for each age group.
2. Sums the individual EVOLs and includes these values as benefits in lives saved; and costs in lives lost due to suicides and to the unavailability of medical treatment for other illnesses such as heart attacks, cancer, and strokes.
3. Estimates the costs of losses in GDP due to the lockdowns.
4. Performs a sensitivity analysis incorporating the findings of Lee (2020) and Cutler and Simons (2020) and reports the modified B/C ratio.

I discuss each of these steps below.

Time Lag Regression

In order to estimate a B/C ratio, more information is required. It is necessary to estimate the time lag between COVID-19 infection and death from COVID-19. For example, COVID-19 deaths rose from 58 in the last week before the lockdown (week ending March 14, 2020) to 24,942 in the week ending on January 9, 2021. Some individuals who died after the lockdown began had COVID-19 before the lockdown. If the study did not account for the time lag between infections and deaths, one might intuitively reason that the lockdowns caused additional deaths from COVID-19. The paper estimates that the maximum lag between infection and death is two weeks and uses a two-week time lag in estimating the number of lives saved by the lockdowns.

The following methodology was used to estimate the time period between infection and death. Weekly data was collected from the CDC on COVID-19 infections and deaths for the period January 19, 2020 through May 1, 2021.

A regression equation was performed on infections and deaths, and coefficients were estimated using a first order Auto Regressive Moving Average (ARMA) regression model for the variables mentioned above.

The regression equation⁴ is $D = \alpha + \beta_1C + \beta_2C(-1) + \beta_3C(-2) + \beta_4C(-3) + \beta_5A + \beta_6M$

where:

A is an AR(1) term.

C is the number of infections at time t

C(-1), C(-2), and C(-3) are the number of cases at time t-1, t-2, and t-3, respectively.

D is the number of deaths in a given week.

M is an MA(1) term.

α is the constant term.

$\beta_1, -\beta_6$ are the estimated coefficients.

The regression output is given below.

⁴The AR(1) and MA(1) terms are used to adjust for serially correlated residuals.

Dependent Variable: DEATHS				
Method: ARMA Maximum Likelihood (OPG - BHHH)				
Date: 05/04/21 Time: 04:22				
Sample: 4 66				
Included observations: 63				
Convergence achieved after 22 iterations				
Coefficient covariance computed using outer product of gradients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-367.3282	5839.264	-0.062907	0.9501
CASES	0.005191	0.001617	3.209260	0.0022
CASES(-1)	0.004927	0.001942	2.536575	0.0141
CASES(-2)	0.004052	0.002650	1.529123	0.1320
CASES(-3)	0.002345	0.001756	1.335314	0.1873
AR(1)	0.927199	0.053703	17.26520	0.0000
MA(1)	0.792760	0.120098	6.600917	0.0000
SIGMASQ	718352.2	79940.09	8.986132	0.0000
R-squared	0.984676	Mean dependent var		8878.540
Adjusted R-squared	0.982725	S.D. dependent var		6901.649
S.E. of regression	907.1052	Akaike info criterion		16.64094
Sum squared resid	45256190	Schwarz criterion		16.91309
Log likelihood	-516.1897	Hannan-Quinn criter.		16.74798
F-statistic	504.8674	Durbin-Watson stat		1.244990
Prob(F-statistic)	0.000000			

The model results show that only the number of cases in the current week and the number of cases in a previous week had a significant effect on the number of COVID-19 deaths. Because the paper uses weekly data, an infection could have occurred at any time during a previous week. Thus, a maximum lag of two weeks is used in calculating a B/C ratio.

Number of Lives Saved

It is not possible to accurately estimate the number of lives saved by the lockdowns because we do not know how people would have reacted to ever-increasing COVID-19 cases and deaths. People could have decreased deaths by locking themselves down, or they could have increased deaths by moving from one state to another in an attempt to escape the virus. Allen (2021) has pointed out that “Goolsbee and Syverson (2020), using cellular phone location records, find that voluntary ‘self-lockdown’ explains most of the enormous change in behavior in the spring, and that they do not find evidence of large temporal or spatial shifting in response to shelter-in-place policies (p. 12)”.

Nevertheless, lives saved is too important a factor to be ignored in the analysis. As explained below, the paper uses the estimate for lives saved calculated by

Yakusheva et al. (2020). Yakusheva et al. (2020) estimated that the 2020 COVID-19-mitigating public health measures “will save between 913,762 and 2,046,322 lives in the US; however, the economic downturn from shelter-in-place measures and other restrictions on economic activity could create an indirect collateral loss of 84,000 to 514,800 lives over the following years” (Yakusheva et al. 2020).

There is a two-week lag between cases and deaths, and lockdowns were not fully implemented until April 7, 2021. Thus, the mortality savings associated with the lockdown orders would not have become evident until the week ending April 18, 2020. The growth in COVID-19 mortality rates is given in Table 2.

Table 2. COVID-19 Mortality Growth Rates by Week

Week Ending	COVID-19 Deaths	Weekly Mortality Growth Rate
February 22, 2020	5	N/A
February 29, 2020	9	80%
March 7, 2020	37	311.11%
March 14, 2020	57	54.05%
March 21, 2020	577	912.28%
March 28, 2020	3,186	452.17%
April 4, 2020	10,096	216.89%
April 11, 2020	16,270	61.15%
April 18, 2020	17,136	5.32%
Average	5,264	261.62%

As shown in Table 2, the weekly mortality rate had declined from 912.28% in the week ending March 21, 2020 to 5.32% in the week ending April 18, 2020. It is reasonable to assume that the death rate would have continued to decline in the following weeks.

The Traditional Analysis adopts the high estimate of lives saved (2,046,322) and the high estimate of “indirect collateral losses” (514,800) in the “following years” as estimated by Yakusheva et al. (2020). Their estimate is reasonable given the weekly mortality growth rates calculated above.

If we assume that the weekly mortality growth rate would decline to 3.4% for the weeks after April 18, 2020, a total of 2,544,634 persons would have died of COVID-19 during this time period. This would constitute a mortality reduction of 2,032,659 over the time period given above, or 13,643 less than the estimate of Yakusheva et al. (2020).

Nominal GDP Losses

The paper calculates the effect on GDP by subtracting the expected change in nominal GDP from the actual change in nominal GDP for the period 2020 Q2 to 2021 Q1. The first quarter of 2020 is omitted from the calculation because it occurred prior to the first lockdown. The expected change in GDP is the annual growth rate of GDP for the first three years (2017-2019) that President Trump was in office multiplied by the 2019 Q4 GDP. For example, if the growth rate was 6% and 2019 GDP was \$20 trillion, then expected GDP is $1.06(20) = \$21.2$ trillion.

GDP rose from \$19.03258 trillion in 2016 to \$21.74739 trillion in 2019, an annual growth rate of 4.54%. Thus, expected GDP for the period 2020 Q2 through 2021 Q1 is $1.0454(21.74739) = \$22.734726$ trillion. The nominal GDP in 2021 Q1 was \$22.048894 trillion, for a loss of slightly over \$685 billion (\$685,831,687,600).

Traffic Fatalities

Traffic fatalities rose from 36,096 in 2019 to 42,060 in 2020. The National Safety Council has explained that “[this] marks an 8% increase over 2019 in a year where people drove significantly less frequently because of the pandemic. The preliminary estimated rate of death on the roads last year spiked 24% over the previous 12-month period, despite miles driven dropping 13%” (National Safety Council 2021).

For the Traditional Analysis, the paper calculates the increase in traffic fatalities as a cost of 5,964 lives multiplied by \$7.8 million per life for a total cost of \$46.5192 billion. For the Preferred Analysis, the paper multiplies the increase in traffic fatalities by \$12.55 million for a total cost of \$74.85 billion.

Stimulus Programs

A total of \$6.4 trillion was spent on stimulus programs by federal and state governments⁵. Of this amount, \$122.4 billion was spent on non-lockdown related programs. Thus, the cost of the lockdown-related portion of the stimulus programs was \$6,177.6 billion.

Value of Life

Traditional Analysis

For the Traditional Analysis, the total VOL is the number of lives saved multiplied by each person’s value of life. Thus, the lives saved benefit in the Traditional Analysis is \$7.8 million multiplied by 2,046,322 = \$15,961,311,600 (approximately \$16 trillion).

Preferred Analysis

The Preferred Analysis uses an Economic Value of Life (EVOL). CDC data was available for the following age groups: under 1 year, 1-4 years, 5-14 years, 15-24 years, 18-29 years, 25-29 years, 30-34 years, 35-39 years, 40-44 years, 45-49 years, 50-54 years, 55-64 years, 65-74 years, 75-84 years, and 85 years and over. Because life expectancy is dependent on the age of the person, the paper uses a different life expectancy for each age group.

EVOL was calculated using an average of the age of each group. For example, the group of 30-34-year-olds was calculated using an age of 32. The formula for calculation of the EVOL is $EVOL = (\text{Life Expectancy} - \text{Age})(\text{Economic Value})$. Economic Value is calculated as the sum of GDP/Per Capita for each year of

⁵California is the only state that used its own funds to provide an economic stimulus to its residents.

expected life. Expected GDP and GDP Per Capita are updated for each year of expected life.

Let us suppose that a 75-year-old died of COVID-19 whose life expectancy was 85 years. That person's EVOL would be calculated by the formula $(\text{GDP Per Capita})_t + (\text{Expected GDP Per Capita})_{t+1} + (\text{Expected GDP Per Capita})_{t+2} + \dots + (\text{Expected GDP Per Capita})_{t+10}$. The EVOL for different age groups is given in Table 5.

Traditional Analysis

The Traditional Analysis yields a B/C ratio of 1.28. As shown in Table 3, there were approximately \$16 trillion in benefits and \$12.5 trillion in costs. Sensitivity Analyses (see Table 4) are used to show the effect on the B/C ratio if different assumptions are used. The B/C ratios in the Sensitivity Analysis range from 0.57 to 1.64. The paper notes that three out of four sensitivities yield a B/C ratio of less than 1.00.

Table 3. *Benefit/Cost Analysis Using a VOL of \$7.8 Million/Person*

Item	Benefit (\$ billion)	Cost (\$ billion)
Lives Saved (assumes 2,046,322 lives)	15,961.3	
GDP Loss		685.8
Cost of Federal Stimulus Programs		6,177.6
Cost of California Stimulus Program		9.6
Mental Health Impairment Costs		1,581
Increase in Traffic Fatalities		46.5
Lives lost from economic restrictions		4,015.4
Decline in student shootings	.0624	
Total	15,961.4	12,515.9

Table 4. *Sensitivity Analyses Using Different Assumptions*

Item	Total Benefits (\$ billion)	Total Costs (\$ billion)	Benefit/Cost Ratio
Sensitivity 1: Assumes the low estimate of lives saved	7,127.3	12,515.9	0.57
Sensitivity 2: Assumes the mean estimate of lives saved (1,023,618).	7,984.2	12,515.9	0.64
Sensitivity 3: Assumes a value of life of \$5 million/person and the high-cost estimate for lives saved.	10,231.6	12,515.9	0.82
Sensitivity 4: Assumes a value of life of \$10 million/person and the high-cost estimate for lives saved.	20,463.2	12,515.9	1.64
Average Sensitivity	11,451.6	12,515.9	0.92

Preferred Analysis

The Preferred Analysis yields a B/C ratio of 0.22. As shown in Table 3, there were approximately \$2.7 trillion in benefits and \$12.5 trillion in costs. Sensitivity Analyses (see Table 7) are used to show the effect on the B/C ratio if different assumptions are used. The B/C ratios in the Sensitivity Analysis range from 0.10 to 0.19. The results indicate that the cost of the lockdowns was up to ten times higher than the benefits of the lockdowns.

The Preferred Analysis uses an Economic Value of Life based on the estimated ages of the deceased. The Preferred Analysis uses the following assumptions.

1. Annual GDP per capita will increase at a rate of 3.01% per annum, which is the average annual increase in GDP per capita for the period 2011 Q1 to 2021 Q1.
2. The percent of lives saved in each age group will be identical to the percent of COVID-19 deaths in each age group.
3. The remaining life expectancy for each age group will be identical to the 2018 life expectancy as published by the National Vital Statistic Reports of the CDC (Arias and Xu 2020).
4. The average age of students killed in 2019 was from 5-14 years at an EVOL of \$15,969,563.09/student.
5. An EVOL of \$12.55 million/fatality was used to value the increase in traffic fatalities.

The economic value of life for each age group is given in Table 5.

Table 5. *The Economic Value of Life Assuming 1,955,465 Lives Saved*

Age Group	EVOL/ Person (\$)	Lives Saved	Age Group EVOL (\$ million)
Under 1 year	24,507,719	233	5,710.30
1-4 years	19,498,632	122	2,378.83
5-14 years	15,959,563	345	5,506.05
15-17 years	12,552,921	282	3,539.92
18-24 years	10,901,237	2,702	29,455.14
25-29 years	8,763,573	4,697	41,162.50
30-34 years	7,250,894	8,527	61,828.38
35-39 years	6,192,284	12,939	80,121.96
40-44 years	5,033,954	21,265	107,047.05
45-49 years	4,035,254	36,864	148,755.62
50-54 years	3,336,338	58,828	196,270.14
55-64 years	2,431,779	241,981	588.44
65-74 years	1,450,787	432,902	628.05
75-84 years	853,578	540,569	461.42
85 years and over	592,537	593,209	351.50
Total (\$ billion)			2,711.19

As shown in Table 5, EVOL decreases as a person ages. The reason is that older people have fewer expected years of life remaining than do younger people. The Preferred BCA estimates a total value of lives saved in Table 6.

Table 6. Benefit/Cost Analysis Using a Total Value of Lives Saved of \$2,711 billion

Item	Benefit (\$ billion)	Cost (\$ billion)
Lives Saved	2,711.19	
GDP Loss		685.8
Cost of Federal Stimulus Programs		6,177.6
Cost of California Stimulus Program		9.6
Mental Health Impairment Costs		1,581
Increase in Traffic Fatalities		74.9
Lives lost from economic restrictions		4,015.4
Decline in student shooting fatalities	0.12	
Total	2,711.3	12,544.3

Table 7. Sensitivity Analyses Using Different Assumptions

Item	Total Benefits (\$ billion)	Total Costs (\$ billion)	Benefit/Cost Ratio
Sensitivity 1: Assumes the low estimate of lives saved decreased by 4.44%.	1,220.9	12,544.3	0.10
Sensitivity 2: Assumes the mean estimate of lives saved.	1,966.1	12,544.3	0.16
Sensitivity 3: Reduces the number of lives saved by 10% due to testing errors.	2,440.1	12,544.3	0.19
Average Sensitivity	1,542.4	12,544.3	0.15

Conclusion

The paper analyzed the economic effect of the COVID-19-related lockdowns in the United States from March 15, 2020 to May 8, 2021. The author relied heavily on official CDC estimates of COVID-19 deaths. Additionally, the author reviewed news stories, academic literature, and independent reports for the period January 4, 2020 to May 8, 2021 and makes conclusions concerning the success or failure of the lockdown policies. The paper concludes that:

1. The cost of the lockdowns was up to ten times greater than the benefits of the lockdowns.
2. The economic value of life per person ranges from \$592 thousand to \$24.5 million, depending on the age of the individual.
3. The lockdowns have saved between 913,762 and 2,046,322 lives in the U.S.; however, the economic downturn from shelter-in-place measures and

other restrictions on economic activity could create an indirect collateral loss of 84,000 to 514,800 lives in the future.

4. The lockdowns caused a loss of nominal GDP of over \$685 billion.
5. The average mortality rate for COVID-19 is approximately 1.75%. There is a maximum lag of two weeks between COVID-19 infection and death.
6. Government officials and public opinion leaders underestimated the extent of the virus' spread and how long it would take to get the virus under control.
7. COVID-19 is a seasonal virus.

The paper hypothesized that the economic costs of the lockdowns exceeded their economic benefits. This hypothesis is tested empirically by analyzing the effect of the lockdowns using a Benefit/Cost framework. The paper found that the economic cost of the lockdowns exceeded the economic benefits.

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Post COVID-19 and the Acceptance of Financial Inclusion as a New Normal in Financial Transactions: Implications for Nigerian Accountants and other Financial Service Providers

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This study examined the preparedness of financial service providers to launch into the post COVID-19 era, using financial inclusion as a new normal in their clients' financial needs. The study adopted the survey research design, using a judgmental sampling technique. The questionnaire was used as the method of collecting data from 102 respondents, drawn from accounting firms, insurance companies, financial houses and pension fund administrators in Nigeria. With the aid of descriptive and inferential statistics, the hypotheses were tested at 5% level of significance. The findings revealed that there is a significant relationship between the socio-economic development structure in Nigeria and the acceptance of financial inclusion as a new normal in financial transactions. It was recommended that the public and private financial institutions be ready to provide the enabling environment for financial technology to thrive as a driver for financial inclusion in the Nigerian developing economy.

Keywords: *COVID-19 pandemic, financial technology, financial inclusion, new normal, financial service providers*

Introduction

Prior to the advent of COVID-19, many countries in the world had gone far in adopting strategies to promote and sustain financial inclusion. This is to emphasize that financial inclusion, as a subject matter is not new in finance and accounting. However, with the challenges posed by the pandemic, avenues must be sought to strengthen economic growth through the adoption of financial inclusion, embracing its numerous advantages, though its demerits must also be recognized and watched.

According to Sahay et al. (2020), during the COVID-19 pandemic, financial technology was intensified and this brought new opportunities for the use of digital financial services that accelerated and enhanced financial inclusion globally.

Nigeria as a developing economy did not lag behind in this re-invigorated trend in financial technology. Looking at the journey so far, since the adoption of the National Financial Inclusion Strategy by the Central Bank of Nigeria (CBN) in 2012, the pandemic period brought about heightened embrace of financial inclusion (CBN 2020). The CBN noted that the key performance indicators such as access to and usage of diverse, convenient and affordable financial services were in display and accepted by clients of the financial service providers in the country.

As a developing economy, access to and usage of financial services have a major impact on economic growth. This is what Fintech is known for, as it provides the enabling environment for financial inclusion that entails the delivery

of financial services at affordable costs for the financially underserved population, especially the rural dwellers (Nwanne 2015).

Adeyinka and Olugbamila (2015) take a position that financial inclusion, as a concept, came into limelight in the early 2000s, principally as a result of research findings which stressed that poverty and low economic growth in developing nations was as a result of financial exclusion. Similarly, Fung et al. (2014) assert that financial exclusion is the bane of economic under-development in developing nations. The motivation for financial inclusion was therefore rekindled in making entrepreneurs to have access to extensive financial products that are tailored to their needs and at reasonable costs during the period of the COVID-19 pandemic.

It is worthy to mention that policy makers and scholars did not have any idea of an impending pandemic, but with the emergence of COVID-19 pandemic, there is much need to increase the advocacy for adopting financial inclusion by developing nations, entrenching in their policies, beyond access and usage of financial services, to have the need for affordability, appropriateness and protection of financial service consumers. Therefore, as opined by De et al. (2016), access to financial services for the rural dwellers in every country in the world would catalyze development, reduce poverty and empower economic activities.

Constantinescu and Schiff (2014) assert that looking at the past two decades, the banking sector had predominantly been plagued by the traditional financial services where large pool of customers was excluded financially. In an earlier quest for a variant to the traditional banking system, Irechukwu (2000) opined that the Fintech sector has a tendency to grow and bring innovation through new methods of digital financial solutions that could be implemented to fill the gaps in response of the traditional banking sector that could not make financial services accessible to crisis-affected populations essentially.

The novel COVID-19 came up with its notoriety in pummeling economic blow to every country, Nigeria inclusive. The aim of this study therefore was to research on how financial inclusion as a tool for economic empowerment can be utilized by developing countries, for economic development and sustainability in the post COVID-19 era. The focus of the research was on the use of Fintech, as described by Sahay et al. (2020) as the technology-enabled innovation in financial services that could result in new business models, applications, processes or products with the attendant effect on the provision of financial services.

There have been various researches on Fintech and financial inclusion prior to the COVID-19 pandemic. Studies similar to this study were conducted on the determinants of financial inclusion in Africa by Evans and Adeboye (2016) and also Migap et al. (2015) on “Financial inclusion for inclusive growth: The Nigerian Perspective.” The model similar to what was used in this study was used, but gaps were created because those studies lacked the extraneous variables which affected business decisions as witnessed during the COVID-19 pandemic.

The gaps to be filled in this study therefore is based on the fact that COVID-19 incidentally brought a new normal, a concept which means accepting the reality of changes in the norms and values that were in operation before a new era, which cannot be reversed. This is the reality of what COVID-19 pandemic has brought to the entire world, and Nigeria as a country, in particular. The review and acceptance

of the new normal, with regards to financial inclusion in Nigeria would re-position a vast number of people, small enterprises and potential entrepreneur who were, and still are excluded from financial services (Mohan 2006).

Literature Review

For development to be sustainable in a country, there are various resources that are required to be utilized so that the economic, social and environmental needs of the populace can be met. In the first instance, there must be improvement on the quality of life from the earlier generation to the future.

Oluba (2008) opine that most adult Nigerians in rural areas do not have any transactions with financial institutions. This assertion implies that private and public financial service providers are not mostly available in the rural areas. More so, with the estimated population of over 200 million Nigerians, where a greater part of this number are rural dwellers, financial services are deficient. The stringent safeguard measures maintained during the pandemic gave a serious blow to economic development of this great West African country. Policies on financial inclusion should be re-designed and enforced as a new normal in the post COVID-19 era.

According to Beck et al. (2007) financial inclusion is a key dimension of, and a strategic means towards financial development of any country. This assertion is affirmed as it is more or less a means by which firms and households meet their financial needs at costs that are reasonable and affordable, as they participate in the formal financial system.

Adeyinka and Olugbamila (2015) suggest that economic development of a nation depends on how every sector of the economy functions and it was recommended that the formulation of clear policies among other things should be made by the government of the nation. This review is necessary as it is in line with our thought that things would never remain the same after the COVID-19 pandemic. In the pandemic era, physical access to domains and structures are done with utmost care, observing social distancing and avoiding contacts with persons to avoid contracting the virus. Financial services were disrupted negatively as noted by Sahay et al. (2020).

Uwah and Akinninyi (2020) opine that individuals are assumed to make choice according to the rank ordering of expected values. Therefore, from the theory of information economics/statistical decision, during the pandemic, financial service providers were affected in their financial returns. So were their clients. The need therefore arises that the formal method of providing financial services must be positively disrupted through digital access to and usage of such services. This could be through mobile phones and computers to access the internet, and financial service providers have to wake up to the challenge so as to abate an economic slide (Islam et al. 2017).

In this wise, financial inclusion could be seen as a means of formally getting financial transactions carried out, providing opportunities for payments and transfers of funds, savings, insurance services and a whole of other functions

which economic agents can offer. Nwanne (2015) noted that financial inclusion supports financial development, and failure to define its operations and concept could mean that the real effect expected of an inclusive financial system is underestimated or exaggerated. The concept of financial inclusion came up when it was realized that a section of the society made up of individual and businesses could not access the appropriate financial services from the main financial service providers (Nwanne 2015).

According to Leyshon and Thrift (1995) if one is not financially inclusive, then the other side of the coin, financial exclusion becomes imperative. For financial service providers in Nigeria to gear up towards financial inclusion as the new normal in the post COVID-19 era, it implies that their clients must not be financially excluded. Leyshon and Thrift (1995) maintained that the idea of financial exclusion first came up officially in 1993 when a group of geographers in a survey research discovered how limited the access to physical banking services had been, owing to massive closures of banks' branches.

Uwah and Udoayang (2020) posit that this situation escalated in recent times when banks had to close shops owing to the pandemic, and financial inclusion as a concept got a boost from financial service providers in order to balance the economic equilibrium. However, the authors were concerned about reporting issues, as earnings management may raise its ugly side if the new normal is not captured in financial reporting. As various scholars and academics have expressed their thoughts on the aftermath of COVID-19 in recent times, Singhraul and Batwe (2020) maintain that the outbreak of COVID-19 has affected human lives and services the world over. Situations in the post COVID-19 era, according to Singhraul and Batwe (2020) will either, give new boost, or depression to the world economy. The Gross Domestic Product (GDP) of a country might rise or fall, depending on how provision of goods and service are carried out, to stifle or stimulate the economy.

Financial inclusion, according to Hannig and Jansen (2010) could be that catalyst which would guarantee every economic agent, the accessibility to the use of basic financial services that would help in the growth of the economy.

Effiong et al. (2020) believe that it is the desire of every business to operate beyond the near future and maximize contributions and shareholders' wealth. It is also a new normal that COVID-19 pandemic has brought financial crisis to every country of the world, and for a country to sustain and grow its economy, there must be engagement in financial innovation so as to avert devastating systematic impacts. It is expected that international financial standard setters as well as financial regulators would make effort in streamlining financial standards to accommodate financial inclusion (Hannig and Jansen 2010).

Soludo (2008) puts it that for financial inclusion to present opportunities for enhancing financial stability in a destabilized financial setting, its acceptance would ensure that individuals and firms could access and use formal financial services in their transactions. There would be availability as well as accessibility of credit at costs favourable to the poor and the marginalized in the society (Onalapo 2015). As witnessed during the COVID-19 pandemic, International Monetary Fund (2020) observes that digital payment which includes payments using mobile

phones or operated online were greatly used by clients of financial service providers during the pandemic. Other services carried out during the pandemic in increased dimension were digital lending and credit. Credit activity involves the extension of funds through digital means, while digital lending was carried out through market place lending, e-commerce lending, online lending by banks, mobile lending and peer-to-peer lending (IMF 2020). Sahay et al. (2020) had buttressed that market place lending, which has to do with lending through digital platforms connecting lenders and borrowers was very paramount during the pandemic. The use of mobile money, the financial service offered to its clients by mobile network operators and their allies were also heightened.

In any event, Sarma and Pais (2011) assert that a financial system is said to be inclusive when it serves the needs of a wider spectrum of society in an affordable and efficient manner. They maintain that the socio-economic status of the client would not be considered as important if financial inclusion is to meet its objectives in the provision of the services by the financial service providers. Therefore, Cohen et al. (2006) maintain that when customers are satisfied, there is a tendency for the financial service provider to retain them. More so, there would be a promotion of efficient allocation of financial resources that is expected to increase economic growth and development in any given environment.

Financial Inclusion and the Financial Service Providers

Financial service providers cannot be successful in the implementation of financial inclusion, if financial technology is not embraced. This is the main reason financial service operators must be involved in digital economy, E-commerce and M-commerce. Anyalenkeya (2020) opine that digital economy is an economy that is based on digital transactions and people cannot be financially included if they are not involved in digital financial transactions. Anyalenkeya (2020) further outlined the five pillars of digital economy as digital infrastructure, digital platforms, digital financial services, digital entrepreneurship and digital skills.

Adeyinka and Olugbamila (2015) maintain that the digital economy uses the internet, and it is not limited by space or distance. The public sector as well as the private sector in Nigeria have to look inwards and collaborate to make this happen, otherwise the template for financial inclusion is nil. According to them, e-commerce is an emerging business driver that uses technology to fulfill commerce and/or deliver financial services and products to consumers. It thrives on online sales, insurance and digital payments.

Schmitz and Grayston (2020) assert that m-commerce involves the use of mobile technology. It entails buying and selling through mobile phones, mobile apps and other mobile compatible payment platforms. It stands out to be true that financial service providers who use financial technology platforms have easy operation of financial inclusion as they offer cheaper deals to customers and may not need to invest money in physical infrastructure. Therefore, in the context of post COVID-19, financial inclusion driven by financial technology as evidenced in e-commerce and m-commerce give consumers the benefit of having greater

choice of products and services they could buy them remotely, regardless of location. It is also opined by scholars (Soludo 2008, Swamy 2011, Sarma and Pais 2011) that financial inclusion in these dimensions allows financial service providers the opportunity to store more information on customers so as to offer them more personalized products or services.

It is evidenced that digital commerce is made possible through internet, cloud, mobile and social media. Therefore, accountants and other financial service providers must seek to be relevant in the post COVID-19 era by getting these infrastructures as assets in the new normal disposition.

The Concept of Intermediation and Financial Inclusion

Asuquo et al. (2020c) assert that financial intermediation as carried out by financial service providers will take a new turn, as a matter of fact in the post COVID-19 era. According to them, the national government should be ready to use micro-economic variables to control the economy owing to many modifications that are inherent in the new normal. The concept, modified operationally, has the capacity to bring financial providers together online, in a group, even though they are physically apart. In the same vein, target customers are brought online, to meet with them. The acceptance of this new concept of financial intermediation improves financial transactions through financial inclusion. Therefore, government must ensure price stability, redistribution of income from the high to low income earners and among many others, ensure the provision of social infrastructures within the economy to assist other responsibilities which could be done by the citizens and other private organizations. Accounting Standard setters should be ready to make adjustments and regulate financial accounting Standards to meet this new reality (Asuquo 2013). As opined by Mohan (2006) this new concept of financial intermediation has the benefit of eliminating wastages, because the financial service providers and their clients share resources, and pay lower than they would ordinarily have paid if they were taking it alone. The positive effect here is that the financial service providers would have more customers than they would have had.

Ojedokun (2020) maintains that the key digital trends that would shape the world economically and socially in the post COVID-19 era include big data, Blockchain, Artificial Intelligence (AI), machine learning, and quantum computing. It implies that the financial providers must be ready alongside the population of the geographical entity, and both must be ready to embrace the changes for economic sustainability to be achieved. The digital platforms in the post COVID-19 era would also ensure payments through Unstructured Supplementary Service Data (USSD), Automatic Teller Machines (ATM), Points of Sale (POS) gadgets and many more that are simple and easy to access, even in the rural areas. This is how economic activities can be supported for the new mode of business operations (Wakdok 2018).

Consideration by Accountants and Other Financial Service Providers as they Plan for the New Normal

According to Schmitz and Grayston (2020) uncertainty is the only certain thing lurking around businesses and their transactions during the COVID-19 pandemic. To move ahead and be certain of our businesses, it is pertinent for accountants and other financial service providers to prepare for the post COVID-19 world. The acceleration of digital transformation that many organizations had already set in motion prior to the COVID-19 era must be maintained. IMF (2020) says countries of the world, the developing economies inclusive, were already in motion to accepting new technological changes that would support business transactions into the future. In this dispensation, it is left for both consumers and financial service providers to embrace the change in technology so as to keep economic activities possible (Schmitz and Grayston 2020).

Rees (2020) maintain that the COVID-19 crisis has made it possible for services/goods providers and the consumers to have a sudden glimpse into a future world. This informs why technology adoption should be extended to, and adopted with speed by all developing countries, including Nigeria, if they are to remain relevant in the new normal (Asuquo et al. 2020b). Retailers have started moving to contactless and online shopping/delivery, while insurance companies and tax authorities have transitioned to self-service claims assessment. Organizations have rolled out technologies that enable remote working for the majority, if not all, of their workforce (Schmitz and Grayston 2020).

Rees (2020) outlined technological tools that can help financial service providers and their customers to move on, negating the impact of COVID-19 pandemic. Medical services providers are beginning to warn that the pandemic may become endemic, therefore, to remain relevant, accountants and other service providers in finance must do the needful, such as:

Putting the Right Connections in Place

Rees (2020) opines that Accountants and other financial service providers should be able to access their business data and applications. The use of cloud applications like Google Docs and Xero is easy and affordable and there should be the readiness to set up an outreach team with the remote access software. Adeyinka and Olugbamila (2015) emphasize that the greatest impediments to effective remote working are inadequate technology and infrastructure. These are provisions expected to be put in place by governments in developing economies, alongside with the organized private sector. These sectors, the public and private, would be the better for it in the long run, considering digital economy which the 21st century is rolling on effectively (William and Tavneet 2016).

Wakdok (2018) indicates that to optimally adopt and accept financial inclusion based on the provision of adequate technology and infrastructure, necessary risks assessment to elucidate the challenges of transitioning a workspace to remote environment must be carried out. Rees (2020) identifies the major concern here as finding the right mix of tools to assist in the transition, factoring in cybersecurity

concerns, employee wellbeing as well productivity and convenience. Singhraul and Batwe (2020) assert that financial service providers need to stay safe and secure in the new dispensation. According to Rees (2020) a security vendor recently detected more than 230,000 COVID-19 related cyber-attacks including, ransomware, business email compromises and malicious domains. These pose the threats that culminate into major challenge of securing business data in remote basis financial transactions of financial inclusion. To mitigate this, McEwan (2020) suggests the use of effective anti-virus software or other end point protection.

Swamy (2011) suggests that for financial inclusion to develop properly, financial service providers should also use the virtual private network (VPN) especially where the remote access software is used by the staff for on-premises systems. This makes it pertinent for financial service providers to keep in touch and motivate their clients.

Rees (2020) suggests the use of conferencing apps such as Zoom, GoTomeeting or Cisco Webex. He opines that a balance is expected to be maintained by financial service providers through minimizing any feelings of isolation that employees may have owing to the remote operations they engage in. These apps are therefore essential for regular team meetings so as to keep employees' minds on the job. Chat tools, such as 'Slack', 'Chanty' and 'Workplace by Facebook' can improve communication so greatly, even in rural settings, once the infrastructure is in place.

Another implication for financial service providers is how to manage remote teams effectively. According to McEwan (2020) cited in Rees (2020) "remote work success depends heavily on whether employees are entrusted to the work, even if managers do not see them." In Nigeria, for instance, it is obvious that the necessary gadgets that would help to keep track of the actual work being done by employees in remote basis by the financial service providers as owners of the business are available. The success of this, is still dependent on the provision of infrastructure to support the post COVID-19 era.

Ojedokun (2020) puts it that business transformation, using the cloud is something to consider by accountants and other financial service providers. McEwan (2020) says that in adapting to the pandemic, significant digital transformation is imperative for many businesses, and the clouds apps offer long-term business benefits. He maintains that migrating on-premises data to the cloud will make it easier to access files remotely and has the tendency to minimize or completely remove the expenses incidental to server's maintenance. It is noted that Microsoft's OneDrive, Google Drive or Dropbox Business are platforms that can do this (McEwan 2020).

To be relevant in the post COVID-19 era, accounting and finance professionals must ensure that customers' interaction is taken to a new level. Rees (2020) assert that in-person meetings are good, but even at the best of times, they are not always possible. The advent of conferencing apps has offered the opportunity to catch up with clients more often, and travel expenditure is reduced for the organization. Webinars become a great option for educating customers through apps like Zoom video and email newsletters are important in the new dispensation to keep customers informed and educated, giving solutions to whatever challenges the business entity or the clients may have (Anyalenkeya 2020).

The Institute of Chartered Accountants of Nigeria (ICAN) (2020) opines that it is apt to say that companies in the developing economies that would succeed in the new normal are likely to be those that are smart about identifying prospects and interact frequently with customers. ICAN in its 2020 Accountants' workshop on ICT proffers that while CRM systems were traditionally designed to help manage business clients, new platforms like Salesforce and Insightly have helped to market new consumers. These platforms, according to the Accountants' Institute, are equipped with advanced tools like analytics that could identify sales opportunities, manage sales staff, and more.

Asuquo et al. (2020a) want accountants and other financial service providers to adopt performance management best practices. The shift to remote working, as proposed in the post COVID-19 era will force managers to do away with traditional management practices that refused to grow with time (Nwanne, 2015). According to McEwan (2020) when the dust settles, we will see that our remotely working staff would be just as productive, if not more, than during the traditional era of managing staff and work. Sahay et al. (2020) believe that businesses in future, adopting technology with sophisticated key performance indicators will realize how effective their employees are and the much value the business is achieving.

Schmitz and Grayston (2020) believe that the firms that would succeed in adopting the right technologies in the post COVID-19 era, and adapting to flexible work arrangements are most likely to do better in their businesses, even in the future.

Exploiting Digital Disruption in the Post COVID-19 Era by Financial Service Providers

Digital disruption, according to Ojedokun (2020) are the changes that occur when new digital technologies and business models affect the value proposition of existing goods and services. According to him, disruption refers to a very specific process that explains how entrants can successfully compete with incumbents. It has to do with business model innovation that enables entrants to enter market with cheap, easy to use products. Digital disruption could be a combination of new and existing technologies, but the focus is the impact/influence it would have on the society. This concern is the acceptance the technology would have when the society notices the disruptive experience.

A model of digital disruption would show how new digital technologies (Cloud, Social mobile, Big data, Internet of everything) would give rise to New sources of value, which in turn would give rise to improved economics. The improve economics would then result in marginal cost reduction, wherewith customers' loyalty would increase, leading to high profit margin, revenue growth and eventually a higher enterprise value (Evans and Adeoye 2016). Ochi et al. (2021) opine that there would however be the vicious cycle of business growth and development, where the new sources of value will support new business models, and this in turn will support new types of customers and employees. The new types of customers and employees will support the new leadership styles

showcased by management, and the cycle will go back to support the new sources of value derived by the financial service providers.

Ojedokun (2020) maintains that digital disruption at any given level should have four basic elements, which are:

1. The business concept, which evaluates the current and potential market, business development plans, pricing strategies, delivery of services or goods and the like.
2. The technology that is in place, looking at inventions, the design and usage that the new technology will expose the business operation to.
3. The industry the business is found would influence the processes, standards that have been in existence and proposed changes to existing standards, methods of performance and how the customers will accept the changes.
4. The society where the disruption is going to be carried out is an important element to observe. This has to do with the culture of the people and how the change is welcome. What about their habits and movements of the new technology? This is what has recently been witnessed during the 5G Network technology movement in many parts of the world.

In the final analysis, digital disruption would prove useful in a post COVID-19 era if the business owners and the society would recognize the change, the financial service providers would build their identity in the new changes and our collective future is brought to life (Ojedokun 2020).

Audit Technology in the Post COVID-19 Era

Schmitz and Grayston (2020) assert that before the pandemic, many audit firms have been in the process of adopting technology-enabled audit processes, using digital client-platforms. It is practically seen in the COVID-19 pandemic situation that during the lockdown and afterwards, physical distancing has magnified the need for such technologies and platforms, especially when it relates to client engagements. Rees (2020) reported that an Auditor, Peter Kerr of the Australian National Audit Office, commented that audit in the post COVID-19 age is becoming an automated exercise. He said “COVID-19 just shows that the focus shifts from manual reconciliation to more automation. Technology fast-tracks audits through automated procedures.”

However, Hucklesby and Macdonald (2004) opined that for the new normal to balance with the technology adoption by accountants and other financial service providers, the clients need to be technologically up to date. In an audit situation, the new order demands that clients also need to have the technology in place to allow for data to be made accessible to the auditors.

Theoretical Framework

This study was based on some theories in Economics, accounting and finance, majorly the theory of information asymmetry, and theory of financial development.

The theory of information asymmetry that was developed in the 1970s and 1980s explains the financial constraints on small firms and poor borrowers and how intermediation would ensure efficient allocation of financial resources to avoid market failures. This also concerns an imbalance between buyers and sellers. In this context, the buyers are the clients in the financial inclusion net while the sellers are the financial service providers. When financial intermediaries are able to overcome the problems of information asymmetry, there would be efficient distribution of goods and services in a free market, and there would be no market failure. The post COVID-19 era would make the financial service providers to breast up and provide adequate information through digital channels, and this would meet the clients who use the service at the right time. This will then give adequate flow to financial development.

Theory of financial development has a proviso that private contractual arrangements form the basis of financial activities. More so, financial theory's legal adaptability holds that legal traditions differ in terms of their ability to adapt to changing commercial and financial circumstances. The theory provides that effective adaptation to changes in operating conditions will concomitantly support financial development more effectively. In this context, this includes financial structure, inclusion and deepening. Financial deepening has a nexus with financial inclusion as economists use it to refer to increased provision of financial services and better access for different socio-economic groups. A deepened financial system would encourage governments and organizations to set up public sector banks that can offer pro-poor services as part of financial sector reforms. This will be an improved performance from the traditional banking and other financial services provision. This theory ensures that a deepened financial system that is inclusive ensures both inclusive and pro-poor growth that is equitable. This is an aid to economic development.

Empirical Framework

Many authors have empirically studied the concept of financial inclusion at various dimensions, though a study has not yet linked the subject matter to the COVID-19 pandemic. Anyanwu (2004) empirically studied the empowerment of rural households through financial inclusion. He obtained secondary data, analyzed same and found out that there was a close relationship between financial inclusion and the empowerment of the rural dwellers. The study concluded that financial inclusion can enhance economic stimulus among economically weaker sections of a country, the rural dwellers.

Murari and Didwania (2010) investigated the impact of microfinance on poverty, using financial inclusion as a catalyst. The study, conducted in India adopted the regression analysis method and analyzed the secondary data obtained from banks and primary data from 260 rural dwellers in the country who did not

have incomes large enough to access banking facilities. The result indicated that financial inclusion has significant influence on poverty eradication and could provide self-employment opportunities for the poor and vulnerable in the society.

Swamy (2011) examined the trends of financial inclusion in India and found out that the number of banks is inadequate for the large rural population in India living in rural areas. It was concluded that greater number of small farmers was not included in the provision of basic financial facilities. This was believed to be responsible for the negative slope in the contribution of agriculture, the mainstay of the rural dwellers, to the Indian GDP.

Sarma and Pais (2011) researching on financial inclusion and development identified the factors that had significant association with financial inclusion in cross-country level. The study reveals that levels of human development in a country have a significant relationship with financial inclusion, though with few exceptions in the hypotheses tested. The study further revealed the significant relationship of financial inclusion with physical infrastructure. On the study of financial service providers, such as banks, the study however indicated that government ownership of banks was not significantly associated with financial inclusion.

Onaolapo (2015) studied the effect of financial inclusion on the economic growth of Nigeria. The major variables in the study were poverty reduction, and financial intermediation as indices of economic growth, while lending, means of payment and investments indicated for financial inclusion. The study found out that there is a significant relationship between financial inclusion and Nigerian economic growth. It was recommended that financial regulators in the Nigerian economic space should issue proper guidelines and regulations to encourage financial intermediation among the poor rural dwellers in Nigeria.

Gebrehiwot and Makina (2015) researched on “financial inclusion in Africa, using GMM dynamic panel data analysis”. The paper examined the determinants of financial inclusion across 27 African countries. They adopted a model that studied the problems plaguing against past studies of determinants of financial inclusion. Their model showed that financial inclusion is significantly and positively related to its lagged value, GDP per capita and mobile infrastructure, and negatively related to government borrowing. Their recommendation was that the upward trend of mobile infrastructure penetration in Africa is a welcome development and should be encouraged. In the same vein, the large ratio of government debt to GDP which hampers efforts to achieve financial inclusion should be minimized.

Methodology

This study adopted a survey, descriptive and causal research design. Therefore, an instrument, an unstructured or checklist questionnaire was drawn. The population of the study was 150 that included accounting/audit firms, insurance companies, financial houses, Central Bank of Nigeria, Pension Fund Administrators (PFAs), and accounting academics. The choice of this population was based on the

fact that corporate organizations, both private and government agencies in Nigeria and individuals have one stake or the other in the use of financial information and devices. We had the believe that their access to financial information can influence their decision about financial inclusion and increase in productivity which can enhance socio-economic activities in the post COVID-19 era.

Judgmental sampling technique was used to ensure that respondents to the administered questionnaire were drawn from the six geo-political zones of Nigeria. The Taro Yamane sampling size method was used to select 109 respondents across those six geo-political zones. The total number of instruments (questionnaire) retrieved, which we gathered data from were 102, and the data were analyzed using the Pearson Moment Correlation Coefficient at a 0.05 level of significance.

Model Development

The model for this study was developed as shown in the schematic representation of the conceptual framework.

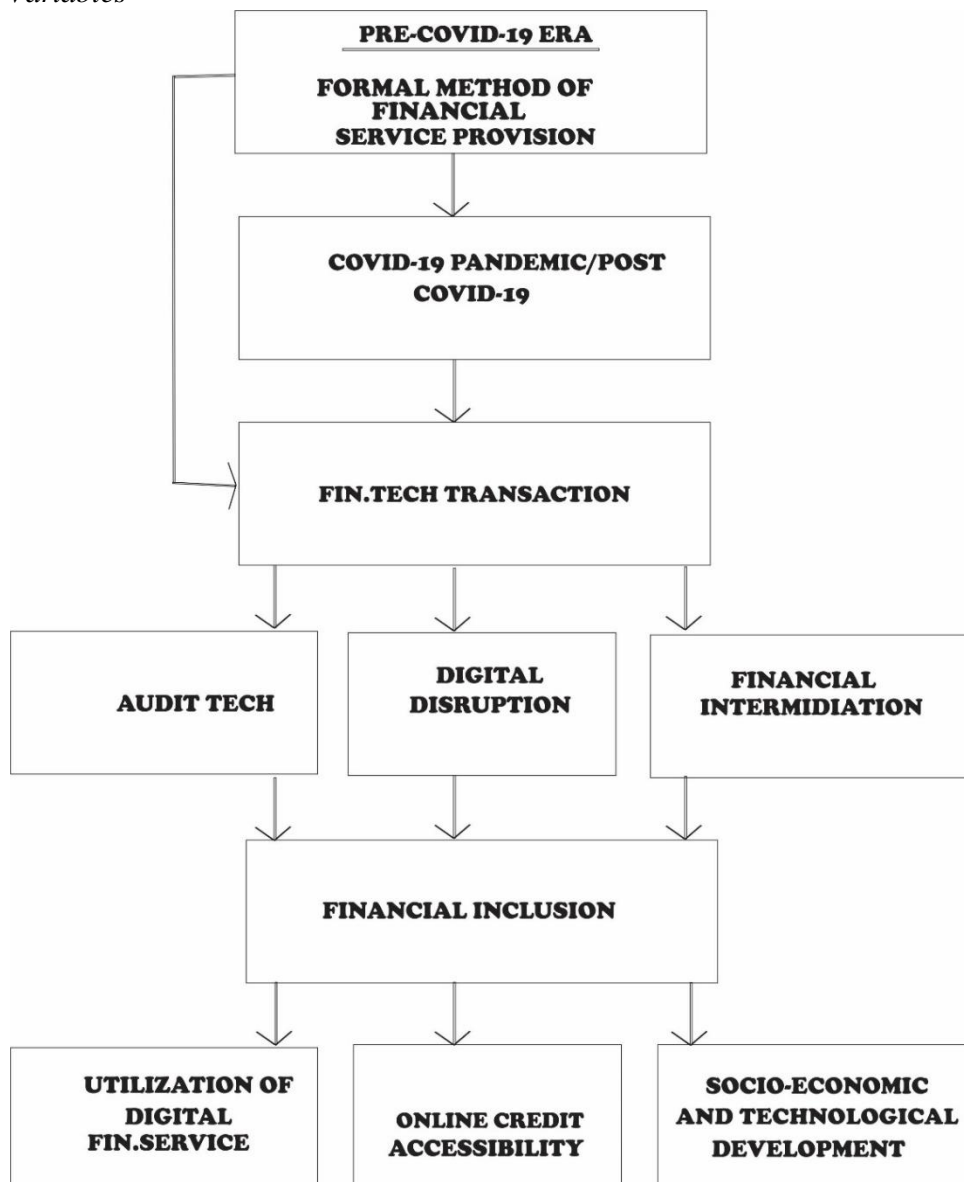
In the pre-COVID-19 era, the formal/traditional method of providing financial services by banks and other financial institutions was in vogue. Services that make up financial inclusion were skeletal, largely because of information asymmetry.

During the COVID-19 pandemic, the traditional method of financial services provision was disrupted and prominence was given to financial inclusion activities because of the lock-down and social distancing policies that were in force. Fintech transactions became a new norm in financial transactions during the time. The variables of Fintech in this study are: Audit Technology (AT); Digital Disruption (DD) and; Financial Intermediation (FN) which became a new normal in financial services and major drivers of financial inclusion. The benefits of financial inclusion therefore become its sub-variables, which are: Utilization of digital financial services; online credit accessibility, and; socio-economic and technological development.

Development of Hypotheses

The hypotheses for this study were developed based on the relationship amongst the variables as shown in Figure 1.

Figure 1. Schematic Representation of Conceptual Framework and Derivation of Variables



H₀1: There is no significant relationship between audit technology and financial inclusion in Nigeria.

H₀2: There is no significant relationship between digital disruption and financial inclusion in Nigeria.

H₀3: There is no significant relationship between financial intermediation and financial inclusion in Nigeria.

H₀4: There is no significant joint relationship between audit technology, digital disruption, financial intermediation and financial inclusion.

Model Specification

A relationship was established among the variables, using an adopted model from Uwah and Udoayang (2020), following the general equation for regression, $Y = f(X)$, indicating that Y depends on X,

The model was adapted as follows:

Financial Inclusion (FI) = $f(\text{Financial Technology Transactions})$

i.e., $FI = f(FT)$

and the equation is written as:

$$Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \mu$$

Where, α is the intercept, and $\beta_1, \beta_2, \beta_3$ are the coefficients of the variables respectively, which show the kind of relationship between dependent and independent variables and μ is known as the error term. Therefore,

Y = Dependent variable, which is financial inclusion.

X = Independent variable, which is Post COVID-19, with financial technology transactions as a major variable and the sub-sub variables were indicated by: audit technology, digital disruption and financial intermediation.

Financial inclusion, as the dependable variable was indicated by the following sub-variables: Utilization of digital financial services; Credit accessibility and; Socio-economic and Technical development.

A bivariate statistical analysis, the Pearson Moment Correlation Coefficient was used to test the above hypotheses using the data gathered from primary sources, and having established that a causal relationship existed between the data gathered, we had to test for evidence of good correlation.

From our model,

$$FI = f(FT)$$

$$FI = a_0 + \beta_1 AT + \beta_2 DD + \beta_3 FN + \mu$$

Where, AT = Audit technology.

DD = Digital disruption.

FN = Financial intermediation.

Testing of Hypotheses and Analysis

Hypotheses one to four were tested using SPSS. Financial inclusion as the dependent variable was used against the proxies of financial technology transactions, a major representative of the independent variable. A confidence interval of 95% was taken and the decision rule was to reject the null hypothesis if the calculated value, p , is less than the alpha value of 0.05 ($p < 0.05$) and to accept, if otherwise.

Results and Discussion

This section shows the tables and the findings from the study with the associated results.

Table 1. Correlation Analysis Showing the Relationship between Financial Technology Transactions’ Sub-Variables and Financial Inclusion

Pearson Correlation	F INCLUSION	AT	DD	FN
F INCLUSION	1.000	0.770	0.156	0.843
AT	0.770	1.000	0.082	0.734
DD	0.156	0.082	1.000	-0.096
FN	0.843	0.734	-0.096	1.000
Sig.(1-tailed)				
F INCLUSION	.	0.000	0.115	0.000
AT	0.000	.	0.265	0.000
DD	0.115	0.265	.	0.000
FN	0.000	0.000	0.230	.
N				
F INCLUSION	102	102	102	102
AT	102	102	102	102
DD	102	102	102	102
FN	102	102	102	102

Source: SPSS V.20 Field Data Analysis (2020).

The data are presented with tables and analyzed using SPSS Package. In Table 1, the entire pair wise correlation coefficients indicate the actual significance level for each correlation. The table reveals that financial inclusion correlates with Audit Technology (AT) at 0.77 that shows a high correlation level (about 77%) of relationship. The table also reveals that the p -value is less than the alpha level ($p < 0.05$). This was significant at 0.000. Using our decision rule, the null hypothesis 1 was rejected, and the alternate accepted. This means that there is significant relationship between utilization of digital financial services through financial inclusion and Audit technology.

Hypothesis 2 was on financial inclusion and the proxy of financial technology transactions. Using Digital Disruption as a sub-variable of financial technology transactions, the correlation with online credit accessibility has r of 0.16, an insignificant relationship of a paltry 16%. However, the table reveals that the

calculated p is greater than the alpha level ($p > 0.05$). Therefore, using our decision rule, null hypothesis 2 is accepted.

In the same vein, hypothesis 3 on financial inclusion and financial intermediation as a new normal caused by COVID-19 pandemic in Nigeria was tested. The relationship has r of 0.84 as the correlation between financial intermediation and Socio-economic and Technical development, a significant correlation of about 84%. With Table 1 showing the calculated p-value being less than the alpha value ($p < 0.05$), the null hypothesis was rejected, using our decision rule. This means there is significant relationship between financial inclusion and financial intermediation.

Table 2. Analysis of Variance (ANOVA) Associated with Multiple Regressions on the Joint Relationship between Variables of Financial Technology Transactions and Financial Inclusion

Model	Sum of Squares	df	Mean Square	F	R	R ²	Adjusted R ²	Sig.	Result
Regression	59.262	4	14.816						
Residual	10.475	56	0.187						
Total	69.738	60		79.203	0.922**	0.850	0.839	0.000	Significant

**Dependent variable: Financial inclusion. *Independent variable: Financial Technology Transactions (AT, DD, FN).

Source: SPSS V.20 Field Data Analysis (2020).

Table 2 shows analysis of variance (ANOVA) which indicates that when the multiple correlation is converted to F, it shows an F ratio of 79.20 that is significant at 0.000. This depicts that all the sub-variables of financial technology transactions in this study when jointly regressed against financial inclusion had a lower p-value than the alpha value ($p < 0.05$). A multiple correlation coefficient, R of 0.922 was also realized, indicating a very high correlation. The R² value of 0.850 indicates that all the independent variables combined contribute about 85% to financial inclusion. Therefore, with a lower p-value of 0.000 that is lower than the 0.05 value, the null hypothesis 4 was rejected. This implies that there is significant joint relationship between Audit Technology; Digital Disruption; Financial Intermediation, and Financial inclusion.

Table 3. Coefficients of the Joint Relationship between Variables of Financial Technology Transactions and Financial Inclusion

Model	Unstandardized Coefficients		Standardized Coefficients	95% Confidence interval for B		t	Sig.
	B	Std. Error		Lower Bound	Upper Bound		
(Constant)	-1.025	0.224		-1.474	-0.576	-4.573	0.000
AT	-0.013	0.093	-0.014	-0.199	0.173	0.138	0.890
DD	0.085	0.053	0.094	-0.021	0.190	1.609	0.113
FN	0.680	0.080	0.665	0.520	0.841	8.483	0.000

Source: SPSS V.20 Field Data Analysis (2020).

Table 3 shows the coefficients of the joint relationship between variables of financial technology transactions adopted for this study and financial inclusion. The regression shows a significant relationship (0.000) in the overall, though the relationship of AT and DD do not show significant values. The Beta for AT is -0.014 (not significant, $p > 0.05$), 0.094 for DD (not significant, $p > 0.05$).

In Table 1, the pair wise correlation coefficients show the level of significance for each correlation. Financial inclusion and Audit Technology (AT) has r of 0.77, or 77% relationship, indicating a high correlation. Equally, the table reveals that the p -value is less than the alpha level ($p < 0.05$) and was significant at 0.000. Since the null hypothesis was rejected, it means that audit technology, relate significantly with financial inclusion through the utilization of digital financial services. It is possible that this result arose because of the automation of audit services. During the pandemic, social distancing was observed and for the service to continue, Auditors adopted the automation of their roles to the clients. The result, as it were, is an indication that aside from the Auditors, the clients are ready for digitalization of their work, so that the auditors can be effective and efficient in their audit functions.

Hypothesis 2 showed an insignificant relationship between digital disruption and financial inclusion, with online credit accessibility as its proxy. The reason for non-correlation of the variables is believed to be as a result of slow adoption of digital services by the service providers as well as their clients. In Nigeria, power supply is epileptic with most customers not being able to power their mobile phones and other accessories that supports the digital disruption. The drag in providing this technology owing to environmental conditions could be responsible for this result.

Hypothesis 3 that was on the relationship between financial intermediation and financial inclusion, represented by socio-economic and technological development showed a significant result. This result may be as a result of the lower cost of transacting loans and other payments, which hitherto, would have taken the rural dwellers out of their comfort zone to negotiate for such facilities. With the encouragement and campaign for SMEs in Nigeria to be involved in e-commerce, the people have cashed in on the development to have easy business mechanism than it used to be when it was manually operated.

Hypothesis 4 measured the joint relationship between the sub-variables of the independent and dependent variables. The result showed a positive relationship. This may likely be from the fact that financial inclusion is accepted by majority of rural and urban dwellers in Nigeria. It is easily understood that there is cost reduction and time-saving when the era of formal financial services provision is compared with what is obtained in the digital dispensation of doing business. There have been various groups and individuals making advocacy for the adoption of the 'new normal' because of its simplicity.

Conclusion and Recommendations

This study was conducted to examine the relationship existing between the Fintech-enabled ‘new normal’ arising from the activities of the COVID-19 pandemic. Variables supporting the digital technology and those supporting financial inclusion were regressed against each other, and the result gave an overwhelming support that the role of accountants and other financial service providers should move beyond the traditional formal financial service provision, to adopting and moving ahead with the ‘new normal’ services to their clients.

This study recommends that the governments (Federal and States) in Nigeria who are in charge of the public sector economy should provide the enabling environment for financial technology to thrive as a driver for financial inclusion.

The private sector which is the domain of investors and financial service providers should realize that in a competitive world that we are, most investors will close shop to their competitors if they are not willing to move along with technology.

The socio-economic indices of development are still very low in Nigeria. There must be active participation by the rural dwellers who are the majority of the population. More so, the small-scale entrepreneurs who are known to contribute so much for economic development, should be encouraged to be financially inclusive.

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COVID-19 Pandemic and Business Survival as Mediation on the Performance of Firms in the FMCG-Sector

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Ekpenyong Ekpenyong Udofia & Oluwaseun Ademola Adenigba*

COVID-19 pandemic has become a global issue causing the restriction of people and international trading and it has affected the loss of jobs and closure of firms all over the world. This paper aims to examine COVID-19 pandemic and business survival as a mediation on the performance of firms in the Fast moving consumer goods (FMCG) sector: insight for the future of business operation. Cross-sectional survey research design was adopted making use of stratified and simple random sampling technique as a guide to select participants while data analysis was subjected to exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and structural equation model (SEM). The findings show that COVID-19 pandemic has affected the performance and survival of businesses in Nigeria leading to the loss of jobs, firm productivity, customer retention, increase unemployment rate, closure of businesses and GDP of Nigeria as a whole. The research has been able to provide insight on the need for full integration of technology into all the firm operational process and for the firm to remain flexible to accommodate changes as imposed on the firm's operations through environmental uncertainties such as the pandemic. The study is the first of its kind to examine the extent of the effect that COVID-19 pandemic have had on the survival, performance of businesses and the gross domestic product (GDP) of the country since its eruption and announcement in China and has been able to provide insight by exposing most organization's weakness especially with regard to technology-adoption and its integration into all the firm operational capabilities as is the reason why most firm struggle to meets customer needs during the lockdown.

Keywords: *COVID-19 pandemic, performance, survival, customer retention, Nigerian economy, GDP*

Introduction

The novel corona virus (COVID-19) pandemic ravaging the world sprung from Wuhan City, China and has since spread its tentacles to over 216 countries of the world. There are 4,125,533 global cases and 280,965 deaths as at Mid-May, 2020 (Kampf et al. 2020). However, investment in research and development on vaccine creation to combat the effect of COVID-19 has practically reduce the global cases to 111, 419, 939 and 2,470,772 deaths as at late August 2021 (Wang and Tu 2020). The last pandemic that halted business activities and social gathering was the Spanish flu. The COVID-19 pandemic brought a new way of life, business and otherwise (Nicola et al. 2020). The major worry and cause of anxiety in the business world as at 2019 was the trade war happening between the United States of America and China, coupled with the move for Brexit. The anxiety in the business world was focused on the impact the trade war and Brexit will have on

the global economy and analysts are split on the impact (Michie 2020). The International Monetary fund (IMF) also joined in the debate predicting a moderate growth of about 3.4% of the global economy (Bentolila et al. 2019).

COVID-19 pandemic brought a disruption like no other (Ozili and Arun 2020), business environment uncertainty necessitates critical decisions for survival, including laying off of workers, salary cuts by as high as 75%, and compulsory leave without pay (Nadeem 2020). Global stock dipped with a stock market loss of about USD 6 trillion within a week of the pandemic outbreak declaration, while the United States recorded its highest unemployment rate (14.7%) since the great economic depression era (Bernanke 2020). Nigeria is not left out of the crisis as price of crude oil (being the major export and foreign currency earner for Nigeria) fell. The price of crude oil as at January, 2021, was about \$54.77, and highly unstable, while Nigeria forecasted \$57. The difference in price will trigger government borrowing to cushion the effect (Ozili and Arun 2020), while the Nigerian economic temporary shut-down had tremendous impact (Nkengasong and Mankoula 2020). Due to the COVID-19 pandemic, businesses have had to shut down operations, significant number of jobs were lost, low production especially for essential firms producing consumables goods and services. This pandemic gave rise to technology inclined firms to thrive and many employees were forced to work from home.

Thus, as the pandemic is exposing the weakness in most countries labour force especially Nigeria making many jobs to become obsolete and thereby leading to joblessness, it also gave voices to technology inclined organizations and some technological software (Zoom, meetings etc.) to become the new order of holding and conducting business meetings, delegating task and a means to assess employee performance and productivity since physical contact is discouraged due the COVID-19 pandemic. This shows that as the pandemic is disrupting the usual physical work flow and schedule, it is also indirectly preparing the mind-set of the people especially organizations and government all over the world to adopt and fully integrate a virtual work mode that's capable of delivering expected result in terms of conducting businesses, meetings and all forms of transactions and engagements (Türker 2012, Allam and Jones 2020).

FMCG is one of the most essential sectors contributing significantly to Nigeria's GDP. The fast moving consumer goods (FMCG) sector are responsible for the production of essential product and services necessary for everyday living and this is why many government all over the world including Nigeria gave firms in this sector special privileges to operate at a minimum capacity in order to cater for the essential needs of their citizens during the lockdown (Barua 2020, KPMG 2020). In Nigeria, food, beverage and tobacco subsector of the FMCG industry contribute up to 5% of the total GDP of the country in 2019. Furthermore, the Nigerian stock exchange market report that FMCG sector constitute 17% of the value of equity in its market capitalization (KPMG 2020). This shows the significance of the sector to the Nigeria economy. While some other studies have examined the implication of COVID-19 on the oil sector and the educational sector in Nigeria, there's still dearth of study on the implication of the COVID-19 pandemic, this serves as the novelty of this study as this study researched on the impact of the

pandemic in the FMCG sector vis a vis the health challenges created by COVID-19, the uncertainty in the global business outlook, the shutdown of businesses in Nigeria, and the looming recession which necessitated a study to appraise the challenges posed by COVID-19 on business survival, with focus on the FMCG sector.

Literature Review

COVID-19

Research show that Corona Virus (COVID-19) is from a large number of viruses which usually cause sickness linked to common cold, severe acute respiratory syndrome (SARS-CoV), middle east respiratory syndrome (MERS-CoV), etc. Global cases increase daily despite measures to reduce the spread, alas, the spread of the COVID-19 virus remains very high and astounding (Açikgöz and Günay 2020). COVID-19 can be described as a global pandemic simultaneously affecting all spheres, and little hope kindles bearing in mind that a vaccine is unavailable as at late 2020 (Anderson et al. 2020). However, the first quarter of 2021 recorded many significant breakthroughs in the development of COVID-19 vaccines in countries such as USA, Russia, and UK among others (Wang and Tu 2020). There is possibility for increased individualization, less need for religious gatherings, and governments will adopt new forms of engagement regarding economic, social or political integration to mitigate the spread (Gössling et al. 2020).

Global Economy and COVID-19

China, the virus's origin has over 1.4 billion population. China's economy was beginning to rank with the United States before the outbreak of the pandemic; clocking \$13.7 trillion as gross domestic product (GDP). China started battling with the outbreak of the virus around December, 2019, leading to shut down of almost all activities as demand and supply also plummet; affecting the Chinese economy in the first quarter of 2020 and spilled over to other economies (Açikgöz and Günay 2020). The global economy has been projected to fall by 2.4% in 2020 due to the outbreak of the pandemic, while some experts predict worse (1.5%) come first quarter of 2021 (Barua 2020).

China shut-down meant 20.2% of world's total crude oil became redundant. In addition, oil price war between Saudi Arabia and Russia adversely affected oil price (Michie 2020). International Labour Organization (ILO) projected 5.3 million to 24.7 million job loss due to the pandemic, tethered to revenue loss (between \$860 billion to \$3.4 trillion) by December, 2020. Such revenue loss can trigger global financial crisis and recession (Bloomberg 2020b). The global stock market price is falling sharply over the uncertainty in the global economy as the FTSE, Nikkei, Dow Jones have all witnessed share price fall since the beginning of the COVID-19 pandemic (Anderson et al. 2020). The United States had to inject \$2.2 trillion into the economy to save the vulnerable citizens, the United Kingdom did

likewise by paying up to 80% of employees' wages to prevent massive layoffs, bankruptcy, and economic meltdown. The major problem is experts predict an economic recession after the pandemic (Bernanke 2020).

FMCG Sector and COVID-19 Pandemic in Nigeria

The outbreak of the COVID 19 pandemic brought unprecedented challenges to the FMCG sector in Nigeria. The COVID 19 pandemic led to a drastic fall in the demand for goods and services by consumers while some manufacturers had to shut down completely in order to obey government regulations and to prevent spread of the virus among their workforce (Adesoji and Simplice 2020, National Bureau of Statistics 2020b). While safety measures are being embraced and COVID 19 strictly being adhered to by firms in the FMCG sector in Nigeria, this outbreak and after some months of partial operations, most of the firms in the FMCG sector in Nigeria had to fully shutdown their production operations (KPMG 2020). Few firms in the sector tried to rise to the occasion by seeking innovative means of dealing with the situation but it was a situation not foreseen and most of these firms in the FMCG sector in Nigeria end up incurring more cost than usual leading to more disruptions in production. The restrictions imposed on Nigeria's border trade by the Federal Government of Nigeria due to the pandemic outbreak also significantly disrupted supply chain for the FMCG sector starving them some components of raw materials needed for continued production and placing them also at the verge of losing some already acquired materials for production due to material expiry and inability to continue production activities (National Bureau of Statistics 2020a). Some states in Nigeria like Lagos state and Ogun state which are the major hubs used by FMCG firms for production were also in total shutdown as directed by the government due to the COVID 19 pandemic outbreak, this total shutdown further acted as a bigger impediment for production thereby forcing production in the sector close to a near zero margin (KPMG 2020). The FMCG sector is projected to contribute 5% of Nigeria's GDP before the COVID 19 pandemic outbreak and the question remains if the FMCG sector in Nigeria will still be able to contribute this percentage to Nigeria's GDP post COVID 19 or if the sector itself will be able to bounce back from the present near zero production and operation.

COVID-19 and the Nigeria Economy

The outbreak of the COVID-19 pandemic disrupted economic and business activities in Nigeria like most other parts of the world; The Nigeria government in recent time has not experienced such pandemic and also did not have any preparations in place to cushion the effect of the COVID-19 pandemic. Nigeria's economy high dependence on imports especially imports from China aggravated Nigeria's economy vulnerability as imports and raw material imports from China into Nigeria's economy constitutes about 70%. Also, Asia and Europe combined contributed about 86% of Nigeria's import indicating that the restrictions imposed across Asia and Europe on cross border trades has distorted supply chains to

Nigeria and starving the Nigeria economy the needed raw material input for production (National Bureau of Statistics 2020c). The total lockdown order and travel restrictions from various parts of the world limited Nigeria's economy access to raw materials and also prevented export of goods and services from Nigeria's economy to other economies of the world which in turn starved the Nigeria economy from earning foreign exchange that could have help further to boost the economy. The global oil price also went from over \$62 to as low as \$23 due to the outbreak of the COVID-19 pandemic; this had a devastating effect on Nigeria's economy because Nigeria economy is majorly dependent on crude oil export and Nigeria mostly earn her major foreign exchange from oil export (Bloomberg 2020b, Ozili and Arun 2020).

The Nigeria Federal Government also had to embark on some strict measures necessitating cutting of spending and expenditure while putting available resources into managing the health pandemic brought about by COVID 19, though the move by the Federal Government of Nigeria was logical bearing the serious need to curtail the COVID-19 virus but the move also lead to other aspect of the economy been starved of needed fund (Adesoji and Simplice 2020). The Nigeria economy is also expected to experience one of its deepest recession since 1980s due majorly to the COVID-19 pandemic outbreak and the disruptions caused by the COVID-19 pandemic. The Nigeria economy has witnessed disruptions leading to lower oil prices and remittances, enhanced risk aversion in global and local markets; the Nigeria economy is also projected to contract around 4% due to the COVID-19 pandemic (World Bank 2020b). While the Federal Government of Nigeria is still working on how to revive the economy, it's still very uncertain how long the recovery of the Nigeria economy will take and if the current effort of the Nigeria government will yield the desired result.

Underpinning Theory

Profit Maximization Theory and Survival-base Theory

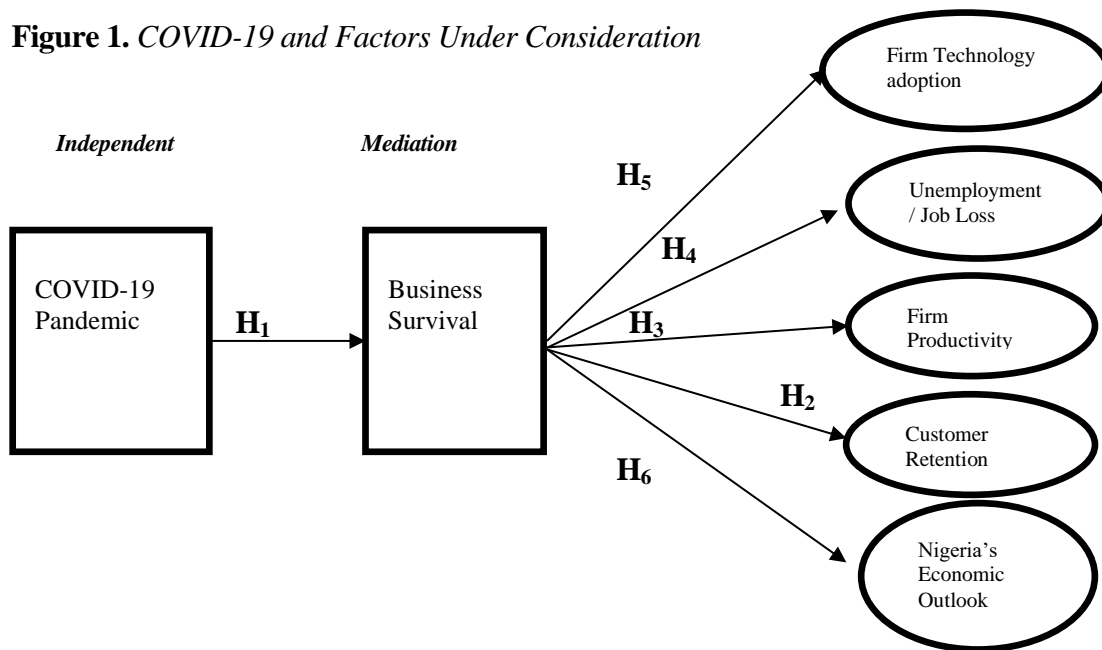
Profit maximization theory was propounded by Adam Smith and was first used in his publication titled the wealth of nations, stating every business will act in self interest in order to maximize profit from their business engagements. While the Survival-based theory was originally developed by Herbert Spencer (Miesing and Preble 1985), the theory was very popular in the 19th and 20th century and the theory places emphasis on survival of the fittest as every business organization will put every available strategy in place to ensure survival. The theory of profit maximization argues that every business owner or organization will act in self-interest at every point in time in order to maximize profit, ensure longevity and to increase aggregate benefit derived by the society (Lynch et al. 2000, Jafar et al. 2010). The theory also assumed an economic perspective reiterating that organizations seek to maximize profit by equating marginal revenue to its marginal cost. The theory further stated that profit maximization is the ultimate goal of the

organization as long as law and ethical custom are followed in the conduct of the organization’s business activities (McAleer 2003).

While Survival-Based theory on the other hand based its arguments on the survival of the fittest and explains that organizations must do everything legally possible to thrive, compete and survive (Dwyer et al. 2003). Survival-Based theory emphasizes that it’s normal for competitors to put in efforts to produce the fittest organization that adapts easily and is efficient. The theory assumes ruthless business rivalry supports the goal, which is legitimate survival (Lantos 2001). The application of the theory in the corporate turnaround of businesses is relevant till date, as ailing organizations usually face financial difficulties, loss of personnel, failing products, loss of market share, etc. An organisational resurgence may require reduction/layoff of its employees, cutting of salaries, selling of the organization’s under-capacity asset, repositioning their product to aid survival (Gössling et al. 2016). The primary aim of organizations is efficiency, flexibility, and profitability; these ensure survival (Coad et al. 2013). All measures adopted by firms, especially post COVID-19 outbreak supports these theories (profit-maximization and survival), hence, they are relevant.

Conceptual Framework and Hypotheses Development

Figure 1. COVID-19 and Factors Under Consideration



Source: Researchers’ (2020) as advanced by literature.

COVID-19 and Business Survival/Customer Retention

The COVID-19 pandemic has affected businesses as well as the stock market in Nigeria. The Nigerian stock market lost about NGN2.3 trillion (US\$5.9 billion) with possibility of further loss (Ozili and Arun 2020). Nigerian businesses were lost due to low patronage and sustained supply disruption (Nseobot et al. 2020).

Retaining customers is more difficult as orders from customers are at its lowest. A lot of experts and economic analysts have predicted a very glooming picture regarding business survival in Nigeria and the study done by (Ozili and Arun 2020) looks at COVID-19 and economic crisis, but the study did not look at the effect on businesses survival neither was the study domesticated within the Fast-Moving Consumer Goods (FMCG) sector in Nigeria. This necessitated the formulation of hypotheses one and two to see if COVID-19 has affected the possibility of business survival and customer retention within the FMCG sector.

Ho1: COVID-19 pandemic affect business survival in the FMCG sector

Ho2: COVID-19 pandemic through business survival have indirect impact on customer retention in the FMCG sector

COVID-19 and Firm Productivity/Business Survival

The FMCG industry in Nigeria has faced series of challenges overtime. The decline in consumer purchasing power due to the 2016 recession in Nigeria is an example. The FMCG industry was one of the major hit industries by COVID-19, compounded by Dollar inaccessibility and weak macroeconomic conditions (Ogunlela and Lekhanya 2016). Among the challenge faced by firms in the FMCG sector is the issue of disruption in all facets of the firm causing many firms to lay off staff or enforce a compulsory leave without pay (Nseobot et al. 2020). The pandemic's effect on firm's productivity in the FMCG industry is evident in production rate, indirectly affecting their market share. Some research has focused attention on COVID-19 and how it has affected some selected industry and general outlook of events in Nigeria (Teriba 2020, Açikgöz and Günay 2020), but none of the research is yet to really domesticate the study within the FMCG industry, a gap this study intends to fill. Hypothesis three examines business survival and firm productivity in the FMCG industry, and the effect of COVID-19.

Ho3: COVID-19 pandemic through business survival have indirect impact on firm loss of productivity in the FMCG sector

COVID-19 and Unemployment/Business Survival in the FMCG Sector

Unemployment is a major problem, especially in Nigeria and Africa as a whole. The government and private sector in Nigeria collaborate to tackle unemployment and create opportunities for the working age bracket. Unemployment can lead to increase in poverty, and the COVID-19 pandemic is already showing signs that the gain made fighting unemployment maybe undone (Akanle and Omotayo 2020). The study done by Adu et al. (2019) assessed unemployment situation at some selected industries in Nigeria, but the study did not include the FMCG sector. This informed the formulation of hypothesis four to x-ray the unemployment situation that maybe increased within the FMCG sector in Nigeria due to the COVID-19 pandemic.

Ho4: COVID-19 pandemic through business survival have indirect impact on unemployment/job loss in the FMCG sector

COVID-19 and Technology Adoption/Business Survival

The outbreak of the novel COVID-19 virus was unexpected. It necessitated a halt to most activities and a need to adopt other forms of engaging remotely to sustain economic activities to avoid total shut-down (Ting et al. 2020). COVID-19 forced information technology (IT) adoption for many firms and government establishments (Allam and Jones 2020). Adoption of technology became a must, increasing operational cost. Share value of online video platforms like Zoom, Microsoft teams, Skype etc., increased (Ting et al. 2020). Did COVID-19 force IT adoption across firm value chain or was it just a mere coincidence? Hypothesis five looks at COVID-19, technology adoption and business survival.

Ho5: COVID-19 pandemic through business survival have indirect impact on firm level of technology adoption in the FMCG sector

COVID-19 and the Nigeria Economy Outlook

Nigeria witnessed an economic crisis in 2009 caused by the global financial crisis, and 2016 caused by the sudden fall in the international oil price. Currently, the COVID-19 pandemic has affected price of crude oil, the major foreign currency earner for Nigeria. The difference in price of crude oil is already showing a major trouble for the Nigerian economy (Ozili and Arun 2020). Besides inadequate funds to support budget, business closure leads to a fall in taxes and income accruable to government (Nkengasong and Mankoula 2020). The study done by Nseobot et al. (2020) looks at the aftermath for businesses in Nigeria but did not highlight the effect of COVID-19 on Nigeria's economy and lessons from it. Hypothesis six investigates COVID-19 and Nigeria's economic outlook.

Ho6: COVID-19 pandemic contribute negatively to Nigeria's economy outlook

Methodology

The study is descriptive in nature because it employs both primary and secondary methods to gather the needed data to test hypotheses. Hypotheses one to five used responses from survey data, while hypothesis six used data from National Bureau of Statistics (NBS) and Central Bank of Nigeria (CBN) to examine the effect of COVID-19 pandemic on Nigeria economy. The study sample-size consists of twenty FMCG firms from among the total population of 35 recognised FMCG firms by Nigerian Stock Exchange (NSE). The justification for selecting 20 firms from the list of 35 recognised FMCG firms in Nigeria is to have a representative whole from among the list of recognised FMCG firms. Simple random and stratified sampling techniques were employed to select forty senior employees in each of the selected FMCG firm, making a total of eight-hundred senior employees

selected for sampling. Due to the COVID-19 pandemic that is restricting movement and causing social distancing, the questionnaire items were created in a google form and sent to the respondents (So et al. 2014). The data collation took up to four month (September to December 2020) for distribution and collation of data for this study. The justification for selecting senior level employees at each FMCG firms is to be able to assess the deep effects of the COVID-19 pandemic on business survival in Nigeria.

Instrumentation

Questionnaire items were adapted from literature; customer retention (Gustafsson et al. 2005), firm productivity (Buuri 2015, Leitão et al. 2019), unemployment (Arnout 2019), technology adoption (Ratchford and Barnhart 2012, Türker 2012), while questions on COVID-19 were adapted from (Caldera and Wirasinghe 2014, Udofia et al. 2020). To access the homogeneity and data adequacy before testing hypotheses using structural equation model (SEM), the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were employed. The study assessed the general reliability of the instrument by conducting a pilot study of one hundred respondents selected across ten FMCG firms and the result revealed 0.87 which is above the recommended threshold (Nunnally 1978). The justification for using SEM is the need of the study to test the causal relationship existing between measured, observed and latent variable in the study. Within the four month duration of the data collection, only six-hundred and seventy return rate was achieved (83.8% return rate) and was used for the analysis.

Table 1. Measurement Items

COVID-19 (COV)		
COV1	My country experienced positive tests of the novel COVID-19 virus	Udofia et al. (2020)
COV2	My country has never experienced a pandemic of this magnitude	Udofia et al. (2020)
COV3	The virus has disrupted my company supply chains services	Udofia et al. (2020)
COV4	The COVID-19 virus is present in all parts of the country	Caldera and Wirasinghe (2014)
COV5	COVID-19 virus has made a serious impact to the way we conduct business	Caldera and Wirasinghe (2014)
Firm Technology Adoption (FTA)		
SD1	We have fully embraced technology adoption into all the company value chain	Türker (2012)
SD2	The pandemic led to wide spread automation of performance and service delivery	Ratchford and Barnhart (2012)
SD3	I find it difficult to deliver effectively using technology	Türker (2012)
SD4	The overall performance of the company was affected due to working from home policy	Türker (2012)
SD5	I am more productive using technology to deliver work from home	Ratchford and Barnhart (2012)

Business Survival (BS)		
OP1	The company is facing a high financial challenge due to the pandemic	Bates (1995)
OP2	There is significant reduction in the production of goods and services due to the pandemic	Singh (2017)
OP3	We have recorded low sales and return as a results of low production in the past few months	Korunka et al. (2011)
OP4	We have had to lay off staffs to cushion the effects of the pandemic	Singh (2017)
OP5	We have had to reduce employees work hours per day to cushion salaries and or wages payment	Bates (1995)
Customer Retention (CR)		
CS1	We have remain consistent in retaining both new and current customers	Gustafsson et al. (2005)
CS2	Technology gives us the leverage we need to provide unwavering service needs to our consumers	Gustafsson et al. (2005)
CS3	Our effective online engagement has brought in more customers for the company	Vasic et al. (2019)
CS4	We struggle to retain customers during the pandemic	Chavez et al. (2016)
CS5	Our products and service demands skyrocketed during the lockdown	Vasic et al. (2019)
Unemployment (U)		
ORP1	The pandemic significantly reduced hours of jobs available	Furnham (1982)
ORP2	There is a mismatched between contemporary market needs and employees skill set	Furnham and Hesketh (1988)
ORP3	Inability of unemployed people to adapt to new working conditions	Feather (1990)
ORP4	There are lack of intelligence and ability among unemployed people	Furnham and Hesketh, (1988)
ORP5	Work from home strategy exposed many employees deficiency with regards to technology usage in the organization	Furnham (1982)
ORP6	There is a huge gap between the current job market realities and the educational system	Furnham and Hesketh, (1988)
ORP7	Low production capabilities result into loss of job opportunities	Feather (1990)

Data Analysis

Table 2. Demographics of the Respondents

		Frequenc y	Valid Percent	Cumulative %
Gender	Male	402	60.0	94.2
	Female	268	40.0	100
	Total	670	100	
Salary Range	Less than 5million per Annum	102	15.2	15.2
	5million-10million	383	57.2	72.4
	10million-15million	175	26.1	98.5
	15million & Above	10	1.5	100
	Total	670	100	
Highest qualification	BSc/HND	232	34.6	34.6
	MBA/MSc	300	44.8	79.4
	Postgraduate/Professional Certification	138	20.6	100
	Total	670	100	
Department	Production/ Supply chain	492	73.4	73.4
	Marketing & Sales	38	5.7	79.1
	Operations	140	20.9	100
	Total	670	100	

Assessing Multivariate Analysis Assumptions

In conducting structural equation model (SEM), assumptions of sample-size, normality, missing-values and multicollinearity were tested (Kline 2005). The recommended 200 sample size (Iacobucci 2010) was met given that the sample size used for this study is six hundred and seventy (670). To address normality, questionnaire items were assessed for skewness and kurtosis and the results were within the threshold of -1 to +1 (Amin et al. 2014). Frequency count revealed neither outlier nor missing values in the data set (Yana 2007). Multicollinearity was tested by correlation analysis. Correlation value above 0.5 is good (Field 2005), correlation for all the variable was above 0.5. Furthermore, we examine common method bias by looking at the second approach of Harman which is a more comprehensive and rigorous-technique (Podsakoff et al. 2003 and 2012) using CFA method. This was achieved by loading all twenty-five items used in the study into a single-factor using CFA. The result shows a poor fit as (chi-square=21.347, IFI=0.62, CFI=0.42, TLI=0.63, NFI=0.61, and RMSEA=0.24). Hence, the common method bias rule was not violated in this study.

Principal axis-factoring using EFA reduced redundant items and examined constructs loadings. Homogeneity was tested via Kaiser–Meyer–Olkin (KMO) and the Bartlett’s-test of sphericity (BTS), recommended values of acceptance are 0.05 and 0.000 respectively (Orçan and Yang 2016). The KMO results from the

EFA analysis is 0.828 and Bartlett’s-test of sphericity (BTS) is ($\chi^2=28155.593$, $p=0.000$, and <0.05). Homogeneity and data adequacy were achieved.

Table 3. Measurement Model

Measurement Items	Constructs	CFI	R ²	Mean	SD	Factor Loading	Cronbach Alpha	CR	AVE
FTA1	Firm Technology Adoption	0.911	0.331	4.18	0.921	0.772***	0.763	0.711	0.656
FTA2			0.555	4.06	0.992	0.786***			
FTA3			0.441	4.00	0.818	0.852***			
FTA4			0.540	3.75	0.995	0.779***			
FTA5			0.507	3.84	1.121	0.828***			
FTA6			2.383	3.93	1.174	0.895***			
COV1	COVID-19 Pandemic	0.924	0.411	4.00	1.034	0.773***	0.752	0.738	0.545
COV2			0.941	3.75	1.171	0.846***			
COV4			0.655	4.04	1.074	0.778***			
BS2	Business Survival	0.910	0.443	4.03	1.062	0.804***	0.833	0.728	0.603
BS6			0.373	3.87	1.067	0.744***			
U1	Unemployment	0.915	0.359	4.05	1.053	0.660***	0.810	0.721	0.745
U2			0.775	3.99	1.068	0.710***			
U3			0.289	4.12	0.992	0.662***			
U4			0.686	4.09	0.818	0.704***			
U5			0.557	3.84	1.071	0.884***			
U6			0.949	3.96	1.074	0.774***			
FP1	Firm Productivity	0.912	0.299	4.05	1.009	0.562***	0.833	0.803	0.632
FP2			0.419	3.77	1.068	0.614***			
FP4			0.992	3.64	1.097	0.784***			
FP5			0.301	4.05	0.983	0.811***			
CR1	Customer Retention	0.905	0.432	4.13	0.905	0.670***	0.810	0.710	0.650
CR2			0.996	3.97	1.021	0.750***			
CR3			0.464	4.09	0.935	0.692***			
CR4			0.564	4.07	1.191	0.650***			

Note: CR: Composite Reliability, AVE: Average Variance Extracted, CFI: Comparative fit indices, χ^2 : Chi-square Value.

Source: Field Survey, 2020.

A unidimensionality analysis was conducted to assess the fitness of the model for conducting SEM and the measures was assessed through composite reliability (CR), average variance extracted (AVE), Cronbach alpha, factor-loading, mean and standard deviation. The reliability of the construct was assessed using Cronbach-Alpha reliability technique and the results was above 0.70 as recommended by Nunally (1978) (see Table 1). The factor loadings for each of the twenty-one items have values greater than 0.5 as shown (see Table 1), hence, the data loaded very well and shows a good fit for the measurement model.

Comparative fit index (CFI) is used to assess whether the study model compare with the null-model supposing there are no correlations between the models constructs. As shown in (Table 2) the CFI value for all the constructs is greater than 0.90 and therefore shows a good fit for the measurement model (Bagozzi and Yi 2012). Hence, the CFI value shows acceptable model fitness. *Composite Reliability* is used to check the internal consistency of each constructs with regard to the variance from an observed variable from their latent factor. A composite reliability that is ≥ 0.70 has internal consistency, Table 1 shows all five constructs had consistency via higher values. AVE is the extent of the variance captured by a construct from the total amount of measurement error experience in

a model. Maravelakis (2019) puts the threshold at 0.50, and Table 1 shows non-violation. Hence, homogeneity was achieved for the model used to test the hypotheses stated in the study through SEM. Thirty-one items were subjected to CFA and only twenty-five items were deemed fit. Customer retention, business survival, firm productivity, and COVID-19 pandemic had (CR5), (BS2, BS4), (FP3) and (COV3, COV5) deleted respectively.

Table 4. Results of CFA

	χ^2	df	p	CFI	TLI	IFI	GFI	RMSEA
Measurement Model	2.328	290	0.000	0.915	0.903	0.920	0.911	0.06
Recommended Value	≤ 2 or 3		[1]	>0.9	>0.9	>0.9	>0.9	< 0.08

The model fit generally shows the comparative fit index (CFI=0.915), tucker lewis index (TLI=0.903), incremental fit index (IFI= 0.920), goodness of fit index (GFI=0.911), chi-square ($\chi^2=2.328$), degree of freedom (Df=290) and root mean square error of approximation (RMSEA=0.06), all of which shows that the model is above the recommended threshold for acceptance and is therefore fit to test the stated hypotheses see Table 2 (Nusair and Hua 2010, Hair et al. 2017).

Hypotheses Testing

Table 5. Path Model

Hypothesized Model	R ²	Standardized Effect	t-value	P-value	Remark
COV → BS	0.034	0.18 (DE)	3.679	0.000	positive and direct effect
COV → BS → FP	0.316	0.56 (IE)	11.919	0.000	positive and indirect effect
COV → BS → U	0.289	0.54 (IE)	14.075	0.000	positive and indirect effect
COV → BS → CR	0.088	-0.30 (IE)	-6.946	0.000	negative and indirect effect
COV → BS → FT	0.067	0.26 (IE)	6.274	0.000	positive and indirect effect

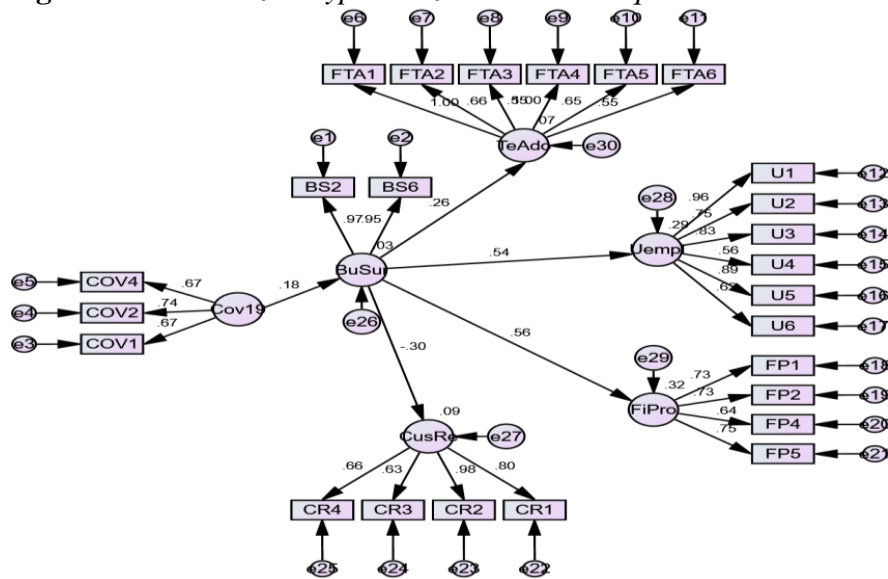
P<0.05; Where: DE=Direct Effect, IE=Indirect Effect, BS=Business Survival, FTA=Firm Technology, FP=Firm productivity, U=Unemployment, CR=Customer Retention, COV=COVID-19 Pandemic.

Six hypotheses were examined; however, the first five hypotheses were analysed using SEM and the direct, indirect, and standardized regression weights are shown in Figure 2. The sixth hypothesis was analyzed using a narrative discourse that compare the third and fourth quarter of 2019 to the first and second quarter of 2020 using secondary data that was derived from NBS and CBN in order to examine the impact of COVID-19 pandemic on the Nigerian economy outlook. The result from the SEM analysis shows that (H1) there is a direct relationship between COVID-19 pandemic and FMCG firms' performance (t-value=3.679 at p=0.005), therefore, the hypothesis was accepted. This means that the sudden occurrence of COVID-19 pandemic have adverse impact on business continuity and survival in the FMCG sector. The indirect hypotheses (H2 to H5)

examine the survival of businesses in the FMCG sector as a result of the impact of COVID-19 pandemic using firm performance measures such as firm productivity, unemployment, customer retention and firm technology adoption. The result shows that COVID-19 pandemic have indirect impact on all the performance measures used in the study and therefore, affect the operations of many organizations in the FMCG industry thereby determining the survival and or failure of this firms.

Although, the analysis shows a positive and indirect effect of COVID-19 pandemic on firm productivity, unemployment and firm technology adoption as the significant (t-value=11.919, 14.075 and 6.274 at p=0.05), making these hypotheses accepted. Hypothesis (H2) that examined the COVID-19 pandemic on customer retention and business survival of FMCGs show a negative, indirect, and significant effect (t-value=-6.946 at p=0.05). The significant impact therefore, make H2 to be accepted. The negative relationship could be as a result of the lockdown which make it difficult for organization and customers to have a consistent transactional relationship among each other's thereby forcing customers to look for alternative firms whose online presence is strong and can immediately satisfy theirs needs during the lockdown.

Figure 2. Standardized Hypothesized Structural Equation Model



H06: COVID-19 pandemic negatively impact Nigeria's economy outlook

The Nigerian economy outlook can be measured by the gross domestic product, inflation rate and interest rate (Bello and Aliyu 2016). However, the study used the GDP and inflation rate to measure the Nigerian economic outlook in order to assess the impact of COVID-19 pandemic on the Nigerian economy when compared to the preceding year 2019. This would highlight the extent of damage the pandemic has caused on the Nigerian economy and would ascertain the acceptance or rejection of H6.

Table 6. *Nigerian Economy Outlook 2019 and 2020*

GDP	2019 (%)	GDP	2020 (%)
(Quarter 1)	2.55	(Quarter 1)	1.87%
(Quarter 2)	1.87	(Quarter 2)	-6.10%
(Quarter 3)	-6.10	(Quarter 3)	-3.62%
(Quarter 4)	-3.62	(Quarter 4)	0.11%
Annual	2.27	Annual	-1.92
Inflation		Inflation	
August	11.02%	August	13.22%
September	11.24%	September	13.7%
October	11.61%	October	14.23%
November	11.85%	November	14.9%
December	11.98%	December	15.8%

Source: National Bureau of Statistics (2020).

The Nigerian GDP grew by 1.87% in the first quarter of 2020, this represents a decline when compared to the growth of 2.55% of 2019 4th quarter. The decline in GDP in 2020's 1st Quarter could be trace to halted international trading (National Bureau of Statistics 2020c, Adesoji and Simplice 2020). Similarly, the GDP in the second quarter experience a -6.10% decline as against the growth experienced in the preceding quarters. The third quarter also experienced a decline of 3.62% as against the preceding quarter. However, the fourth quarter shows a relief growth in the GDP with 0.11% and overall, put the GDP annual growth rate to a decline of 1.92 as against the preceding year. Hence, this decline shows the damage COVID-19 has had generally on the economic outlook of Nigeria.

Additionally, the Nigerian inflation rate shows that it has been increasing at an alarming rate from the last five month of 2019 through to the last five month of 2020. Although, the trend of these increase is consistent from the beginning of 2019 and therefore, cannot be categorically stated that the continuous increase in the year 2020 is as a result of the COVID-19 pandemic. However, given the annual decline in the GDP of Nigerian in 2020 (-1.92) amidst the global pandemic compare to the annual increase (2.27) experienced in 2019; then we can state that COVID-19 pandemic impact negatively the Nigerian economic outlook, thereby leading to the acceptance of the hypothesis.

Discussion

The study examined COVID-19 pandemic, business survival and FMCG firms' performance. Six hypotheses were examined, five hypotheses were analysed using SEM and the sixth hypothesis was analyzed using a narrative discourse. Among the five hypotheses (one direct and four indirect) examined with SEM; all the five hypotheses were supported. The study revealed that COVID-19 pandemic affected business survival in the FMCG industry due to compulsory lockdown by Nigerian government. This affirmed Bloomberg (2020a) report that businesses who are forced to lockdown face liquidation and survival challenge all over the world. Furthermore, findings revealed that COVID-19 pandemic exposed the level of

firm technology usage and their survival in the FMCG industry. This aligns with survival-based theory and profit maximization as any firm who could not produce at optimum capacity nor maximize profit risk the chance of surviving and thriving. The 21st century business environment of today is currently working at a pace where firm can hardly get anything done without full integration of technology into its operations. This is the reason why many firms struggle to meet customer needs online while other competitors leverage technology to meet existing and new customers' needs using technology (Mutlu et al. 2015). It is evident that many FMCG firms had minimal technology adoption across its value chain as revealed by the finding. Hence, firms need to comprehensively integrate IT into its value chain to mitigate uncertainties that could adversely affect performance (Mutlu et al. 2015) as this is seen as one of the contributions to knowledge for this study.

Findings also revealed that the COVID-19 pandemic affects unemployment rates and loss of jobs thereby affecting business survival in the FMCG industry. This finding aligns with reports by (International Labour Organization 2020, World Bank 2020a, Nkengasong and Mankoula 2020) that COVID-19 pandemic affects the unemployment rate in many countries leading to the loss of jobs and income. The findings support the theory of profit maximization and survival-based as all organizations are looking for the most effective ways to maximize profit, and hence, would do everything legally possible to keep the organization in operations. Since the finding of the study shows that COVID-19 pandemic affects business survival in the FMCG industry, it translates into more unemployment in the country (International Labour Organization 2020).

Furthermore, findings show that COVID-19 pandemic affects firm's productivity and business survival in the FMCG industry. Firms had to reduce their manpower and production schedule especially those regarded as essential product producers, complicating optimal performance. This effect on firm productivity will affect customer needs, supply, firm revenue and profitability (World Bank 2020b, Nkengasong and Mankoula 2020). This finding also aligns with the submission of profit maximization and survival-based theory as profit and survival can only be achieved when organizations produce at optimum capacity, otherwise, firms would look for every means possible to remain in business even if it means drastic manpower reduction.

Findings of the study show that COVID-19 pandemic has a significant negative indirect effect on customer retention and business survival. Developed nations contribute to citizens' welfare during the lockdown by providing basic household needs in order to curtail the spread of COVID-19 pandemic and restrict the urge of citizens wanting to go out of their house (Nkengasong and Mankoula 2020, Açıkgöz and Günay 2020). However, this is not the case in Nigeria as many citizens are left stranded without any provision for basic household's needs thereby making citizens to source for basic needs; hence, risking contact, exposure and the spread of COVID-19 pandemic. Thus, less physical and more virtual interface/engagement with customers must be implemented by firms to satisfy customers regardless of location (Mutlu et al. 2015).

Finally, findings showed that COVID-19 pandemic negatively affects the annual GDP of Nigeria's making the economy outlook to experience (-1.92%)

decline as against the preceding year. This is not surprising given the halt to international trading and lockdown experienced by businesses across the country. COVID-19 pandemic affected 60% of the global-oil-prices and given the reliance of the country economy on oil revenue, then it is certain that the GDP will be adversely affected (National Bureau of Statistics 2020c). Also, the finding shows that as the country GDP is experiencing decline, inflation rate is also increasing at an alarming rate making the country currency to experience a major setback in valuation when compared to foreign currency such as dollar (\$) (Nkengasong and Mankoula 2020, Nseobot et al. 2020).

Implications

COVID-19 pandemic brought a new normal to business operations all over the world and especially FMCG firms and has been able to expose organizations directly and indirectly to their various weaknesses with regards to their operational flexibility, technology adoption and readiness to accept change as imposed by both internal and external pressures in the business environment (Michie 2020, Nkengasong and Mankoula 2020). The current business environment is dynamic and multifaceted, elevating uncertainty. Thus, IT integration to value chain operations is pivotal to customer satisfaction, retention and business survival.

Furthermore, the study revealed that COVID-19 pandemic affected jobs, firm productivity, and unemployment rate in Nigeria (and the world). Though, many countries and especially developed ones are supporting corporations to cushion the effect of COVID-19 pandemic. Hence, the government needs to also support FMCG firms in Nigeria to survive the effect of COVID-19 pandemic in order to manage job loss (Gössling et al. 2020). The study found a negative indirect relationship through COVID-19 pandemic and customer retention and business survival in the FMCG industry. COVID-19 pandemic exposed the weakness of many firms to re-assessing the level at which they can remotely attend to customer needs and keep customer engaged in the organization using technology. The world is changing so fast and this has made many firms to move from traditional means of engaging customers to digital means (Dadzie et al. 2017). Thus, firms who are able to survive the pandemic have to fully adopt digital content marketing communication strategy and fully integrate technology into firm value chains in order to keep firm customers engaged, satisfied and retained (Dadzie et al. 2017, Mutlu et al. 2015).

Furthermore, FMCG firms in Nigeria may also need to adopt pay per hours of work rather than monthly salary (9am to 7pm of work) as is the usual practice FMCG firms and other industry. This would enable firms to reduce the number of hours that all employees can work in a day in order to give opportunity to everyone thereby reducing the unemployment and hardship situation in the country especially as the pandemic as worsened for everyone (Açikgöz and Günay 2020, Allam and Jones 2020). Finally, finding also shows that COVID-19 pandemic has adverse effect on the Nigerian economy outlook considering the decline in GDP and continuous increase in the country's inflation rate. This has triggered

continuous borrowing from other country in order to survive and avoid incessant recession, hardship and unemployment as worsened by the COVID-19 pandemic (Michie 2020).

Conclusion

COVID-19 has become a global phenomenon ravaging the entire globe and also a serious concern to various Businesses, Government and individuals at various levels. This paper examines the COVID-19 pandemic and business survival as a mediation on the performance of FMCG firms. Plus, the general economic outlook in the face of the COVID-19 pandemic. The study showed that there is a direct impact between COVID-19 pandemic and survival of businesses, firm productivity, unemployment, customer retention and firm technology adoption in the FMCG industry. Findings also show a drop in the growth of the Nigeria GDP when examining the Nigeria economic outlook through the pandemic. This is as a result of halt in local production, international trading due to the compulsory lockdown of the economy to mitigate the impact and spread of the pandemic, although, major breakthrough has been recorded in the creation of vaccines across countries (UK, USA and Russia, among others) to mitigate the further spread of this virus and if possible to eradicate its existence across countries (Wang and Tu 2020, Liang and Litscher 2020). However, this study emphasise a serious need for workable policy frameworks and economic reforms by the Nigerian government to ensure the economy is revived and set on the path of growth and development towards reducing unemployment and the burden of job-loss. They also need to create avenue for businesses to thrive/survive in the country and create a means to prevent total economic collapse due to the COVID-19 pandemic especially in the FMCG sector.

Suggestions for Further Research

The study examined COVID-19 pandemic and business survival as a mediation on performance of FMCG firms. The study was able to recover only six hundred and seventy employee responses from the selected FMCG firms. Further research can be done on the same subject with a larger sample size. Also, the study focuses specifically on the impact of COVID-19 pandemic on the survival of FMCG firms, further research can extend to other industries to establish a holistic view of the effect of COVID-19 pandemic on the Nigerian economy and provide further insight to the future of business operations. Further research can also be done to look at a comparative impact of COVID-19 pandemic on business survival and performance in develop and developing economies. The findings would serve as guide to government especially in developing economies about the importance of supporting firms and building a sustainable and conducive business environment.

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Working Capital Management and Systems Disruption during the COVID-19 Pandemic: Evidence from South Africa

Miemie Struwig & Storm Watson

This study provides a critical analysis of working capital management (WCM) research in South Africa during the COVID-19 pandemic. The COVID-19 pandemic has disrupted every aspect of human life, from health to the economic system. Businesses need to respond swiftly to the extreme changes, and adopt a proactive approach to working capital, to ensure a greater chance of successfully overcoming the many challenges. This research uses five stages to investigate WCM research and critically analyses and proposes ways to deal with WCM during each stage. The first stage deals with the global recession of 2008 and thereafter. The second involves managing working capital during the pandemic; thirdly during extreme change; and fourthly post-pandemic. It concludes with managing working capital in the new economic order. Samples of research outputs for each stage were used for critical analysis through a systematic analysis process. The results show that research into WCM after the 2008 global recession mostly focused on how businesses could mitigate the impact of the crisis itself and buffer themselves against future crises. During pandemics, there are three key steps that should be considered by management teams who seek to stabilise their cash positions. When experiencing extreme changes, such as economic downturns and sudden demand or supply shocks, businesses need to cushion them. Post pandemic working capital research focus is on demand volatility and workforce safety. Finally, in a new economic order, digital transformation shifts as well as effective cash management necessary to alleviate volatile supply chains, are important. The global coronavirus pandemic has produced a humanitarian crisis unlike anything before, with sudden and dramatic disruptions across all industries and markets. This research produces some insight into how to manage the short-term finances of a business during these phases.

Keywords: *working capital management, systematic review, COVID-19 pandemic, extreme change, new economic order*

Introduction

The coronavirus disease of 2019 (COVID-19) pandemic has disrupted every aspect of human life, from health to the economic system. Businesses need to respond swiftly to the extreme changes and adopt a proactive approach to working capital to ensure a greater chance of successfully overcoming the many challenges. This study provides a critical analysis of working capital management (WCM) research in South Africa during the COVID-19 pandemic. Efficient WCM involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet short-term obligations, whilst also avoiding excessive investment in assets at the same time.

On the economic front, COVID-19 has acted as an accelerant of major trends already in progress. Policymakers can only make assumptions about the different paths that the future could take, based on the economic theories at their disposal (Kapoor and Dasher 2020).

The global coronavirus pandemic has produced a humanitarian crisis unlike anything experienced before, with sudden and dramatic disruptions across all industries and markets. Businesses must respond moment-to-moment as they receive insights with each news cycle. They must also be prepared to act swiftly and aggressively to counter each disruption and protect their most valuable assets, whilst anticipating unpredictable future changes.

To ensure business continuity during the economic downturn, businesses are looking to optimise their cash management and working capital processes. The purpose of this article is thus to critically analyse WCM research to identify ways in which business can manage their working capital during the pandemic.

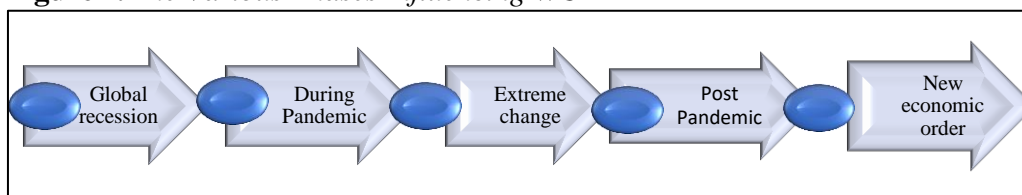
Literature Overview

Management of working capital is important for the success of any business (Louw et al. 2019, p. 3, Kwenda and Holden 2014, p. 569). The adequacy of current assets, together with their efficient handling, influence the survival of the business and, as such, they are vital to the effective running of the business (Ismail 2017, p. 12, Kasozi 2017, p. 337).

Working capital deals with the short-term financing of the business; that is current assets and current liabilities. It is thus a measure of the liquidity of the business. The goal of effective WCM is to ensure that a business has adequate and ready access to funds necessary for day-to-day operating expenses, whilst also ensuring that assets are invested in the most productive way (Norton et al. 2011).

There are five phases that have influenced WCM during the past decade, as demonstrated in Figure 1, and these are discussed in the following paragraphs.

Figure 1. *The Various Phases Influencing WCM*



Source: Own compilation.

Phase 1: The Global Recession

The 2008 financial crisis was the worst economic disaster since the Great Depression of 1929 (Kosakowski 2017). The root cause of the financial crisis cannot be traced to one single event or reason. Rather, it resulted through a sequence of events, each with its own triggering mechanism that led to near collapse of the

global banking system. The lack of efficient and effective WCM possibly played a role in nearly all of these events.

Van Wyk et al. (2015) found that the financial crisis of 2008 exposed critical failures in the analysis and understanding of the South African financial system. The crisis influenced global and local regulators and policymakers to focus on addressing the vulnerabilities in the financial system. Van Wyk et al. (2015) further found that the vulnerabilities stemmed from reliance on short-term wholesale funding, excessive leverage, liquidity traps, balance sheet mismatches, interconnectedness and opacity.

Madubeko (2010) argues that South Africa has been defined by many scholars as the economic powerhouse of Africa, leading the continent in terms of industrial output and mineral resource production. South Africa also boasts rich natural resources, well-developed commodities and a stock exchange that can compete with the best in the world (Madubeko 2010).

Akinsola (2016) identifies that the financial crisis affected the consumption and spending of consumers, which led to consumers being more dependent on loans and increasing debts. This led to an increase in non-performing loans, which are “loans that are a past debt that is unpaid in the present and unpaid for more than 90 days from date that debt or loan was incurred” (Akinsola 2016).

The critical failures exposed during the 2008 financial crisis caused a surge in research in the following years as scholars attempted to understand the financial system and to propose ideas on how to minimise the possibility of another financial crisis of this magnitude.

Phase 2: During Pandemic

Overall, the pandemic has caused a rethink of economic institutions and mankind’s approach towards the environment. Hence, it has also propelled a reimagination of the role of the market and the State. Society may come out of this catastrophe with some positive changes, but it may also set in motion some negative practices (Zimon and Tarighi 2021, p. 2). The task for nations would be to navigate these opportunities and challenges, and this may herald the beginning of a new economic order.

The COVID-19 pandemic has highlighted ineffective ways in which businesses manage working capital. As a result, there were calls for a greater emphasis on the management of WCM during extreme changes (such as during pandemics), and in the new economic order which the World is facing.

Phase 3: Extreme Change

Goldsworthy and McFarland (2018) explain that the phrase “extreme change” refers to not only a disruptive change, but also to any form of one or more large scale, complex, change efforts that test the ability of the business to respond. Krell (2020) equates extreme change to occurrences such as economic downturns and sudden demand or supply shocks. Managing extreme change entails more than simply surviving change. It entails developing the ability to adapt to change over

time as well as learning how to deal with an uncertain future (Goldsworthy and McFarland 2018).

Phase 4: Post Pandemic

COVID-19 has a clear short-term impact. Almost every aspect of commerce has been impacted, from global supply chains to financial markets. Finance functions have had to rapidly evolve in order to keep up with the rate of change (Fenton 2020). However, thriving beyond the “now” necessitates accepting the rapid speed with which this need to transform must be met.

While the impact on one nation’s economy can have a resounding impact on other nations, the impact of the pandemic on each nation individually has had a manifold impact on the global economy at large. Therefore, no past financial crises can adequately guide and predict the post-pandemic economy (Kapoor and Dasher 2020). Nevertheless, financial crises in the past signalled a fundamental change in economic thinking. The post-World War 2 economic thinking was largely inspired by John Maynard Keynes’ general theory (Kwenda 2014). Post-pandemic economic thinking will need to undergo a similar fundamental change.

Phase 5: New Economic Order

The new economic order seeks the restructuring of the pattern of international trade and the flow of capital and technology, among others, so that their benefits could be more equitably distributed to the developing countries (Chukwu 2018).

The COVID-19 pandemic has highlighted errors in the manner in which businesses managed working capital and, as a result, there were calls for a greater emphasis to be placed on the management of working capital management during extreme changes, during pandemics and in the new economic order with which the globe is being faced.

These phases as shown in Figure 1 will be used to critically analyse WCM research in South Africa.

Methodology

The aim of the study was to identify pointers for current businesses to manage their working capital.

Critical analysis of business research investigated WCM during five phases, namely:

- Global recession and thereafter.
- During the pandemic.
- Extreme change.
- Post Pandemic.
- New Economic order.

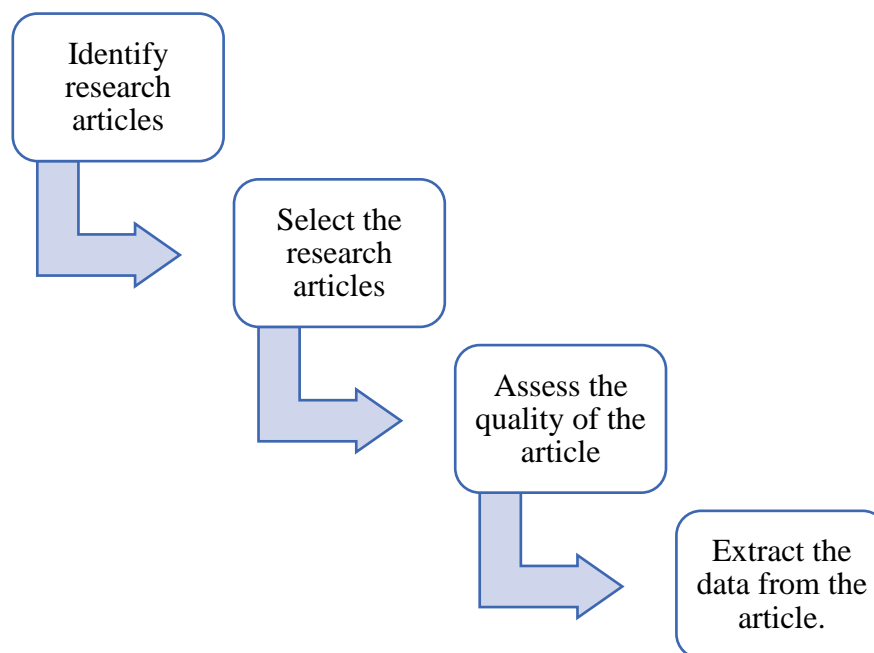
Business research articles during these five phases were critically analysed and reviewed. An inductive data analysis technique was used to show the purpose and main findings of during the different phases.

The following steps were followed in the research design.

- Identify research articles. Three online databases were searched to find relevant articles using specific search words and criteria.
- Selecting the research articles. From eighty articles extracted only fourteen were found to be useful to the study.
- Assessing the quality of the article. The quality of the studies was determined by analysing the abstracts and citations.
- Extracting the data from the article. Data relevant to the study was extracted in a structured and logical manner.

The steps outlined are illustrated in Figure 2.

Figure 2. *Steps in the Research Design*



Source: Authors' own compilation.

Fourteen research outputs were used in the review and were sorted according to one of the five phases identified in literature. These were then critically analysed to produce the results. Table 1 outlines the number of research outputs that were critically analysed for each of the phases.

Table 1. *The Number of Research Outputs that Were Critically Analysed in Each of the Phases*

Phase	Number of outputs critically analysed
Phase 1: Global recession	4
Phase 2: During Pandemic	3
Phase 3: Extreme change	3
Phase 4: Post Pandemic	2
Phase 5: New Economic order	2
Total	14

Source: From results of the survey.

Results

Results of WCM During Global Recession and Thereafter

Since the dawn of the 2008 global financial crisis and worldwide economic depression, research into WCM has increased substantially, involving involved debates between financial managers and academics in the field regarding the correct method of managing a business's working capital (Kayani et al. 2019, p. 353, Singh and Kumar 2013, p. 174).

In South Africa, financial managers have focused on reducing their investment in inventory and trade receivables to ensure that working capital levels reflected the new economic reality (Oseifuah 2018, p. 3). Various businesses such as Barloworld, New Clicks and AECI generated positive cash flows amounting to billions of Rands as a result of reducing their investment into working capital (Correia 2019, p. 11). During the economy recovery between 2010 and 2013, businesses increased their investment in working capital. However, between 2016 and 2018, as the South African economy experienced low economic growth and a difficult operating environment, businesses again put their focus on reducing investments in working capital in an attempt to curb the lower demand and generate positive cash flow (Correia 2019, p. 11).

Louw et al. (2016, p. 546) found that the impact of WCM on financial performance, specifically related to profitability and liquidity, has been the subject of numerous studies. Louw et al. (2016, p. 546) noted that the increase in competition amongst businesses has caused extraordinary pressure on profit margins in a time when business failures tend to increase, and this has resulted in the need for a new perspective on WCM in businesses.

Research into WCM after the 2008 global recession mostly focused on how businesses could mitigate the impact of the crisis itself and buffer themselves against future crises. Some of the most noteworthy research outputs, and Van Wyk et al.'s (2015) findings are outlined in Table 2.

Table 2. *Research Conducted into WCM After the 2008 Global Recession*

Author/s	Purpose	Findings
Simon et al. (2017)	To evaluate investments in WCM during and after the financial crisis of 2007-2008 to examine the effect of financial crisis on WCM and the performance of firms in Nigeria.	Investment in WCM was significantly affected during the financial crisis, which consequently led to low performance.
Haron and Nomran (2016)	To evaluate the determinants of WCM before, during and after the global financial crisis of 2007-2008, using 57 Malaysian firms.	Profitability, debt, sales and firm size significantly affected WCM before and during the financial crisis of 2008.
Ramiah et al. (2014)	To document the measures taken by Australian corporate treasurers in the areas of cash, inventory, accounts receivable, accounts payable and risk management to survive the global financial crisis.	More than half of the participants in the survey altered their WCM practices during the crisis. Capital expenditure was curtailed, as they aimed at preserving their cash levels while reducing inventory levels. Credit worthiness of institutions became more important, and there was a general decline in credit availability. Australian working capital managers exhibited behavioural biases, particularly overconfidence.
Oseifuah (2018)	To analyse the effect of the 2008/2009 global financial crisis on the nexus in South Africa between WCM and its separate components (inventory conversion period (ICP), receivables conversion period (RCP) and payables deferral period (PDP) and profitability) of a sample of 75 non-financial firms listed on the JSE over the 10-year period (2003 to 2012).	A significant negative relationship existed between RCP and profitability during the financial crisis only. The relationships between profitability and cash conversion cycle, and profitability and ICP, were negative. The relationship between profitability and PDP was positive. However, none of these relationships were significant.

Source: Author's own compilation.

Results of WCM during a Pandemic

According to the World Health Organisation (WHO 2020), a pandemic is defined as “an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people.”

The COVID-19 pandemic is different to the pandemics of the past, due to the level of interconnectedness of the global economy. This pandemic has triggered unprecedented restrictions not only on the movement of people, but also on a range of economic activities, even leading to declarations of national emergencies

in most countries in Europe, North America and Africa (Chang et al. 2020). This pandemic is disrupting global supply chains and international trade. More than hundred countries have closed their international borders during the months of March to August 2020, which has caused the movement of people and tourism to come to a stop (Chang et al. 2020). Millions of people in these countries are facing job loss. To avoid a sharp slowdown in their economies, governments around the world are considering and implementing massive stimulus programs, which could potentially plunge the global economy into a deep recession (Wojcik and Ioannou 2020).

The negative consequences of prolonged economic restrictions in developed countries would also spread to developing countries across trade and investment networks. Consumer spending in the European Union and the United States is expected to fall sharply, reducing imports of consumer goods from developing countries. Furthermore, global manufacturing output could decrease as a result of extended disruptions to global supply chains (United Nations 2020).

Bruna and Depoix (2020) indicated that businesses needed to adopt a proactive approach to working capital to ensure a greater chance of successfully overcoming the many challenges. Bruna and Depoix (2020) further propose that businesses need to focus on their cash availability and, as such, create an accounts payable and accounts receivables checklist. These checklists indicate that businesses need to extend payment terms, eradicate early payments, and shut down unnecessary supply to obtain quick account payable cash release benefits. These checklists also indicate that it is imperative to intensify invoicing, cash collection, and dispute management to accelerate the cash inflow, while enhancing credit risk management activities to secure client payments due. All the actions in these checklists are designed to create awareness amongst the employee base about the importance of a secured and stable cash inflow.

PwC (2020) identified that, based on network experience in working with businesses, governments and regulators during other worldwide pandemics including Ebola, MERS, SARS and the bird flu, that there are three key steps that should be considered by management teams who seek to stabilise their cash position. These steps include:

- a) Rapidly understand the current financial situation: Depending on the severity of the situation, an assessment of available and trapped cash may need to be made in a matter of weeks or days as responding quickly is essential.
- b) Take action to protect the position: Once clarity on the cash position has been obtained, the directors and management teams should take immediate action to ensure they can (at a minimum) maintain this position, alongside identifying opportunities to access new money, if required.
- c) Manage internal and external stakeholders: Alongside steps 1 and 2, organisations will need to quickly understand who their key stakeholders are (internally and externally). Management of stakeholders can often be challenging in a stressed scenario, particularly where interest is conflicting and there are significant demands for real-time information.

Results of WCM during Extreme Change

Goldsworthy and McFarland (2018) explain that the phrase “extreme change” refers to not only to a disruptive change, but also to any form of large scale, complex, change effort (or a series of them) that challenge the ability of the business to respond. Managing extreme change means more than surviving change once. It means developing the ability to get better at change over time and learning how to get better at managing an uncertain future.

The rationale behind managing WCM during extreme change is to avoid potential financial difficulties. Poor WCM may lead to financial distress, which increases the risk of bankruptcy. When businesses are faced with extreme change, they may be in either inevitable distress or approaching bankruptcy. In this situation, WCM becomes of interest to banks and legal advisors (Ramiah et al. 2014). Banks tend to rely on working capital data to decide whether they can offer additional business loans, whereas legal advisors use it to determine whether a business is legally bankrupt. Working capital is a proportion of the shareholder’s funds and is a common way to free-up cash when needed (Smart and Megginson 2009, p. 652). Therefore, effectively managing working capital during extreme change is of critical importance (Brigham and Daves 2010, p. 719).

Krell (2020) highlighted a study of WCM best practises, which identified several improvements businesses can consider in order to cushion the impact of extreme change. These include:

- Aligning WCM processes with corporate strategy.
- Cultivating cross-functional engagement.
- Identifying relevant drivers, and related metrics, for WCM value and risk.
- Deploying supporting technology to increase efficiency and support process improvements.
- Continuously improving capability.

Results of WCM Post COVID-19

Schwartzkopf (2020) finds that businesses, both during and post COVID-19, will have to respond to the impacts of the global pandemic in an impassive way to ensure that they can emerge from it. Bruna and Depoix (2020) identify that businesses and individuals are experiencing demand volatility, with a clear example being the overdemand for food and household products that is affecting everyone worldwide. Additionally, businesses are hampered by revenue reductions, such as those imposed by government guidelines on store closures that severely affect all sectors of the economy, and in particular the retail sector. Businesses are additionally being faced with necessary investments to ensure workforce safety, to include increased cleaning services, hard to source hand sanitiser and cleaning products, as well as major investment in communications technology to support the millions of employees working from home (Schwartzkopf 2020).

Results of WCM in a New Economic Order

Dorsman and Westerman (2019, p. 43) stated that working capital management is an “evergreen”. However, it is not always understood as being that important for businesses, since it is concerned with “just” short-term financing issues. Nevertheless, working capital programmes are next to long-term asset and financing programmes crucial to a business’s value creation. Other than the latter, their efficiency directly translates into business performance, especially in harsh economic times, such as those faced by many businesses during the financial crisis, pandemic and the new economic order (Zeidan and Shapir 2017).

The following are possible guidelines (adapted from PwC 2020) that businesses can follow to ensure that they succeed in the new economic order post COVID-19:

- Consider accelerating digital transformations as the shift to remote working reveals gaps in IT infrastructure, workforce planning and digital upskilling.
- Protect growth and profitability through actions such as scenario planning, more frequent financial modelling exercises to improve resiliency, and new models that incorporate economic impacts of past pandemics.
- Understand customers through longer-term considerations around shifts in core markets or business models as a result of the pandemic.
- Effectively manage cash taxes, obtain available refunds and consider local government and tax authority measures in response to COVID-19.
- Consider taking steps to stabilize supply chains when preparing for a volatile sales and profit mix in key markets.
- Assess the company resources to meet ongoing indirect and direct tax compliance requirements.
- Explore opportunities focused on becoming more flexible in responding to arising uncertainties.

Discussion

Considering the results of the critical analysis, if businesses would like to maximize working capital efficiency, they need to:

- Build a sense of cross-functional ownership by bringing teams together with a common objective and bring cash to the forefront of decision-making.
- Eliminate internal barriers of competing metrics that could be driving the wrong behaviours or taking focus away from cash.
- Get accurate information internally, and from suppliers and customers, as close to real-time as possible.
- Think about the financial health of the supply base and set the right payment terms for the right category of suppliers.

- Keep a tight hold on what payment term extensions the business is willing to negotiate. Be sure that finance can calculate the impact to avoid unfortunate surprises.
- During a time of incredible disruption, take the opportunity to reassess priorities.

Limitations and Future Research

The search strategy for this study was limited to three databases and 14 academic outputs were used in the study. This search strategy limited the publications included in the dataset. However, these outputs provided valuable trends and directions. There is limited information on how business should protect their working capital during tough economic times. Future research on what financial managers can do to lessen the impact of change on business is needed. Research is also needed to assist in creating policy frameworks for the government on how they could support business to survive extreme changes whilst maintaining the integrity of the economy.

Conclusion

Governments around the world are considering and rolling out large stimulus packages to avert the sharp downturn of their economies, which could potentially plunge the global economy into a deep recession. The adverse effects of prolonged restrictions on economic activities in developed countries are spilling over to developing countries via trade and investment channels.

The COVID-19 pandemic, and resulting economic crises, has left businesses grappling with the challenge of ensuring continuity while working remotely, accessing short-term liquidity, and supporting supply chains. In the absence of appropriate WCM practises, businesses often will fail. This statement implies that accurately managed WCM policies are essential for a business's survival. Therefore, as it is important to have a balance between profitability and liquidity, practitioners should scrutinise working capital if they want to avoid the likelihood of their businesses failing.

The COVID-19 pandemic, which reached its peak of the second wave in South Africa during this study, has highlighted aspects in the manner which businesses manage working capital. As a result, there have been calls for greater emphasis to be placed on the management of working capital during extreme changes, during pandemics and in the new economic order the World is facing.

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Topics on Tourism

The Impact of the COVID-19 Pandemic on Greek Tourism

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This paper examines the economic impact of the 2020 pandemic on international Greek tourism receipts. The uncertainty and risk surrounding the epidemiological conditions make any reliable prognosis of the 2020 and beyond almost impossible. This study relies on information regarding the international pre-bookings of European destinations. According to the European Union's Travel and Tourism Industry, pre-booking have fallen by 60 to 90 percent. Using these two extreme values and the average of the two, this study develops three scenarios to examine the impact of the pandemic on Greek tourism. In the best of the three scenarios, the contribution of Greek tourism to GDP will drop from 16% to 6.6%. The output loss amounts to €16.8 billion.

Keywords: *pandemic, COVID-19, crisis, tourism, Greece, economic impact*

Introduction

In 2019, 34 million tourists arrived in Greece from different countries generating €18.2 billion of international tourist receipts. These were historical record numbers for the Greek tourism industry. In addition, 2020 looked even brighter till the pandemic outbreak mid-March in Greece. The lethal infectious disease (Covid-19) hit the Asian countries first and then spread out to Europe and eventually to the rest of the world. Almost all countries banned international travel. The Greek tourism market collapsed as did all the tourism markets in the world and especially in Europe.

Greece belongs to the European Union and is a member of the Eurozone since its inception in 2002. Regrettably for all those who believe in the so-called European Project, the European Union's reaction to the current pandemic has been far-fetched. There was a complete lack of co-ordination and each member state has been applying its own policies violating the principle of the freedom of movement of goods and people.

The recent (13 May 2020)¹ releases of a series of documents adopted by the European Commission demonstrate the weakness of the most important European Institution to take a strong position on the issue and most importantly coordinate their actions. By a strong position, I mean evidence-based criteria to be applied by the countries concerned. For example, if the daily number of people infected is below 10 for 14 days (the minimum time required to recuperate from the disease), then this country can be declared pandemic free. Travel between such countries should be allowed. The European Commission made a number of proposals which do not address the problem in practical business-like terms. They wish that international travel is permitted if the epidemiological situation improves. But how

¹See European Commission (2020a, 2020b, 2020c, 2020d).

does one define improvement? And under what conditions such travels will be permitted? In this paper, I do provide some evidence what it could be meant by improvement.

Pandemics in economics are analysed as external shocks similar to other events such as earthquakes, floods, droughts, wars, terrorist attacks etc. A recent short overview is given by Rasul (2020). Theoretical and empirical studies of pandemics have shown mixed results even though most of them point towards an overall negative effect; in the short, medium and long run. Some of these studies are briefly reviewed in the next section of the paper. The most important constraint of economic impact analyses of previous pandemics is the availability of data. This explains why most economic impact studies use the 1918 epidemic and other smaller outbreaks of the 20th and 21st century as their natural experiments to examine economic impacts. On the other hand, the social and political impacts are easier to assess because there are references made to them. The first well known epidemic of 430 BCE narrated by Thucydides in his work of the Peloponnesian War (Papanikos 2020) has a detailed exposition of the social, political and anthropological effects of the plague. Unlike Pericles, Thucydides himself was infected and survived.

The current COVID-19 pandemic has a particularity when is compared with the 1918 epidemic; never before people travelled so much for business, education and recreational (pleasure) purposes. The travel industry in 2020 cannot compare to what this was in 1918; almost non-existent. The pandemic hit badly damaged the tourism industry by completely shutting down the supply and the demand of tourism services. It can be thought of as a market failure to satisfy a potential demand. But there is more than that. It is not economics that determine the outcome of the tourism market but epidemiology. It is not the invisible hand of the market but the invisible virus of the coronavirus. This explains the difficulty in providing forecasts of the economic impact of the pandemic on the tourism market even if one asks the Oracle of Delphi (i.e., applying the Delphi Method); economics play little or no role at all. The existence or not of the market is determined by the harshness of the pandemic which create enormous uncertainty and uncalculated risks.

Despite all these deficiencies, this paper attempts to estimate the impact of the current pandemic on the international Greek tourism market. The literature review looks to shed some light on the possible effects on the aggregate economy and the tourism market in particular. An eclectic review of this literature is given in the next section of the paper. Some leading indicators of the pre-booking cancellation are used to develop three possible scenarios. These are examined in the third section of the paper. The most important determinant of the tourism impact is the lift of the lockdown -conditionally or unconditionally. The fourth section look at this issue using data of the number of people infected in 19 countries which constitute the most important earning source (two-thirds) of total international Greek tourism receipts. The last section of the paper concludes.

The Impact of Pandemics in an Historical Context

Lack of data restricts economic impact analyses of pandemics. Papanikos (2020) examined the famous ancient plague narrated by Thucydides and made a comparison with the synchronous pandemic of 2020. The comparison was made in terms of individual, social and political effects. Data are not available to make an economic impact analysis. In addition, the co-existence of a war and a plague makes the impact evaluation of the ancient Athenian plague very difficult indeed. This might also be the case of the 1918 epidemic because occurred immediately after the First World War if not during the war.

A number of studies had been published before the outbreak of the synchronous pandemic which attempted to assess the economic impact of a pandemic. All of these studies suffer from methodological problems which are mainly the result of lack of data and have been recognized by authors themselves. These studies use a rule of thumb methodology, back of the envelope calculations and anecdotal evidence to measure the economic impact. Despite all these problems their estimates seem to be comparable with what current research has provided for the synchronous pandemic. Studies have measured the overall economic impact of more recent pandemics. Eichenbaum et al. (2020) developed a theoretical epidemiology model to study the impact of the synchronous pandemic. The best policy is containment which increases the severity of the recession but according to their benchmark estimates 500 thousand lives would be saved in the USA. However, this study does not measure the lives lost if the reduction in economic growth has a negative impact in infant mortality.

Meltzer et al. (1999) estimated the possible effects of a hypothetical influenza pandemic in the United States. They used death rates, hospitalization data, and outpatient visits. They reported estimations of 89,000 to 207,000 deaths; 314,000 to 734,000 hospitalizations; 18 to 42 million outpatient visits; and 20 to 47 million additional illnesses. Their estimated economic impact was between 0.7 and 1.7 percent of GDP. Jordà et al. (2020) studied 15 major pandemics going back to 14th century by looking at the rates of return on assets. They found persistent negative after-effects that lasted for about 40 years. Interestingly, they found a positive effect of wars. Ma et al. (2020) used panel data of 210 countries for the 1960-2018 period. They observed a 2.57 percent negative impact on real GDP. Policy interventions early on had a mitigated effect on the reduction of economic growth. Most studies take advantage of data availability of the 1918-1920 epidemic (so called the Spanish Flu). Barro et al. (2020) looked at this epidemic using data from 43 countries. For an average country, they found an economic contraction of 6 to 8 percent. Garrett (2007) also examined the 1918-1920 epidemic. Recognizing the lack of economic data, the study relied on anecdotal evidence and print media to assess the economic impact of the epidemic. The author, in his opening paragraph, stated that “The possibility of a worldwide influenza pandemic (e.g., the avian flu) in the near future is of growing concern for many countries around the globe.”

The author used influenza mortalities in the Cities in the Eighth District States of the USA. The economic impact is based on anecdotal evidence of print media. They do, however, provide useful information. Here is a compilation. “Merchants

in Little Rock say their business has declined 40 percent. Others estimate the decrease at 70 percent.” “The retail grocery business has been reduced by one-third.” “One department store, which has a business of \$15,000 daily (\$200,265 in 2006 dollars), is not doing more than half that.” “The only business in Little Rock in which there has been an increase in activity is the drug store. Fifty percent decrease in production reported by coal mine operators.” These numbers look similar to the effects of the current pandemic reports. For example, these are about the same estimates of OECD (2020) for the current pandemic impact on tourism.

Garrett (2007) observed that cities and states having greater influenza mortalities experienced a greater increase in manufacturing wage growth over the period 1914 to 1919. This is because the capital-labor ratio increased due to the higher mortality rate. The author concluded that

“Society as a whole recovered from the 1918 influenza quickly, but individuals who were affected by the influenza had their lives changed forever. Given our highly mobile and connected society, any future influenza pandemic is likely to be more severe in its reach, and perhaps in its virulence, than the 1918 influenza despite improvements in health care over the past 90 years. Perhaps lessons learned from the past can help mitigate the severity of any future pandemic.”

Many other studies have studied the economic impact of the 1918 epidemic with mixed results. Studies found positive long-term impacts. Brainerd and Siegler (2003) model the 1918 epidemic as an exogenous shock to the USA economy. They used data from 1919 to 1930. They controlled for a number of factors such as initial income, density, urbanization, human capital, climate, the sectoral composition of output, geography, and the legacy of slavery. They found a robust positive effect of the 1918 epidemic on per capita income across states during the period under investigation. Almond (2006) used the 1918 epidemic as a data generation process of a natural experiment to test the fetal origins hypothesis. He found that fetal health affected almost all socioeconomic groups recorded in the 1960, 1970, and 1980 Censuses. Those who were in utero during the epidemic of 1918 and their mothers were infected; they had a 15 percent lower probability to finish high school. Also, men’s wages were 5 to 9 percent lower. Correia et al. (2020) used geographic variations in mortality rates of the 1918 epidemic in the USA. They found that manufacturing output decreased by 18 percent which was the result of the co-movements of both the supply and demand. They also looked at government intervention initiatives at the city level. Cities which intervene earlier and more aggressively had better economic performance and they grew faster after the epidemic was over.

World Bank (2017) published a report with estimates of GDP loss during a pandemic. They used a methodology based on the study of Fan et al. (2015). As far as Greece is concerned, the World Bank estimated that the loss would amount to 0.44 percent of its GDP. The Global effect was estimated to be 0.7 percent of GDP.

It remains to be seen what the final impact of from the Covid-19 2020 pandemic will be and previous studied may not necessarily be the best guide. In a case study of Sierra Leone of the 2014-16 Ebola outbreak, Bandiera et al. (2018) found a decrease in income of 10.9 percent. The government actions were identical

to the measures taken by many governments to cope with the 2020 pandemic: (a) lockdowns and travel bans, (b) all schools were closed and (c) there was a mobilization to record cases and track contagion. These have had dire effects on economic activity; especially the travel bans and the lockdown of shops had devastated effect on tourism. This has been the Greek case which is examined next.

The Greek Tourism Market Under the Pandemic

The literature on pandemics suggests that the short-run impacts are considerable but the long term ones are more positive. The economic textbook circular flow assumes that suppliers (businesses) and households freely interact in the factor and product market incurring the relevant costs and generating revenues. Any intervention by an external agency (e.g., government, trade union, employees' associations) or contingency (e.g., a war, a terrorist attack, an earthquake) have an impact on the demand and supply of the final product (e.g., recreational tourism services) and all the intermediate products and factors of production required to produce the final product. Applying this to tourism, economists using their analytical tools can estimate the effect of any intervention on the demand and supply side of tourism services.

However, the current situation of the pandemic's impact on the supply and demand of tourism services cannot be analysed using the traditional tools of economic analysis. The impact of the pandemic cannot be analysed as an external shock. This is normally done when a negative external shock impinges on the supply and demand of a product (e.g., hotel services), or the demand and supply of an entire economic sector (e.g., tourism industry) or on the aggregate economy.

The 2020 pandemic impact is different. Its effect cannot be measured as a shift of the demand and/or supply curves because simply these curves do not exist. For example, due to the coronavirus, there is neither supply nor demand for tourism services. When the coronavirus closes a hotel, the service of this hotel does not exist anymore. When a country forbids its citizens to travel abroad, this is not a shock on the demand curve (the demand curve does not shift to the left) but the demand collapses, i.e., it does not exist anymore. There is a potential demand but this cannot be realized under a situation of uncertainty and risk that a pandemic creates. Thus, there is no economic policy that can solve this problem when for medical and institutional reasons the market is forced to shut down its operation on both the supply and the demand side. That is an economic policy which can open up the market by removing the barriers to trade.

It is not an economic problem; it is a medical (epidemiological) problem which has serious economic and social repercussions including the entire process of sustainable development and tourism². It is the subject matter of infectiology.

²The effect of the COVID-19 crisis on tourism and sustainable development is examined in Jones and Comfort (2020). The authors offer an excellent recent overview of the relationship between tourism and sustainable development and conclude with some policy and research suggestions at the level of government and business. Prudently so they emphasize that their paper is not an empirical one because of the uncertainty involved. The key issue is when the pandemic will be terminated and

Economists cannot forecast the impact till the infectiology will determine when the circular flow of the tourism market can be set in operation again. Until the Covid-19 pandemic runs its course—and the conditional or unconditional opening of the market begins to take place, economic analyses may have limited value. Conditional means that the terms of trade will change which will result in an increase in costs. Then economists can be useful; at the extreme what is epidemiologically or politically feasible may not be economically operational and there will be a market failure because of the constraints imposed on it.

What is optimal from a medical point of view in air travel (e.g., 40 percent capacity) may be prohibited from an economic point of view because such capacity rates do not cover the fixed cost of operation. And the economic textbook has a dismal prognosis of what happens to the business in such situations. In the Greek context of so many small islands and small hotels³, strict recommendations as the ones proposed by the European Commission in its recent documents exclude many small Greek destinations. For example, they recommend full-fledge hospital and medical facilities. The numerous small touristic islands have serious problems of providing basic health services in normal (non-epidemic) situations. If such restrictions are imposed, the small islands tourism markets will collapse. Their hotels can open to satisfy any demand.

The economic impact of a closed market is very simple to estimate. The impact on the Greek tourism of a closed market in 2020 is equal to the tourism multiplier (e.g., 1.6) multiplied by tourism receipts⁴. If we assume that the international tourism receipts would have remained the same as in 2019 without the pandemic, then in the second quarter of the 2020, Greece will forego international tourism receipts of 5 billion euro⁵. If they stay closed for the rest of 2020, then the foregone international tourism income would be 17.4 billion euro. Thus, the direct effect will be 17.4 billion euro and the total effect $17.4 \times 1.6 = 27.9$ billion euro or 15 percent of the Gross Domestic Product (GDP). And this does not take into consideration the domestic tourism which is not small either.

According to estimates reported by the European Commission (2020a, p. 9)

“...revenue losses at European level have reached 50% for hotels and restaurants, 85% for tour operators and travel agencies, 85% for long-distance rail and 90% for cruises and airlines. EU travel and tourism industry reports a reduction of bookings in the range of 60% to 90%, compared to the corresponding periods in previous years. The crisis has hit SMEs the hardest: lacking liquidity and facing uncertainty, they struggle to stay afloat, access funding and maintain their employees and talent.”

Households face uncertainty and risk as well. Even if the lockdown is lifted tomorrow, the uncertainty and the risk will remain and this will affect the demand

so far, this does not look very promising.

³I have examined elsewhere in detail the economics and the employment of Greek Hotel Enterprises at the aggregate and regional level; see Papanikos (2000, 2001, 2002).

⁴See European Commission (2020a, pp. 7-8). They give an average tourism multiplier of 1.56 for all the European Union. For Greece, is a little bit higher.

⁵Tourism data is retrieved from *The Border Survey* conducted and reported by Bank of Greece (<https://www.bankofgreece.gr/en/statistics/external-sector/balance-of-payments/travel-services>).

for tourism and especially international tourism. To be fair, the European Commission has recognized this important aspect of the tourism market and has outlined measures and guidelines which can reduce the uncertainty and risk by disseminating in real time all available information using the modern information technology and communications. But this may have the opposite effect. When the consumer is informed (he will receive a message in real time) that where he plans to travel (a small Greek island) there is a case of someone being infected, then he would think twice before taking the trip. Once on the island, if he receives such a message, all tourists would want to get out as soon as possible. Under such circumstances, Greek tourism will suffer not this year only. And this will interrupt an unprecedented tourism growth in the last two decades. Table 1 shows the recent history of international Greek tourism in terms of receipts and arrivals⁶. As a percentage of GDP, international tourism receipts increased their GDP share from 5 percent in 2005 to almost 10 percent in 2019. Both GDP and tourism receipts are expressed in nominal terms. Thus, comparisons overtime can be made only using the percentage of tourism receipts to GDP.

Table 1. International Tourism Arrivals and Receipts, 2005-2019

Year	Int'l Tourism Receipts Billion €	Int'l Tourism Arrivals Millions of Tourists	Spending per Tourist Arrival €	GDP Billion €	Tourism Receipt as a % of GDP
2005	10.73	14.39	746	199.2	5.39%
2006	11.36	15.23	746	217.9	5.21%
2007	11.32	16.17	700	232.7	4.86%
2008	11.64	15.94	730	242.0	4.81%
2009	10.40	14.91	697	237.5	4.38%
2010	9.61	15.01	640	226.0	4.25%
2011	10.50	16.43	639	207.0	5.07%
2012	10.44	16.95	616	191.2	5.46%
2013	12.15	20.11	604	180.7	6.73%
2014	13.39	24.27	552	178.7	7.50%
2015	14.13	26.11	541	177.3	7.97%
2016	13.21	28.07	470	176.5	7.48%
2017	14.63	30.16	485	180.2	8.12%
2018	16.09	33.07	486	184.7	8.71%
2019	18.18	34.00	535	187.5	9.70%

Data Source: GDP (AMECO). International Tourism Receipts (Bank of Greece).

This past positive history of international tourism receipts will surely come to an end in 2020. Unfortunately, it is very difficult to foresee the economic impact of a pandemic in general and on tourism in particular. Everything depends on the epidemiological variables. The key question is the termination of the pandemic. Once this is determined, then a process of recuperating starts which results to an increasing rate of economic growth. The empirical evidence is mixed on this issue and there seems to be both transitory and permanent effects. In some cases, the

⁶I have examined these in detail in my book on Greek tourism receipts; see Papanikos (2005).

effect might be a strong positive one if the economy does not suffer losses of its productive human capital. But even if it suffers such a loss, the negative effect is mitigated by an increase in the capital-labour ratio.

In this study, I use the leading indicators provided by the early bookings for tourism destinations. According to the European Commission report (cited previously), the European Union’s travel and tourism industry has experienced a reduction in tourism bookings in the range of 60 percent to 90 percent. These reductions include cancellation of many events such as conferences, festivals, cruises, etc., which have been permanently cancelled. In Greece almost all summer sports, cultural and educational events have been cancelled or postponed. These events attract hundreds of thousands of people.

I assume that the pandemic had a very small (5 percent) impact in the first quarter of 2020. I then make three scenarios of an overall reduction of 90 percent, 75 percent and 60 percent. The estimates are shown in Table 2. Three scenarios are reported assuming (a) a reduction of 90 percent which implies that only 10 percent of tourism receipts will be made relative to 2019; (b) a reduction of 75 percent and (c) a reduction of 60 percent. The latter is the best-case scenario. Alternatively, one could envisage scenarios that the reduction rate of 90 percent is reduced throughout the rest of the 2020 but the critical issue is when the lockdown will end. This is a situation of uncertainty and not one of risk.

Table 2. *The Pandemic Impact on Greek Tourism: A Scenario Analysis*

	2019 Actual (€M)	Coef. A	2020 Scenario A (worst case)	Coef. B	2020 Scenario B (average)	Coef. C	2020 Scenario C (optimistic)
Q1	747	0.95	709	0.95	709	0.95	709
Q2	4667	0.1	467	0.25	1167	0.4	1867
Q3	10693	0.1	1069	0.25	2673	0.4	4277
Q4	2072	0.1	207	0.25	518	0.4	829
Total (Year)	18179		2452		5067		7682
% of 2019			13.5%		27.9%		42.3%
% Reduction			86.5%		72.1%		57.7%
GDP Impact	29086		3924		8108		12291
% of GDP Impact	16%		2.1%		4.3%		6.6%

In 2019, international tourism receipts amounted to a total of 18.2 billion euro but more than half (59 percent) of these were realized in the third quarter of the year; 26 percent in the second quarter; and 11 percent in the last quarter. Only 4 percent of the receipts were made in the first quarter of 2019. Assuming that these proportions will remain the same in 2020 -the seasonality of Greek Tourism is one of its permanent features-, the impact of the pandemic on the tourism receipts can

be estimated using the range of the fall of pre-booking of 60 percent to 90 percent. These result to three impact coefficients of 0.1 in the worst-case scenario, 0.25 in an average scenario and 0.4 in an optimistic scenario.

In the worst-case scenario the overall decrease in tourism receipts is 86.5 percent relative to 2019. From 18.2 billion, receipts will decrease to 2.5 billion. Assuming a multiplier effect of 1.6, then the impact on Greek GDP is a reduction of 13.9 percent relative to 2019 (16 percent-2.1 percent). In 2019 the international tourism contribution to GDP was €29.1 billion (16 percent) while it is expected to be only €3.9 billion in 2020 if the worse-case scenario is realized (2.1 percent of GDP). That said, as many studies have shown of previous pandemics, the overall GDP impact depends on how strong and how fast is the government intervention. In the case of Greece, government reacted quickly providing income to employees and liquidity to employers who were affected by the lockdown. The best-case scenario still assumes a considerable reduction in tourism receipts; from €18.2 billion in 2019 to €7.7 billion. The loss of output relative to 2019 is €16.8 billion (29.1-12.3). In this optimistic scenario the tourism contribution to Greek GDP is 6.6 percent as opposed to 16 percent in 2019.

Predicting the Lockdown Lift

When should countries lift the lockdown? This is a very difficult decision to make and the European Commission does not provide any criteria for the lifting of the lockdown on international tourism. Rather, it vaguely refers to a better epidemiological situation. How should a critical situation be defined? What is the threshold between lifting and not lifting the lockdown? But what are the cost and benefits of a lockdown? How should they be measured? Do they add up arithmetically or geometrically? Does the lockdown costs only a reduction of economic growth (loss of GDP) or it costs lives as well? How do we evaluate the loss of lives due to coronavirus against the loss of human lives due to a reduction in economic growth? The relationships between economic growth and health variables such as longevity and mortality rate (especially infant mortality) have been well documented in the theoretical and empirical economic literature; see among many others the studies by Niu and Melenberg (2014), Hanewald (2011), Swift (2011), and Kalemli-Ozcan (2002). The causality may run both ways. An initial increase in income or per capita income or its distribution may positively affect longevity and quality of health, which, in turn, through its human capital effect may increase per capita GDP. If tourism enhances human capital -this is the case when recreation and leisure activities are considered a necessity-, this results in future raises of the productivity of labour.

In conclusion of this literature, the trade-off may be evaluated in terms of human lives lost and saved. If a slowdown of economic growth due to the lockdown increases infant mortality and the coronavirus increases the mortality rate of elderly with underlying chronic medical problems, what is the optimal size of a lockdown in terms of its length of time and width of economic activities

covered? These issues have not been addressed in the current debate of the lockdown due to COVID-19. But they are important.

If a country aims at eliminating the risk of spreading the disease, then it should lift its travel bans only when at least the 14-days moving average of the reported cases of the country of origin is zero. This does not eliminate the risk because the number of reported cases is an underestimation of the true cases; the latter include people who are infected but they show no symptoms. Another indicator would be the number of deaths but this can be an overestimation because people with underlying chronic diseases should be excluded. I give the following real example. An old woman of 93 years old with bad medical history died due to the coronavirus in Athens. Her death made headlines. The same day a young male of 30 years old without any health problem died in a traffic accident. His death hardly made it through the news. From an economic point of view, the two deaths are not two more numbers. Even from a compassionate point of view the two deaths do not carry the same weight. This appears to be the case with the synchronous pandemic. Health economists have developed their own methodology in evaluating the value of lives lost.

Table 3. *Reported New Cases of COVID-19 Infections (14-Days Moving Average) and Tourism Receipts by the Most Important Countries of Origin*

Country	Receipts €M	% of Total Receipts	As of 15 May, 2020 (14-days MA)
Germany	2959	16.3%	1002
United Kingdom	2564	14.1%	3978
USA	1189	6.5%	22517
France	1090	6.0%	745
Italy	1009	5.5%	1119
Netherlands	534	2.9%	264
Romania	483	2.7%	263
Cyprus	465	2.6%	4
Switzerland	462	2.5%	54
Austria	462	2.5%	39
Belgium	453	2.5%	375
Russia	433	2.4%	9913
Australia	371	2.0%	18
Canada	343	1.9%	1441
Sweden	258	1.4%	504
Albania	212	1.2%	8
Spain	203	1.1%	1023
Denmark	191	1.0%	100
Czech Republic	184	1.0%	44
Total	13864	76.3%	2285

Note: Data on Covid-19 infections was retrieved from the online database maintained by the John Hopkins University (<https://coronavirus.jhu.edu/map.html>).

If the country accepts non-zero cases, then a threshold can be established. Table 3 reports data on Greek International Tourism receipts by top countries of

origin. In total these countries made up the 76 percent of total Greek international tourism receipts. Germany is at the top with almost €3 billion in 2019 followed by U.K. and USA. Which markets opens depends on the thresholds imposed by the home and the destination country. Suppose Greece imposes a restriction that no tourists can visit Greece coming from countries that in the last 14-days had a nonzero average of new cases. This is met only if in the last 14 days, the country did not report a single case. It is obvious from Table 3 that no country meets this criterion as of 15 May 2020 and it is not going to satisfy this criterion by the end of May as well.

If Greece imposes a 14-days moving average of less than one thousand, then many countries will be excluded such as Germany, USA, UK, Italy and Spain. Of course, this criterion must be combined with the rate of increase. It must be negative otherwise there is always the risk of a second wave (spike) which many epidemiologists expect to happen by the end of the summer. In this case the criterion is enhanced to include the rate of decrease of the spread of the disease. Thus, Greek tourist authorities must take some difficult decisions, especially when deciding to open up the island tourism market which so far have had zero cases of infected people. Some islands such as Crete, Rhodes and Corfu have a well-developed hospital sector and they can deal with an emergency situation but the other islands do not have such facilities. However, the risks may be-even higher if the epidemiological protocols are followed. Assume that in a small island of Greece a tourist tests positive to COVID-19. As normal tourists do, he visited all the places of the small islands (e.g., museums, beaches, bars, restaurants etc.) and got in conduct with many tourists and locals. The entire island must be put on quarantine for at least 14 days. Very few will risk such a vacation experience.

Unless the pandemic is over, such risks impose nonzero economic and social costs. And as such they will considerably reduce the international and national demand for tourism. The tourism market will start returning to its pre-pandemic years only if the 14-days moving average is reduced to zero. And even then, some months or even years may be required before the uncertainty and the risks are eliminated. Tourism for recreational purposes cannot co-exist with the fear of an infectious disease. Actually, it cannot exist with any fear such as wars, earthquakes, political unrest, climate changes etc.

Conclusion

The economic impact of any pandemic is very difficult to measure including the number of people contracting the virus and dying. The review of the literature shows that the effects (positive and negative) can be immediate due to lockdown, medium due to time required to adjust to a pre-pandemic state and long-run through its effect on human capital which might last more than one generation as this has been demonstrated by the empirical verification of the fetal origins hypothesis. Based on the leading indicators of pre-bookings this study has found that the impact of the 2020 pandemic on international Greek tourism receipts is huge. The effect on GDP is expected to be unprecedented for a non-war period.

Even the economic crisis that hit the Greek economy hard cannot compare with the impact of the COVID-19 on the Greek economy. Tourism receipts reductions are expected to have an impact that ranges from 9 to 14 percent of GDP. And this is the 2020 impact. Unless the uncertainty and risk are eliminated (measured by zero cases in the last 14-days) the tourism impact will continue to exert a big strain on economic resources. Government interventions by spending public money to support household and small business proprietors' income cannot be sustained for a long period of time.

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A Review of the UK's Tourism Recovery Plans Post COVID-19

Peter Jones

The COVID-19 pandemic has wreaked global economic havoc and disrupted the lives of the majority of the world's population, and many governments have pursued a wide range of measures to stimulate economic and social recovery. In June 2021 the UK government published a tourism recovery plan, which set out the role that it hopes to play in assisting and accelerating the tourism sector's recovery from COVID-19 and a framework for how the government will work with the sector to rebuild and revitalise tourism within the UK. This paper focuses on this plan, and includes a short literature review, a summary of the plan, and some concluding reflections.

Keywords: *COVID-19, recovery plan, tourism sector, UK government*

Introduction

The COVID-19 pandemic has wreaked global economic havoc and disrupted the lives of the majority of the world's population, and many governments have pursued a wide range of measures to stimulate economic and social recovery. The tourism industry has been particularly severely hit by the pandemic, and the United Nations World Tourist Organisation (2021), for example, argued that "tourism is one of the sectors most affected by the COVID-19 pandemic, impacting economies, livelihoods, public services and opportunities on all continents", and that "all parts of its vast value-chain have been affected". In a similar vein, Pangetsu (2021) argued that "tourism is among the industries that have been hit hardest by the COVID-19 crisis", that "over a year since the onset of the pandemic, the numbers are staggering: Tourism destinations recorded one billion fewer international arrivals in 2020 than in 2019", and that "100 to 120 million tourism jobs were put at risk, a large proportion in small and medium-sized enterprises". At the national level, governments have looked to boost their nations' tourist industries, on the one hand by economy-wide stimulus packages, and on the other by tourism specific measures. A number of European governments including Spain, Ireland, Greece, and the Netherlands have introduced tourism recovery plans, designed to build a more resilient tourist economy post COVID-19.

Tourism is a major element in the UK's economy, it includes tourist visitors from other countries and domestic tourism, and it embraces a wide variety of activities and business enterprises including international, national and local travel, hotel and accommodation services, food and beverages, sport and recreational activity, tourism attractions and products, exhibitions, conferences, cultural activities, and a wide range of retail outlets. The COVID-19 pandemic severely affected all the elements of the UK's tourism industry, not least because of the range of government measures to tackle the spread of the virus, including the introduction of restrictions on overseas travel, of social distancing and lockdown, and of the

closure of a number of types of shops and hospitality venues, and also because of many people's reluctance to travel. By way of two summary illustrations, the Office for National Statistics (2021) estimated that overseas residents made 73% less visits to the UK in 2020 than in 2019, and Visit Britain Visit England (2021) estimated that domestic tourist spending in 2020 was 63% lower than in 2019.

The UK Government has pursued a wide range of measures to support the tourism, hospitality and leisure industries. In producing a briefing on the impact of the COVID-19 pandemic on the tourist industry for the House of Lords, Newson (2021), for example, catalogued a range of measures including, £12 billion from the COVID-19 job retention scheme, £5 billion in bounceback loans, a temporary reduction in Value Added Tax for hospitality, accommodation and attractions, funding to support communities that depend heavily on tourism, and funding to help destination management organisations deemed to be at severe risk of closure. More strategically, in June 2021, the UK Government published "The Tourism Recovery Plan" (Department for Digital, Culture, Media & Sport 2021). This plan "sets out the role that the UK government will play in assisting and accelerating the tourism sector's recovery from COVID-19", and "it also sets out a framework for how the government will work with the sector to build back better" (Department for Digital, Culture, Media & Sport 2021).

Literature Review

The COVID-19 pandemic has, without doubt, been the biggest, and the most damaging, issue for the tourist industry in the past two years and, not surprisingly, plans, initiatives, and strategies designed to respond to the pandemic, and to support the recovery of the tourism industry have attracted considerable attention in the academic hospitality literature. The aim here is to offer some illustrative examples of this literature, to reference and provide some academic context for this paper. Sharma et al. (2021), for example, proposed a resilience-based framework for reviving the global tourism industry post COVID-19. More specifically, this framework outlined "four prominent factors for building resilience in the industry", namely "government response, technology innovation, local belongingness, and consumer and employee confidence", and Sharma et al. (2021) rather optimistically argued that by that using such inclusive resilience, "the tourism industry may transform into a new global economic order characterized by sustainable tourism, society's well-being, climate action, and the involvement of local communities".

Sigala (2020) reviewed past and emerging literature in an attempt to better help professionals and researchers understand, manage, and valorize both the tourism impacts and the transformational affordance of COVID-19. In conclusion Sigala (2020) argued that "the COVID-19 pandemic has created a fertile new context that could stimulate research which may have valuable end-user benefits. A wide range of transformational opportunities are identified, including developing greater understanding of how the attitudes of tourists that have been exposed to their own, or others", COVID-19 travel traumas, may influence future travel attitudes and intentions, and may also help the tourism industry to reimagine and create an

operating environment that is human-centred and that incorporates sustainability and well-being values.

Kuscer et al. (2021) looked to explore how different countries and destinations responded to the initial impact of the COVID-19 pandemic, in the belief that such an approach might help in choosing the right path by addressing the negative, and taking advantage of the positive, repercussions. The research emphasised the importance not only of government interventions and stimulus packages for destinations to enable them to tackle the COVID-19 crisis, but also of developing resilience and sustainability as integral elements in recovery strategies. Further, it was argued that resilience management can only be developed using a participative process that involves all stakeholders, and that enhancements in destination-wide management of employees, quality management, digitalisation, internal communication, and support for tourism businesses, are all essential in developing resilient tourism destinations.

Pardo and Ladeiras (2020) employed a series of virtual forums to explore the perceptions of travel and tourism experts, drawn from across the globe, of how the COVID-19 pandemic was influencing regional or national tourism activity, and of how they were preparing for the recovery of tourism. The authors identified a number of pillars that should be a priority for tourism authorities, including smart specialisation, enhanced tourism intelligence, new governance, digital skills, and greater cooperation. In addressing smart specialisation, for example, Pardo and Ladeiras (2020) argued that while cultural and natural resources are unique elements with the potential to attract visitors, in an increasingly competitive tourism market, it will be necessary to design and introduce novel experiences, and that investing in smart specialisation in tourism makes sound economic sense. Here the argument is that differentiation comes from unique, authentic, indigenous resources, ideally, exclusive to a particular area, where they can be a more permanent contributory factor to long-term tourism success.

Khalid et al. (2021) investigated if the size of a country's tourism sector influenced the economic policy response to the COVID-19 pandemic, and their findings revealed that the more important the tourism sector, the larger the economic stimulus package introduced by governments. Further, the authors suggested that a more targeted economic package may be required in countries where the travel and tourism sector is an major part of the overall economy, and argued that such countries should look to support the domestic tourism sector, to serve as a buffer for the industry as a whole, because it will easier to kick start compared to the international tourism sector.

Some of the research on responses to the COVID-19 pandemic has focused on specific countries, but a number of general implications can often be identified. Collins- Kreiner and Ram (2021), for example, looked to outline national COVID-19 exit strategies and to analyse recovery strategies in seven countries, namely Australia, Austria, Brazil, China, Israel, Italy and Japan. The authors concluded that all counties were implementing tactical measures to contend with the crisis as part of their national tourism policies, but that there was little evidence that countries had formalised comprehensive exit strategies and plans for the tourism sector. At the same time, Collins-Kreiner and Ram (2021) also emphasised that no

single policy or strategy is appropriate for all countries. While this is seen to be understandable in that each country has its own unique set of tourism attractions, and in that the pandemic has affected different countries in different ways, the authors argued that without international commitment to sustainable tourism, the sector will not become more resilient and better prepared for future crises.

Zhang et al. (2021) argued that the effect of the COVID-19 pandemic had rendered forecasts of tourism demand in Hong Kong obsolete, but that such forecasting was a fundamental step in the recovery process, as it informs decisions about the appropriate phases of action. With this in mind, they explored combining econometric and judgmental methods to forecast possible paths to tourism recovery. More specifically, the authors used autoregressive correction models to generate baseline forecasts, and Delphi adjustments to evaluate the economic effects of the pandemic on the tourism industry. In outlining the implications of their work, Zhang et al. (2021) suggested that due to the uncertainty and volatility of the COVID-19 pandemic, tourism recovery should involve a gradual process and the rebranding of destination imagery would be a critical factor in domestic and short-haul market recovery.

Rogerson and Rogerson (2021) recognised that the tourism sector in South Africa had experienced the scale and the devastating impact of the COVID-19 pandemic, that this would reshape existing patterns of tourism, and that understanding these changes was essential in designing appropriate policy interventions. The authors stressed the importance of domestic tourism in the recovery process and here, and by way of conclusion, they made a number of recommendations. They argued, for example, that there were opportunities not only to address the uneven geographical spread of tourism, because in the wake of COVID-19, many tourists would seek out less crowded places, but also to market natural open space, tranquillity, and seclusion to potential domestic tourists.

Planning for Recovery

In introducing the framework for “The Tourism Recovery Plan”, the UK government rightly recognised that “COVID-19 will continue to present challenges and uncertainties to the tourism sector for some time”, but that it “wants to see a growing, dynamic and sustainable tourism sector reaching its full potential and driving growth in every nation and region of the UK” (Department for Digital, Culture, Media & Sport 2021). By way of introduction, the plan emphasised that the UK’s tourist industry was a national asset, that the UK was a world leading tourist destination, and that an important part of the UK’s attraction was that it had something for everyone. At the same time, the government also recognised that the UK’s tourist industry must be seen in its wider international context and that in the wake of the COVID-19 pandemic, attracting tourists back and retaining tourist markets, will be fiercely competitive.

The government’s goal in drawing up its tourism recovery plan is “to build on the UK’s position as one of the most effective tourist destinations in the world and to enhance the UK’s offer even further by effectively showcasing and marketing

the country's tourist assets" (Department for Digital, Culture, Media & Sport 2021). This overall goal was distilled down into a number of short to medium term objectives, which included to help to see a swift return to 2019 levels of tourism activity and visitor expenditure, the sharing of tourism benefits to all parts of the UK, a tourism industry that contributes to the enhancement and conservation of the country's cultural, natural and historic heritage, a tourism industry that is inclusive and accessible to all, and for the UK to be the leading European nation for hosting business exhibitions and conferences.

These objectives are certainly ambitious and there is an explicit recognition that they will not be achieved overnight, and that, as such, the plan is seen as the first steps towards recovery. Here the first priorities are to reopen safely and profitably, by taking "a scientific and evidence-based approach to restarting both business tourism and inbound/domestic tourism"; to support businesses; and to stimulate demand (Department for Digital, Culture, Media & Sport 2021). Here, the government recognises the importance of working in partnership both across government departments and with a wide range of private sector organisations, and argues that the British Tourist Authority and the National Tourism Board will lead much of the recovery.

Stimulating demand is identified as a major challenge, and while there is a clear recognition not only that demand has been artificially suppressed by restrictions put in place in an attempt to control the virus, but also that many people have become risk averse to protect themselves and others. On the domestic side, the plan catalogued a number of financial packages, including a £5 million marketing campaign, £10 million for the British Tourist Authority to deliver consumer promotions to support the tourism industry, a scheme to pursue the development of domestic rail tourism, and the launch of a refreshed version of the Countryside Code to encourage people to enjoy the countryside safely and respectfully. The recovery plan also emphasises the need to drive demand back to large cities, such as Manchester and Coventry and also on supporting recovery in London.

The plan acknowledges the vital role that international tourism will have to play in tourism recovery, but it also suggests that the return of inbound tourism will be slower than that of domestic tourism, and that the competition for inbound tourism will be fierce. While the government argues that the success of its vaccine programme will provide a competitive advantage, the plan lists a number of initiatives designed to consolidate that advantage. Here, marketing campaigns will look not only to respond to changes in consumer behavior in the wake of the pandemic, not least the perceived demand for experiential travel, but also to ensure that the UK is well represented overseas. At the same time, the government affirmed its commitment to support the country's assets that draw in both international and domestic tourists in new ways, for example, by raising awareness of the rich variety of food and drink cultures throughout the UK.

In addressing "Building Back Better", the recovery plan sets out "how the UK government will work with and support the tourism sector to build back better from this pandemic", and here the emphasis is a "more innovative, data-driven, accessible and resilient tourism -with less reliance on the peak season" and on

developing “a thriving tourism sector which is able to attract, train and retain a more skilled workforce all year round” (Department for Digital, Culture, Media and Sport 2021). Geographically, the government is looking to spread the benefits of tourism development throughout the UK, and particularly to less well-known attractions and destinations.

More specifically the recovery plan emphasises the importance of investing in local visitor economies, of having a solid structural foundation for tourism, and of the importance of investing in transport to underpin the country’s tourism industry. In addressing investment in local visitor economies, a wide variety of existing funding sources, including support packages both for towns and their High Streets, for community renewal, and for coastal communities, were cataloged in the recovery plan. The plan also stresses the importance of having a solid foundation for tourism and reported that work was underway on the best way to structure and support Destination Management Organisations supporting, and driving, local, regional and national tourism in England. This review reported in August 2021 (de Bois 2021) and made a number of recommendations to support Destination Management Organisations undertaking a wide range of activities that combine “to ensure their destination remains sustainable, competitive and compelling”.

Transport is highlighted as having a vital role to play in underpinning the success of the tourism industry. Here, the recovery plan reports that the government is working on a strategic framework for the aviation sector, which will include consideration of the workforce, skills, regional connectivity, regulation, consumers, and a number of environmental issues, while looking to ensure that growth is consistent with the UK’s carbon budget and with targets for carbon dioxide emissions. The plan also catalogues its continuing investment in the UK’s rail network and emphasises the importance of developing a national bus strategy and promoting such services to visitors, and reported that the government would look to work with tourist bodies and coach operators to facilitate and improve coach access to tourist destinations.

As part of its approach to building back better, the recovery plan also emphasises the importance innovation, resilience, sustainability and inclusivity. Innovation is seen to be vitally important in continuing to embrace the opportunities provided by developments in digital technology. Such developments may, for example, look to build on the virtual and augmented reality tourism and visitor experiences pioneered during lockdown in 2019 and 2020, and may prove vitally important in marketing a wide range of tourism attractions and destinations. In arguing that “protecting and enhancing the environment is at the heart of this government’s agenda”, the recovery plan suggests that tourism must play its part in “the overall sustainability agenda”, which “means pursuing a tourism industry that contributes to the enhancement and conservation of cultural, natural and historic heritage and minimises damage to the environment” (Department for Digital, Culture, Media & Sport 2021). The plan also argues that an inclusive and accessible tourism industry, that meets the needs of a wide range of consumers, is good for business and for people.

Concluding Reflections

A number of concluding reflections merit attention. In the face of the continuing unpredictability of the future of the COVID-19 pandemic, planning for the recovery of the tourism sector, poses a complex series of challenges for the UK government. On the one hand, the pandemic has caused a major global economic crisis which continues to pose a wide range of seemingly growing problems for the tourism industry. On the other hand, the diversity of the tourism industry means that recovery planning must address a wide range of issues. That said, the government has committed itself to work collaboratively with a wide range of stakeholders to achieve the ambitious goal of helping the tourism industry to recover as quickly as possible, with a return to pre-COVID-19 numbers as soon as possible. While the recovery plan is clearly specific to the UK, it can also be seen to provide a template against which to view government plans for the recovery of tourism in other countries.

That said, perhaps reassuringly, the UK's recovery plan mirrors a number of the themes raised earlier in the literature review, and that in turn provides some sense of general academic, and more specific policy, consensus on planning for the future of the UK tourism industry in the wake of the COVID-19 pandemic. Pardo and Ladeiras' (2020) emphasis on the importance of tourism intelligence, digital skills, and greater cooperation, for example, are certainly reflected in the UK's recovery plan, as is, the focus on the importance of government response, technology innovation, and local ownership, in Sharma et al.'s (2021) framework for reviving the tourism industry.

More specifically, sustainability, an important theme in the UK's recovery plan, is consistently stressed in the academic literature. As, for example, in Sharma et al.'s (2021) assertion that the tourism industry will increasingly be characterised by sustainable tourism. In a similar vein, there is Sigala's (2020) belief that the transformational opportunities effectively presented by the pandemic will create an operating environment for tourism that incorporates sustainability. At the same time, while Kuscer et al.'s (2021) work emphasised the importance of government interventions and stimulus packages in helping the tourism industry to tackle the COVID-19 crisis, they also saw sustainability and resilience as integral to recovery strategies. Collins-Kreiner and Ram's (2021) assertion that without a commitment to sustainable tourism the sector will not become more resilient and better prepared for future crises, also resonates. However, by way of a note of caution, Pardo and Ladeiras (2020), suggested that at that time, no single government had prioritised environmentally, socially or economically sustainable efforts

As such, the UK government's commitment to develop a sustainable tourism sector, might be seen to merit further attention. Here, there are initial issues in that sustainable development is a contested concept which means different things to different people. While the most common definition of sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987), there are a variety of definitions of sustainable development. There are, for example, definitions based in ecology, and

there are broader definitions, which embrace economic social and environmental goals. At the same time, a conceptual distinction is often made between weak and strong sustainability. Here, Roper (2012), for example, suggested that the former gives priority to economic growth while the latter recognises the environmental limits to such growth and argued that “strong sustainability subordinates economies to the natural environment and society”. On the one hand, the UK’s tourism recovery plan looks to accommodate economic and social, as well as environmental, objectives under its sustainability umbrella, without any explicit recognition, for example, that protecting the physical environment may be at odds with the goal of economic growth. On the other hand, the recovery plan would seem consistent with the weak, rather than strong, characterisation of sustainability, in that it privileges economic recovery, and renewed economic growth, over the enhancement and conservation of natural capital.

More generally, and more fundamentally, Cohen (2020) claimed that the COVID-19 crisis offered an important opportunity to step back from the pursuit of conspicuous consumption, and the increasing depletion of the earth’s finite resources, on which such patterns of consumption ultimately depend. Further, Cohen (2020) emphasised the importance of looking to ensure that the COVID-19 pandemic both informs, and contributes to, policies designed to promote the transition to more sustainable patterns of consumption. Any such transition would see the leading players, perhaps the majority of the players, within the tourism industry making major changes to their traditional business models, often built around the virtually unregulated use of natural resources, high volumes of visitors, and low cost labour. However, in spite of the severity of the COVID-19 crisis, there is little evidence that the UK government, the leading players within its tourism industry, or the vast majority of consumers, genuinely have the enthusiasm to pursue this transition.

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The COVID-19 Crisis, Tourism and Sustainable Development

Peter Jones & Daphne Comfort

This paper explores some of the relationships between tourism and sustainable development through the lens of the COVID-19 crisis. The paper provides an outline of the COVID-19 crisis, and explores some of the relationships between tourism and sustainable development as illuminated by the COVID-19 crisis. The paper suggests that the COVID-19 crisis has not only posed a range of major challenges for the tourist industry but that it has also signaled some environmental changes that may be central to the transition to a more sustainable future, highlighted some of the inherent contradictions and complexities within the concept of sustainable development, and suggested some radical solutions to the challenges of sustainability. This is not an empirical paper, rather it rehearses some of the arguments about the relationships between the tourism industry and sustainability and draws on the views and opinions of a number of authorities on sustainable development within the industry. As such, the paper offers an accessible review of some of the relationships between tourism and sustainable development at a very testing time for the industry.

Keywords: *COVID-19, crisis, tourism, sustainable development, corporate sustainability*

Introduction

COVID-19 has been described by Kristalina Georgieva, Managing Director of the International Monetary Fund, as "a crisis like no other" (World Economic Forum 2020) and it certainly had had a devastating impact on both the global economy and on sectoral economies. Segal (2020), for example, writing under the banner of the Centre for Strategic and International Studies, claimed "at the sectoral level, tourism and travel-related industries will be among the hardest hit as authorities encourage social distancing and consumers to stay indoors." The United Nations World Tourism Organization (UNWTO) (2020) reported that "the worldwide outbreak of COVID-19 has brought the world to a standstill," and claimed that "tourism has been the worst affected of all major economic sectors." More specifically, Zurab Pololikashvili, Secretary-General of the UNWTO (2020) has argued "the sudden and unexpected fall in tourism demand caused by COVID-19 places millions of jobs and livelihoods at risk while at the same time jeopardising the advances made in sustainable development and equality over recent years."

The initial formal definition of sustainable development namely, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development 1987) is still widely used over three decades after it was framed. That said, the concept has been extended to more fully recognise its environmental, social and economic dimensions, to embrace equity across geographical space, as

well as over time, to incorporate business imperatives as part of corporate sustainability strategies, and to encompass a wide range of human endeavours and environmental events.

More specifically, the concept of sustainable development has attracted attention from tourism scholars. Hall et al. (2015), for example, claimed that sustainable tourism "has been incorporated into the fabric of academic discourse in academic, business and governance terms." Ural (2015) suggested that "the magnitude of disaster/catastrophic risks has become a major topic of discussion for a sustainable tourism." That said, work in this genre has traditionally been focussed on national economies or local environments. de Sausmarez (2007), for example, writing under the banner "Crisis Management, Sustainability and Tourism," argued that "the damage to tourism caused by a crisis or disaster may not only have serious implications for a national economy but also threaten the livelihoods of many in the destination." However, the COVID-19 crisis has posed a wide range of major challenges for tourism throughout the world and it has taken the tourism industry into uncharted waters.

With these thoughts in mind this paper explores some of the relationships between tourism and sustainable development through the lens of the COVID-19 crisis. The paper describes the features of the COVID-19 crisis, outlines some of the environmental, economic and social and impacts of the crisis, examines the consequences of the crisis for corporate sustainability programmes in the tourism industry and explores some of the inherent contradictions within the concept of sustainable development highlighted by the crisis. This is not an empirical paper, rather it rehearses some of the arguments about the relationships between tourism and sustainable development and draws on the views and opinions of a number of authorities on sustainable development within the tourism industry. The paper was written in May 2020, while both the authors were in lockdown, and as such, to adopt a military metaphor, it offers a view from the battlefield, at a time when the tourism industry seemed under siege.

The COVID-19 Crisis

COVID-19 is an infectious disease caused by SARS-CoV-2, a newly discovered coronavirus. Coronaviruses are part of a large family of viruses that can affect birds and mammals, including humans. In recent years, this family of viruses has been responsible for several disease outbreaks around the world, including Severe Acute Respiratory Syndrome in 2002-2003 and the Middle East Respiratory Syndrome first reported in South Korea in 2012. COVID-19 primarily affects the lungs and airways leading to mainly respiratory symptoms, e.g., cough and shortness of breath, and fevers. The majority of people with COVID-19 experience mild symptoms of the disease and recover without requiring specialist treatment. However older people, and those with underlying medical problems such as cardiovascular disease, diabetes, chronic respiratory disease and those with a weakened immune system are more likely to develop serious illness and are at an increased risk of dying from the disease.

The disease can spread from person to person through small droplets from the nose or mouth which are spread when a person with COVID-19 coughs, sneezes or exhales. These droplets land on objects and surfaces around the person. Other people then catch COVID-19 by touching these objects or surfaces, then touching their eyes, nose or mouth. People can also catch COVID-19 if they breathe in droplets from a person with COVID-19 who coughs, sneezes or exhales droplets. Precise details of the origins and initial spread of COVID-19 are hard to confirm, but there is some agreement that the disease originated in a wholesale market in Wuhan, a city of some 11 million people, in Eastern China, and that some of the market traders may have contracted the disease following contact with animals at the market.

On 31 December 2019, China alerted the World Health Organisation to several cases of unusual pneumonia in Wuhan, and several of those infected, worked at one of the city's markets. Early in 2020 the disease spread rapidly, first to other regions of China, and eventually to the majority of the world's countries, and the World Health Organisation declared the global outbreak of COVID-19 a pandemic on 11 March 2020. Though the nature of the response to the crisis has varied from one country to another, all medical authorities and governments have struggled to combat COVID-19. Medical pressures included providing large numbers of bed spaces and specialist equipment to treat seriously ill patients, sufficient numbers of, and personal protection equipment for, medical staff, and adequate testing facilities. The policies adopted by many governments have centred on enforcing social distancing by strongly recommending restrictions on the movement of people, popularly described as lockdown, and instructing many businesses to close down, in an attempt to prevent the spread of the disease.

The COVID-19 crisis has certainly had a wide range of environmental, economic and social consequences and as such has had a major impact on sustainable development. At the same time, the crisis has identified the need to extend the scope of sustainable development. Here there is the issue of the role of sustainable development in preventing future pandemics, as such events, thankfully relatively rare as they are, have not been included in traditional approaches to sustainability. Di Marco et al. (2020) observed that "little attention has been paid to the interactions between environmental change and infectious disease emergence" and such interactions are "not customarily integrated into planning for sustainable development." More specifically, Di Marco et al. (2020) claimed that the emergence of diseases "is driven by anthropogenic changes such as deforestation and expansion of agricultural land (i.e. land-use change), intensification of livestock production, and increased hunting and trading of wildlife." Looking to the future, Di Marco et al. (2020) claimed that human health could be more effectively integrated within sustainable development planning but argued this required "a cross-disciplinary research approach," which would involve "socioeconomic change, pathogen dynamics, and biological and behavioral aspects of humans, wildlife, and livestock."

Environmental, Economic and Social Impacts

The relationship between tourism and sustainable development, as illuminated by the COVID-19 crisis, can be seen in a number of ways. Initially, a number of environmental improvements were identified including marked reductions in pollution levels and greenhouse gas emissions, following the closure of many power generation plants and factories, the dramatic fall in the volume of air travel and the restrictions on the movement of people in motor vehicles. However, such improvements will surely not be maintained if/when the economy recovers. Inger Anderson, Head of the United Nations Environment Programme, for example, was reported as arguing "we need to take on board the environmental signals and what they mean for our future and wellbeing because COVID-19 is by no means a silver lining for the environment," that "visible positive impacts—whether through improved air quality or reduced greenhouse gas emissions—are but temporary because they come on the back of tragic economic slowdown and human distress" (United Nations Department of Social and Economic Affairs 2020).

While the COVID-19 crisis has brought some general environmental gains, it has also had a devastating economic and social impact. Within Europe, for example, Neisdadt (2020), writing in April 2020 under the banner of the European Parliament Research Service, estimated that the tourism industry within the European Union was losing Euro 1 billion per month as a result of the COVID-19 crisis. More specifically, Neisdadt (2020) suggested that "the situation is particularly difficult in several European Union countries that are key tourist destinations, such as Italy, Spain and France." Overall, Statista (2020) estimated that 1.6 million jobs were at risk in the tourism sector in Germany due to the COVID-19 crisis, while the corresponding figures for Russia, Italy, Spain, France and Portugal were 1.1 million, 1 million, 0.8 million, 0.8 million and 0.3 million, respectively.

More widely, the United Nations Department of Economic and Social Affairs (2020), for example, reported on the impact of COVID-19 on the global tourism industry, noting that, "many tourism dependent countries rely heavily on tourist arrivals from a particular country—the United States, for example—as in the case of many Caribbean countries. These economies would experience sharp increases in unemployment rates affecting the livelihood of low-skilled workers and the more vulnerable segments of society that depend on income from tourism-related activities." In an assessment of the impact of the COVID-19 crisis on international tourism dated 24 March 2020, the UNWTO (2020) cautioned that given "the unparalleled and fast-evolving nature of the crisis, it is extremely challenging to estimate the impact of COVID-19 on international tourism" but estimated that "international tourist arrivals could decline by 20% to 30% in 2020." Further the UNWTO (2020) suggested that this would translate into a loss of US \$300 to \$450 billion in international tourism receipts. More pessimistically, in April 2020, the Organisation for Economic Cooperation and Development (OECD) (2020) estimated that the decline in international tourism in 2020 could be between 45% and 70%, depending on when recovery begins to take place, and warned that the general economic decline due to the COVID-19 crisis will also delay recovery within the tourism industry.

OECD (2020) has argued that the COVID-19 crisis, is "first and foremost, a humanitarian crisis affecting people's lives" and that "this has very tangible impacts for the tourism sector, which is critical for many people, places and businesses." Further, OECD (2020) argued that tourism "directly supports numerous types of jobs and businesses and underpins many local communities," that it is "a leading job creator, and in normal circumstances can help provide diverse employment opportunities for many low skilled immigrants, women, students and older workers" particularly "in remote, rural, coastal and other often economically fragile locations where alternative opportunities may be limited."

The COVID-19 crisis has clearly had damaging economic and social consequences for sustainable development within many countries where tourism is an important element in the economy. In some European countries, governments have put measures in place in an attempt to prevent permanent redundancies and avoid job losses but many tourism businesses, and companies which service tourism businesses, are run by independent self-employed workers and their families and are often not eligible for government support packages. More widely, outside of Europe and more specifically in many small less developed countries, such as the Maldives, the Seychelles, Grenada and St Kitts and Nevis, for example, where tourism accounts for over 50% of the Gross Domestic Product (GDP). The magnitude of direct, and more significantly indirect, job losses, in tourism caused by the COVID-19 crisis has been much greater. In some of these countries, economic activity is much more informal and millions of people hit by the COVID-19 crisis, have no other income to support themselves and their families and they, and their families, have been thrown into the poverty abyss. Such problems have almost certainly considerably set back the course of economic and social sustainable development in many parts of the world.

Corporate Sustainability Programmes

In recent years, corporate sustainability has assumed increasing importance within the business community, and many of the leading players in the tourism industry have pursued sustainability programmes designed to incorporate environmental, social, economic and governance issues into their business strategies. (e.g., Jones et al. 2014). However, COVID-19 poses a number of challenges for such programmes. On the one hand, such challenges may involve the need to respond to both investors' demands and as well as to changes in customers' tourism behaviours. Investors' demands may include promoting long term reductions in tourism companies' carbon emissions and pollution levels, greater employment of renewable energy resources, a clearer commitment to waste recycling and the development of circular economy principles. At the same time public health concerns, and continuing government restrictions on international travel, may be reflected in changing tourism behaviour with people choosing to take holidays within their own countries rather than to travel abroad. All of these changes may, in turn, effectively force changes in the conventional business models of many of companies in the tourism industry.

On the other hand, the COVID-19 crisis will surely reduce the availability of, and access to, capital and this may, in turn, see available financial resources being targeted on essential core business activities. At the corporate level, extensive, high profile and costly marketing campaigns designed, for example, to promote tour packages and ocean and river cruises, and to re-engage with previous customers, and investment to try to ensure that returning customers are provided with high quality experiences, may well take precedence over environmental and social agendas within corporate sustainability programmes. At the operational level, the COVID-19 crisis has highlighted the importance of greater attention being given, to basic hygiene and cleaning operations, to routine health care screening for travellers and patrons and to a greater focus on the provenance of food sourcing throughout the supply chain. At the same time, employees should be able to access regular health checks, and businesses within the tourism industry may be advised to maintain a wider welfare brief on their employees. Such measures come at a cost but they may prove important in helping to maintain a healthy workforce and regain consumer confidence and in offering a source of competitive advantage in what is likely to be an increasingly challenging marketplace.

Following the launch of the Sustainable Development Goals (SDGs) in 2016, some of the leading companies within the tourism industry have responded positively to the United Nations call for businesses to rise to the challenges and opportunities they presented. While a number of trade organisations within the tourism industry argued that tourism companies can play a major role in contributing to the SDGs, Jones and Comfort's (2019) exploratory review of the world's leading hotel groups revealed varying levels of enthusiasm for these ambitious targets. More generally in discussing the role of the private sector in contributing to the SDGs, Scheyvens et al. (2016) claimed "there is a clash between the dominant business model, which is based upon short term planning with a narrow focus on finances, and a longer term sustainable development agenda" and specifically within the tourism industry they suggested that this "is not good for sustainable, responsible destination planning, and rather it can actively undermine the wellbeing and sustainable development of destination communities."

Given such existing concerns, it remains to be seen how the COVID-19 crisis will impact upon the tourism industry's commitments to the SDG's and the situation is, at best, uncertain. On the one hand, companies may well argue that it is only by re-opening their businesses and returning to something approaching business as normal, will they have the strength and resources and be in a position to continue to contribute to the achievement of the SDGs during the next decade. In the medium term, this may encourage large companies to push back their existing commitments to the SDGs. On the other hand, in those areas of the less developed world where the need for many of the SDG's, focused for example, on the eradication of poverty and hunger, on the widespread availability of clean water and sanitation, and on the promotion of gender equality, are greatest, many of the limited gains made since 2015 may well have been lost in the wake of the COVID-19 crisis. Such concerns are surely heightened at a time when the

Sustainable Development Solutions Network/Institute for European Environmental Policy (2019) reported that none of the countries within the European Union, let alone the less developed world, were on track to meet their SDG targets.

Contradictions and Complexities

More generally, the COVID-19 crisis has served to highlight some of the contradictions and complexities of sustainable development. On the one hand, there are inherent tensions within the concept as illustrated by the contrasts between the environmental benefits and the wide ranging economic and social costs of the COVID-19 crisis. On the other hand, there are tensions between economic forces and both environmental and social goals illustrated by some of the leading tourist companies' commitments to sustainable development. In concluding their review of the sustainability programmes being pursued by the world's leading hotel groups, Jones et. al 2014, for example, argued that "the global hotel industry's commitments to sustainability have been developed within existing capitalist business models which are focused on continuing economic growth." Here, Liverman's (2018) concerns that "growth goals cannot be met without sacrificing many environmental ones or that sustainability cannot be achieved under the current economic model of capitalism" might be seen to resonate.

At the same time, Kumar (2020) Chief Environmental Economist, United Nations Environment Programme, was reported as arguing "the emergence of COVID-19 has underscored the mutually-affective relationship between people and nature," that "we must try to understand and appreciate the limits to which humans can push nature, before the impact is negative," and that "those limits must be embraced by our consumption and production aspiration." In many ways sustainable consumption is elusive, it has no generally agreed definition, and in many ways, it is also a contradiction in terms. Indeed, sustainable consumption has been described as "the most obdurate challenge for the sustainable development agenda" (Cohen 2005), while the European Environment Agency (2020) described "unsustainable consumption" as "the mother of all environmental issues." More specifically, the United Nations World Tourism Organisation and the United Nations Environment Programme (2020) suggested that "unsustainable consumption and production practices represent one of the major barriers to sustainable development" but suggested that "the concept of sustainable consumption and production is not commonly used by tourism policy makers."

Increased affluence is generally seen to be one of the drivers of the growth of tourism, which people can enjoy, and arguably more importantly can afford, when they have access to the financial resources to enable them to meet what might be seen as the basic human needs of food, clothing and shelter. As tourism has become more accessible to seemingly ever larger numbers of people, this, in turn, has led to increasing demands on the earth's natural resources. In many ways, the concept of sustainable development provides a testing paradox within the tourism industry. On the one hand, the tourism industry increasingly looks to celebrate its

commitment to sustainable development. Royal Caribbean Cruises (2019) for example, reported "oceans are 71% of the planet and 100% critical to our business. Conserving their health is paramount. Our 2020 environmental goals set ambitious and measurable sustainability targets to reduce our environmental footprint and raise awareness about ocean conservation."

On the other hand, the headline accent is often on conspicuous consumption, which, in many ways, is the antithesis of sustainability. Such a focus on conspicuous consumption within the tourism industry is perhaps most clearly epitomised in ocean cruising. Royal Caribbean Cruises (2016) one of the two market leaders described its ship "Freedom of the Seas," as "the ultimate in luxury." The vessel, which can accommodate 4,375 passengers, offered a main dining room with full waitress service as well as "Chops Grille," described "as a high-end grill where you'll find the likes of filet mignon and mesquite-grilled salmon on a menu that changes daily" (Royal Caribbean Cruises 2016). Carnival Corporation, the other market leader, claimed to be able to "provide our guests with virtually endless holiday choices" (Carnival Corporation 2016). Williams and Ponsford (2009) captured the paradox in drawing attention to what they described as "tourism's environmental paradox" in that tourism simultaneously seeks often fragile and sensitive environmental resources as "core ingredients and compelling backdrops for the production and consumption of tourist experiences" and "it also requires the protection of the ecological integrity and abundance of these resources for sustained competitiveness."

However, the COVID-19 crisis has opened a window on what some advocates see as a more sustainable world. In acknowledging "we are now struggling to anticipate the impacts of COVID-19" as "major financial markets are gyrating and international supply chains are in turmoil," Cohen (2020), for example, pointed out that "while the present situation is being treated as an emergent economic crisis, it merits acknowledging that sustainability scientists and policy makers have implicitly been seeking to achieve over the past decade broadly similar objectives in the form of a sustainable consumption transition." Further, Cohen (2020) argued "while it may seem fanciful and insolent, COVID-19 is an opportunity to reduce over the longer term the prevalence of lifestyle premised on large volumes of energy and material throughput" and concludes "policy makers should work to ensure that the coronavirus outbreak contributes to a sustainable consumption transition." Such a transition would demand major changes in the current business model of the vast majority of large companies in the tourism industry. At the present time, neither the majority of companies in the tourist industry, nor their customers, seem likely to take such an opportunity, or to have much enthusiasm for policy makers who advocate such a future.

Conclusion

This paper aimed to explore some of the relationships between tourism and sustainable development through the lens of the COVID-19 crisis. The COVID-19 crisis has not only posed a range of complex challenges for tourist businesses but it

has also exposed some new perspectives in the relationships between tourism and sustainable development. Looking forwards, it remains to be seen what the future holds, and how these relationships will be played out. On the one hand, the hope is for a return to some sort of normality, though, at the time of writing, the time scale and the extent, of such a return remains very uncertain. However, within such a scenario, many businesses within the tourism industry, and their customers, may effectively look to pick up where they left off, as part of a much wider post COVID-19 crisis recovery. Here government and corporate sustainability programmes may effectively be put on hold as capital resources are focused on economic recovery. On the other hand, the COVID-19 crisis has opened a window on some of the relationships between tourism and sustainable development, it has signalled some environmental changes that may be central to a transition to a more sustainable future, it has highlighted some of the inherent contradictions and complexities within the concept of sustainable development and it has offered some radical solutions to the challenges of sustainability. Whether tourism businesses, large and small, or the vast majority of their customers, will want to recognise the significance of such signals and have any genuine enthusiasm for such solutions remains very much to be seen.

The authors recognise that the paper has its limitations, not least that it draws exclusively on secondary sources drawn from the Internet. This reflects the reality that both the authors were in lockdown, and that for a number of reasons, traditional avenues of empirical research were not open to them. Nevertheless, the authors believe that the paper offers an important snap shot in time of the impact of COVID-19 on the relationship between tourism and sustainable development and provides a valuable platform for future research. Looking to the future, a number of conceptual and research issues merit the attention of tourism scholars. In addressing the continuing importance of developing and refining conceptual frameworks connecting nature and society, two sets of issues merit attention.

In addressing the continuing importance of developing and refining conceptual frameworks connecting nature and society, two sets of issues merit attention. Firstly, for those scholars who have drawn on stakeholder theory to conceptualise sustainability, the COVID-19 crisis certainly emphasises the need to integrate the interests of a wider range of stakeholders including, all employees, customers and society at large to provide a more comprehensive theoretical approach to sustainable development. Secondly, some the relationships between the tourism industry and sustainable development exposed by the COVID-19 crisis, seem valuable in informing to a more critical theory of sustainability, which seeks to locate sustainable development within wider economic, social and political structures. While stakeholder theory has been widely employed to explore sustainable development within the tourism industry, very limited attention has been given to more critical conceptual approaches. This is perhaps not altogether surprising given the, often close, working and professional relationships between many tourism scholars and an industry which is committed to growth, and where radical ideas have a limited constituency. Nevertheless, this is certainly a lacuna which merits future research.

At the empirical level, there are a wide range of research opportunities across a range of sub disciplines but three simple examples serve to illustrate the potential scope for work on the impact of the COVID-19 crisis on sustainable development within the tourism industry. In marketing, for example, market research designed to explore consumers' attitudes to a range of tourism activities and destinations at both a local and an international level, will shed light on if, and how, such customers are changing their behaviours in the light of the COVID-19 crisis. Research might also focus on the impact of the COVID-19 crisis on the management of supply chains within the tourism industry and perhaps more specifically on the issue of provenance within the food supply chain. Research into how information and communication technologies are being employed to help to address continuing customer safety concerns would also seem to offer fertile ground for future research.

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The Near Abasement of Uganda Hotels' Staff Altruistic Behaviour by COVID-19 Pandemic: A Relief Model

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This paper aims to analyze the relationship between employee optimism, status competitiveness, interpersonal adaptability and employee altruism during the COVID-19 pandemic. In addition, it examined the mediating effect of interpersonal adaptability and employee optimism in the stated relationship. A quantitative study was conducted using a sample of 303 respondents that constituted both managers and employees from 70 selected hotels in Uganda shortly after the end of the first lockdown in July, 2020. The associated hypotheses were tested using the Smart-PLS 3.2 software. Once employees are optimistic, undergo free and fair competition for any position, and feel that they freely interact with one another, then they are bound to devote themselves to the welfare of one another at all costs. It examined employee optimism, status competitiveness, and interpersonal adaptability as explanations of employee altruism. This is in addition to the mediation effect of interpersonal adaptability and employee optimism in the stated relationship. In terms of its value, when employees have positive expectations regardless of the current challenges they undergo, there is fair competition for all positions in the organization, and that they interact freely, they can offer help for others' welfare.

Keywords: *employee optimism, status competitiveness, interpersonal adaptability, employee altruism, organizational citizenship behavior and COVID-19*

Introduction

The devotion to the welfare of others underlies the summative essence of employee altruistic behaviour. This is because it precisely denotes an act of sacrificing or risking one's own interests for the sake of another(s), usually at less or no personal cost (Savulescu and Wilkinson 2020). It involves those fairly small but timely and relevant sacrifices to the recipient, such as: attending to a sick colleague in a hospital, donating a kidney to a family member and standing in for a coworker just because he or she is unable. Altruism was derived from a Latin word "alter" which means "other," and its first application is merrily associated with Auguste Comte in the 1830s (Green 2005) who used it to mean caring for others.

However, while the largest percentage of altruism involves little or no cost, this behaviour has in certain cases been offered in extreme circumstances. For instance, some people offer to work for the helpless away from their home countries. To date, we continue to witness cases where medics have walked the extra mile to provide medical care to the sick. In times of war and violence, the services of the Red Cross are by no means merely an illustration. While this behavior continues to be demonstrated by people in our respective societies, in Uganda, the hotel industry has been hit big by the COVID-19 pandemic. Following the ease in lockdown measures, the response mechanisms in place have, and

continue to threaten, altruistic employee behaviours. For instance, through the help of personal observation, there is glaring disregard for personal assistance. Workmates no longer easily step in to offer assistance to a friend in-need; this is regardless of such ongoing measures such as sanitization, wearing masks, let alone social-distancing. There are marked diminishing employee feelings of concern and empathy for others let alone their hitherto actions that benefit one another. This has stretched to even affect clients. What is important to note is that the dictates of altruism warrant that, even in such extreme situations, employees are still expected to act in such ways that continue to benefit others even when there is evident fear of personal risks (Savulescu and Wilkinson 2020).

Based on these observations, some of the explanations for the reduction in employee altruistic behaviors that were provided by the selected staff we interacted with, were but not limited to a reduction in employee optimism, interpersonal adaptability and status competitiveness. According to those interviewed, they observed that generally staff continue to believe that COVID-19 is real and here to stay. Therefore, they do not envisage proper mechanisms through which to secure their lives (not optimistic). What worries most is that some staff were laid-off since very few clients visit to hotels to date. Therefore, they better relax the extent of care that they have been offering to both their colleagues and clients. For as long as they can be retained on their jobs, so be it. In addition, due to social distancing as a COVID-19 response mechanism, there is no opportunity to freely interact with one another, either with clients or colleagues. This is the essence of absence of interpersonal adaptability. Actually, employees are now being challenged to accept this as a new normal until further notice, since to date, it is hard to tell who is with the infection given that many people are asymptomatic. Therefore, the need to easily socialize and relate with others so as to enhance productive behaviors within the hotels has so far hit a snag. In addition, as for status competitiveness, due to status differences, supervisors are now too bossy, therefore, isolated from their subordinates, reserved, often stay on their desks, irregularly move around and about the hotels and do not wish to easily mix with subordinates. The consequence of all these abating factors is that the selfless behaviors (altruistic behaviors) that inevitably foster individual and organizational efficiency and effectiveness, have significantly declined.

Theoretical Background

In order to attach a theoretical lens to the relationship between employee optimism, status competitiveness, interpersonal adaptability and employee altruism in the context of Uganda hotels, two theories have been adapted. These are: the Interpersonal Theory (Kiesler 1996) and the Social Comparison Theory (Festinger 1954).

Employee Optimism, Status Competitiveness Interpersonal Adaptability and Employee Altruism

In this study, employee altruism refers to the assistance or care that employees offer to their colleagues at little or no cost without expecting to be rewarded (Savulescu and Wilkinson 2020). Employee optimism is taken to mean the generalized feeling amongst people that positive experiences will occur in the future while those that are negative will be minimized (Carver and Scheier 2014). Status competitiveness refers to the struggles that are associated with the socially accepted ranking of individuals, groups, or activities in any social structure (Washington and Zajac 2005). Interpersonal adaptability refers to the flexibility and willingness to interact with others in different situations (Kiesler 1996).

The Interpersonal Theory (Kiesler 1996)

This theory is derived from the notion of interpersonal reciprocation. This view argues that people in a relationship choose to behave in such ways that maintain or reflect similar previous actions and expectations towards each other. This implies that the actions of one party in a relationship simply depict and reaffirm what the other did before. The result is a relationship characterized by a give and return behavior amongst the interactants. To this extent, it could be argued that people in an interaction are usually flexible to the extent that they reciprocate what each other does (interpersonal adaptability). This is to the extent that whenever one party behaves in a particular way, he or she remains expectant that at some point in time, the other party will behave in a similar manner. This is the essence of employee optimism. Further, it should be overtly stated that in an effective interpersonal interaction, since positive expectations (optimism) are characteristic, offering help to one another (altruism) in such a relationship at little or no cost without expecting to be rewarded could result. This is as such to indicate that the interpersonal theory can explain employee optimism, interpersonal adaptability and employee altruistic behaviors. However, while there is a basis for an inference that employee optimism, interpersonal adaptability and employee altruism could be related, this is not to imply that the theory advances the argument that interpersonal adaptability, mediates in the relationship between employee optimism and employee altruism. Further, the theory does not in any way reflect the argument that interpersonal behaviors are competitive at all. This is because each action of a party in an interaction is voluntarily induced by the actions of the other (Kiesler 1996). Indeed, this is the basis of the integration of the social comparison theory (Festinger 1954), which advances the element of competition in a social system so as to rise or maintain a particular social status in an organization.

Empirically, while there is scanty literature to attest to a relationship between employee optimism, status competitiveness interpersonal adaptability and employee altruism, somehow, the works of Xiao et al. (2020) fragmentally suggest so. This is because, they argue that workplace friendship is the manifestation of interpersonal relationships in the workplace. It is important to note that workplace friendship not only manifests interpersonal relationships, but as well, employee optimism, interpersonal adaptability and selfless helping behavior (altruistic

behavior). However, this possible relationship is devoid of traits of status competitiveness. Besides, while Xiao et al. (2020) make a possible basis against which to infer the stated relationship, they do not attempt in any way to state that, interpersonal adaptability and employee optimism, are possible mediators of the relationship under investigation.

Further, the works of Yin et al. (2018) could equally be a basis for inferring that a possible relationship between employee optimism, status competitiveness interpersonal adaptability and employee altruism, could be existent. To these scholars, workplace friendship can positively affect employees' attitudes toward work, and as such, their mates. It could be humbly argued that workplace friendship cannot exist without such employee perceptions of optimism, interpersonal adaptability and selfless behaviors towards one another. This is because their absence implies lack of friendship at the workplace. In this respect, the fact that they move hand-in-hand they could as well be related. However, just as it has been the case in the foregoing scholarly works, Yin et al. (2018) does not as well propose that interpersonal adaptability and employee optimism mediate in the assumed relationship. Besides, these scholars remain silent about a possible inherent inclusion in the hypothesized relationship, status competitiveness.

Equally, Wei et al. (2019) could allude to a possible relationship between employee optimism, status competitiveness interpersonal adaptability and employee altruism. This is because, to these scholars, a negative emotional state in employees has a direct effect on their work attitude and thoughts and this affects their extra role behaviors. By implication, when employees have positive emotions such as when they are optimistic, they are bound to have positive work attitudes such as easily integrating with each other which subsequently leads to extra role behaviors such as altruism. These scholars however do not propose that subsequently, in such a relationship, status competitiveness is inherent, and that the said relationship could be mediated by interpersonal adaptability and employee optimism. Therefore, to this extent, it was possible to hypothesize that:

- H₁. Employee optimism is significantly related to employee altruism.
- H₂. Employee optimism is significantly related to interpersonal adaptability.
- H₃. Interpersonal adaptability and employee altruism are significantly related.
- H₄. Interpersonal adaptability mediates in the relationship between employee optimism and employee altruism.

Employee Optimism, Status Competitiveness Interpersonal Adaptability and Employee Altruism

The Social Comparison Theory (Festinger 1954)

This theory posits that individuals in a social system choose to perform better than others. In return, the urge to always do better than others introduces competitive behavior amongst them. Therefore, given that competition is driven by associated privileges, such as a rise in rank or social status, competition is part of human behavior in any social system. In relation to the current study, status competitiveness is inherent in the Uganda hotels' management structures. This is

because, due to competition, superiority in performance amongst workers has accrued, and in return, some occupy lower ranks than others. It is those in superior positions that have chosen to remain reserved, keep busy around their desks and do not move around and about the hotels to supervise others due to the fear of COVID-19. This has led to the continuing inflexibility amongst the workers to the extent that employees practically do not blend with one another easily even when it comes to offering each other the necessary assistance (altruistic behaviors) intended to enhance their hotels' efficiency and effectiveness. This is why there is a marked reduction in employee altruism yet these behaviors are critical to the hotels' productivity, although employees are always optimistic whenever they compete through performance enhancement. However, regardless of this implied relationship amongst status competitiveness, employee optimism, interpersonal adaptability and employee altruistic behaviors, to date, there is a paucity of scholarship that attempts to link these constructs. Besides, there is a lack of scholarly evidence to suggest that interpersonal adaptability mediates in the relationship between status competitiveness and employee altruistic behaviour.

In addition, a quick review of the scanty empirical literature relating employee optimism, status competitiveness, interpersonal adaptability and employee altruism, indicates that there could exist a basis against which to hesitantly argue for a derived relationship amongst these variables, however, one that is marked with significant weaknesses that justified the need for this investigation.

For instance, to Anjum et al. (2019), when there is a high level of friendship amongst workers in an organization, the near equivalent of interpersonal adaptability, employees respond by demonstrating strong willingness to share what they have with colleagues, resurrection of emotional needs such as optimism, the will to continue working in the organization in any capacity of choice, the equation to status competitiveness and obviously wanting to help each other at all costs (altruism). Under such an environment, it is possible to argue that these variables are related, considering that all could exist under the same conditions. However, while it is possible to assume this relationship, it is important to note that the relationship is just a derivative of a study that had an entirely different set of variables. Besides, these scholars do not permit a sense of a conclusion that interpersonal adaptability and employee optimism could mediate in a relationship that is being assumed. In addition, the theoretical lens that Anjum et al. (2019) employed to anchor this study is contrary to what the current study has adapted. This implies a contradiction in the constructs' validity of the respective studies.

In a related argument by Yu et al. (2021), there is another point of view against which to derive a possible linkage amongst these variables, but definitely with marked weaknesses. These scholars argue that workplace friendship results in the achievement of individuals' emotional needs in the organization, knowledge sharing, mutual help among workmates, harmonious working atmosphere characterized by mutual trust and love and increased resource investment in extra-role behavior. In the preceding argument, work friendship was treated as the equivalent of interpersonal adaptability which has the potential to lead to emotional needs such as employee optimism, mutual help among workmates (employee altruism). It could reluctantly be argued that against such a background, the spirit of competition for

the different positions in the organizational structure could be present. However, until now, even when this relationship could be assumed, it is ideally a derived one without any sufficient empiricism. Besides, the mediation tests alluded to in the present study, are not mentioned anywhere in the study by Yu et al. (2021). Therefore, it was necessary then to hypothesize that:

- H₅. Status competitiveness is significantly related to interpersonal adaptability
- H₆. Status competitiveness and employee altruism are significantly related.
- H₇. Interpersonal adaptability mediates in the relationship between status competitiveness and employee altruism.
- H₈. Employee optimism mediates in the relationship between status competitiveness and interpersonal adaptability.
- H₉. Employee optimism is mediates in the relationship between status competitiveness, and employee altruism.

Methodology

Study Population, Sample Size and Procedure

The staffing of hotels in Uganda was investigated. There are 516 hotels in Uganda ([www.jovago.com/Uganda hotels](http://www.jovago.com/Uganda%20hotels)). For the purpose of this study, out of the stated total number of hotels (516), 220 hotels were selected randomly from the list of hotels using a simple random sampling technique. After contacting each one of those that had been selected, 100 hotels accepted to participate in the study. 5 questionnaires were then distributed to 5 people in each of the 100 hotels that appeared in the final sample for this study. Of the five (5) potential respondents, one (1) was a supervisor and four (4) were subordinates. This selection approach led to the distribution of 500 questionnaires to 500 potential respondents. Out of the 500 questionnaires distributed, 350 were realized. This means that 150 questionnaires were never realized. This implies that an average of seventy (70) hotels finally participated. Therefore, the final usable sample was three hundred fifty (350) respondents which dropped to (303) after data-cleaning. These hotels were located in 16 districts of Uganda but they had not been classified because, until now, the hotel classification in Uganda is still ongoing.

Operationalization and Measurement of Study Variables

The study variables were operationalized based on earlier scholarly works. Four variables were examined which are: employee optimism, status competitiveness, interpersonal adaptability and employee altruism. All the items that measured these variables were anchored on a five point likert scale which ranged from 1= strongly disagree to 5= strongly agree. This is because this scale provides a neutral middle point which caters for a condition in which a respondent may not have an opinion on the question at hand (Chung Ho Yu 2008). The description of the measurements for each variable is as follows:

Employee Optimism

The unidimensional scale by Cameron et al. (2004) was modified for this study. It consists of six items that directly measure employee optimism. Some of the sample items include: "As employees of this organization, we are optimistic that we will succeed, even when faced with major challenges." This was modified to read as follows: "As employees of this hotel, even under this COVID-19 pandemic situation, we are optimistic that we will succeed, even when faced with major challenges." The second item is: "In this organization, we are dedicated to doing good in addition to doing well." This was modified to read as follows: "In this hotel, regardless of the COVID-19 pandemic situation, we are dedicated to doing good in addition to doing well."

Status Competitiveness

The one-dimensional scale of status competitiveness by Fletcher and Nusbaum (2010) was modified for this study. It is constituted by seventeen items that measure status competitiveness. Some of the sample items include: "My status at work depends on my performance relative to others." This was modified to read as follows: "Under this COVID-19 pandemic situation, my status at work depends on my performance relative to others." The second item: "My achievements are routinely compared to those of my coworkers." This was modified to read as follows: "Under this COVID-19 pandemic situation, my achievements are routinely compared to those of my coworkers."

Interpersonal Adaptability

This was measured using the unidimensional scale of Charbonnier-Voirin and Roussel (2012). This scale consists of five items that measure interpersonal adaptability. Some of the sample items include: "I adapt my work practices to the requirements and suggestions of others." This was modified to read as "under this COVID-19 pandemic situation, I adapt my work practices to the requirements and suggestions of others." The second item: "I try to understand the viewpoints of my counterparts to improve my interaction with them." "Under this COVID-19 pandemic situation, I try to understand the viewpoints of my counterparts so as to improve my interaction with them."

Employee Altruism

The one-dimensional scale by Organ (1988) was adapted for this study. It is a six-item scale that measures employee altruistic behaviors. Some of the sample items include: "Helps others who have heavy workloads in this organization." This was modified to read as follows: "Regardless of this COVID-19 pandemic situation, I help others who have heavy workloads in this hotel." The second item: "Helps others who have been absent in this organization." This was modified to read as follows: "Regardless of this COVID-19 pandemic situation, I help others who have been absent in this hotel."

Common Method Bias

To control for common methods bias, we kept questions short and precise, avoided double-barreled questions and limited the use of negatively worded items. We ensured respondents’ anonymity which enabled them to give unbiased responses. Further, we conducted multiple follow-up calls and email reminders for those who delayed to answer the questionnaire. In addition, we adapted previously validated measurement scales to suit the study context. We also contacted three professional academics and two managers to ensure the items were clear and captured their respective constructs. We further used four respondents for each sampled unit of analysis, whereby we received 303 questionnaires in 70 hotels.

Measurement Validation

We assessed the convergent validity of the item using two criteria; standardized item load of above 0.708 and average variance extracted (AVE) above 0.5. The results in Table 4 indicate that these two criteria were met as recommended by Hair et al. (2017), indicating that the items measure what they are intended to measure. Internal consistence was assessed in terms of Cronbach’s Alpha and composite reliability by considering indices above 0.6 (Hair et al. 2017). The results reveal that the coefficient for the study variables—altruism, interpersonal adaptability, optimism and status competitiveness—are all well above the 0.6 threshold, indicating that the data is reliable.

Table 1. Measurement Validation Results

Measures / Constructs	Weight/ Loading	VIF	CV ² Communality	CV ² Redundancy	α	Rho-A	CR	AVE ¹
ALT1	0.768	1.137	0.33					
ALT6	0.754	1.418	0.43					
ALT7	0.746	1.365	0.32					
Altruism		1.730	0.34		0.634	0.638	0.800	0.571
IA1	0.912	2.992	0.34	0.28				
IA3	0.810	1.793	0.35	0.30				
IA5	0.790	1.855	0.26	0.27				
IA9	0.807	1.926	0.31	0.28				
Interpersonal Adaptability		1.436	0.29	0.23	0.850	0.861	0.899	0.691
OPT1	0.847	1.312	0.49	0.34				
OPT4	0.663	1.166	0.47	0.35				
OPT5	0.743	1.276	0.38	0.29				
Optimism		1.706	0.46	0.35	0.625	0.666	0.797	0.570
SCOMP2	0.728	1.267	0.37	0.35				
SCOMP3	0.831	1.361	0.36	0.34				
SCOMP4	0.735	1.224	0.37	0.35				
Status Competitiveness		1.740	0.45	0.41	0.649	0.664	0.810	0.587

Discriminant Validity

In order to show the distinction between items (or a set of items) for the study constructs, discriminant validity tests were performed (Henseler et al. 2015). Based on the results in Table 1 it can be stated that there was discriminant validity at the item level due to the high correlation between items of the same construct, and a very weak correlation between items of the different constructs (Henseler et al. 2015).

In addition, as a new method for assessing discriminant validity in partial least squares structural equation modeling, Heterotrait-Monotrait ratio of correlations (HTMT) was applied (Henseler et al. 2015). According to these scholars, if the HTMT value is below 0.85, discriminant validity has been established between two reflective constructs. In this regard, based on the results in Table 2, the HTMT value was below 0.85 and as such, there was discriminant validity. The results are shown in Table 3.

Table 2. *Fornell-Larcker Criterion Results*

	Altruism	Interpersonal adaptability	Optimism	Status competitiveness
Altruism	0.756			
Interpersonal adaptability	0.533	0.831		
Optimism	0.472	0.539	0.755	
Status competitiveness	0.474	0.605	0.635	0.766

Table 3. *Heterotrait-Monotrait Ratio (HTMT) Results*

	Altruism	Interpersonal adaptability	Optimism	Status competitiveness
Altruism				
Interpersonal adaptability	0.701			
Optimism	0.704	0.712		
Status competitiveness	0.712	0.807	0.767	

Further, according to Gefen and Straub (2005), discriminant validity is shown when each measurement item correlates weakly with another construct except for the ones to which it is theoretically associated. Based on results of the cross loadings below, it can be stated that there was discriminant validity amongst the study constructs since each measurement item correlated weakly with another construct except for the ones to which it is theoretically associated. The results in Table 4 indicate discriminant validity based on the cross loadings.

Table 4. *Cross Loadings*

	Altruism	Interpersonal adaptability	Optimism	Status competitiveness
ALT1	0.768	0.470	0.447	0.416
ALT6	0.754	0.311	0.336	0.275
ALT7	0.746	0.400	0.260	0.359
IA1	0.502	0.912	0.522	0.553
IA3	0.470	0.810	0.414	0.510
IA5	0.376	0.790	0.330	0.455
IA9	0.411	0.807	0.505	0.487
OPT1	0.447	0.509	0.847	0.588
OPT4	0.270	0.320	0.763	0.405
OPT5	0.323	0.360	0.743	0.417
SCOMP2	0.283	0.415	0.443	0.728
SCOMP3	0.400	0.531	0.569	0.831
SCOMP4	0.397	0.435	0.435	0.735

Results

Descriptive Statistics

We relay the descriptive statistics the characteristics of the respondents, and hotels that were surveyed. This is as follows:

Characteristics of the Respondents and Response Rate

The average age range of the respondents was 20-25 years. Results revealed that 67% of the respondents were male and 33% were female. In total, the final sample constituted three hundred and three respondents (303).

The survey attained a 90% response rate from the units of inquiry that were Uganda Hotel staff. This was only possible because the investigator requested respondents to spare some time to fill the questionnaires and indeed made many follow-up trips to the selected hotels. Otherwise, the hotel staff were ever busy that it became very hard to secure 100% response rate.

Characteristics of the Hotels Surveyed

The number of hotels that finally constituted the sample was seventy (70). Their characteristics are reported in terms of: number of years that the hotel had been in existence, the number of rooms that the hotel possessed, the number of employees that the hotel had employed at the time of the investigation and its form of ownership. This was in terms of whether it was government or private. Table 5 breaks them down as follows.

Table 5. Characteristics of the Hotels Surveyed

No.	Item	Ranges	Sub total	Total
1	No. of years in existence	Less than 10	27	70
		Between 11-20	20	
		Between 21-30	23	
		Above 31	10	
		Total		
2	No. of rooms	Less than 40	20	70
		Between 50-100	25	
		Between 101-150	15	
		Above 150	10	
		Total		
3	No. of employees	Less than 20	20	70
		Between 21-40	10	
		Between 41-60	35	
		Above 60	5	
		Total		
4	Ownership	Government	0	70
		Private	70	
		Total		

Source: researcher's computation.

Correlation Analysis Results

Table 5 presents the means, standard deviations and zero order correlations amongst the study constructs. This is because means depict a summary of the data, whereas standard deviations indicate how well the means represent the data (Field 2009). In light of the above, it can be argued that given the small standard deviations relative to the mean, the data and the attendant results represent the true reality.

Furthermore, in order to establish the relationship between employee optimism, status competitiveness, interpersonal adaptability and employee altruism amongst Uganda hotels' staff, we first examined zero-order correlations coefficients (Table 5) between the variables. At this level of analysis, we established that the correlations between employee optimism and interpersonal adaptability are positively and significantly correlated ($r=0.533$, $p=0.01$); the same is for employee optimism and status competitiveness ($r=0.472$, $p=0.01$); employee optimism and employee altruism ($r=0.474$, $p=0.01$); interpersonal adaptability and status competitiveness were positive and significantly related ($r=0.539$, $p=0.01$); interpersonal adaptability and employee altruism ($r=0.605$, $p=0.01$); and status competitiveness and employee altruism ($r=0.635$, $p=0.01$).

Hypotheses Testing

In order to test for the direct and indirect relationships as indicated in our hypothetical model, Smart-PLS 3.2 was applied (Henseler et al. 2015). In return, bootstrapping was equally applied so as to specify the standard errors and t-statistics. To determine the path's importance, the validity of the Partial Least square-structural equation model (PLS-SEM) was assessed based on the path

coefficients and the significance of the path coefficients and the significance level. The resulting p-values were obtained using SmartPLS by using the bootstrapping process and calculating the p-value for each path. Path coefficients and significance levels were determined by randomly sampling 5,000 instances into the model. The results are presented in Table 6 which is supported by Figure 1.

Table 6. Means, Standard Deviations (SD) and Zero Order Correlations

Study variables	Means	SD	1	2	3	4
Employee Optimism (1)	4.41	0.68	1			
Interpersonal adaptability (2)	4.42	0.75	0.533**	1		
Status competitiveness (3)	4.40	0.65	0.472**	0.539**	1	
Employee Altruism (4)	4.12	0.54	0.474**	0.605**	0.635**	1

**Correlation is significant at the 0.01 level (2-tailed); n=303.

Figure 1. PLS-SEM for Employee Altruism

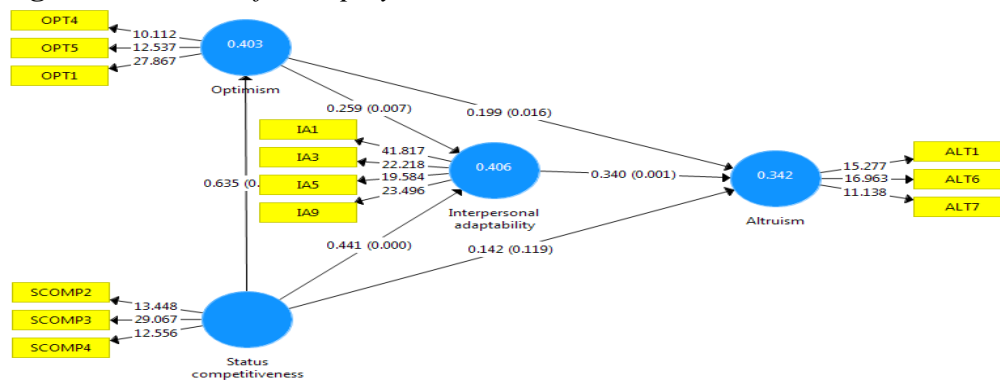


Figure 1 shows the results of the t-values of the outer model factor loadings and the inner model path coefficient and p-values. The size of the arrows represents the absolute value of each path. Table 6 summarizes the results of each proposed hypothesis.

The results show that there is a positive and significant relationship between interpersonal adaptability and employee altruism ($\beta=0.340$, $p=0.001$, t-values=3.445 with effect size of 0.104). Also, a positive and significant relationship between optimism and altruism ($\beta=0.199$, $p=0.016$, t-values=2.417 with effect size of 0.034), employee optimism and interpersonal adaptability ($\beta=0.259$, $p=0.007$, t-values=2.690). Additionally, we established that status competitiveness is positively and significantly associated with interpersonal adaptability and optimism ($\beta=0.441$, $p=0.000$, t-values=5.072, with effect size of 0.195; $\beta=0.635$, $p=0.000$, t-value=10.519, with effect size of 0.676) but not significantly related with altruism ($\beta=0.142$, $p=0.119$, t-value=1.562, with effect size of 0.015). Further, in terms of the predictive accuracy, coefficient of determination (R^2), the exogenous variables (interpersonal adaptability, status competitiveness and employee optimism,) explain 34.2% of the endogenous factor (employee altruism) which is considered a moderate effect and further supports our model's in-sample model fit (Hair et al. 2017). Hair et al. (2017) recommend that any predictive variance above zero (0) shows predictive relevance, as presented in Table 6.

Mediation Test Results

To test for these indirect relationships, we followed Cepeda-Carrion et al.'s (2018) recommendations. Based on these guidelines, results presented in Tables 7 and 8 show that interpersonal adaptability has a positive and significant mediating effect in the relationship between status competitiveness, employee optimism and employee altruism ($\beta=0.150$, $p=0.006$; $\beta=0.088$, $p=0.042$), with variance accounted for (VAF) of 31.65% and 30.66% in that order, confirming our theorized indirect relationship of status competitiveness, employee optimism and employee altruism through interpersonal adaptability. Additionally, employee optimism has a positive and significant mediating effect in the relationship between status competitiveness, altruism and interpersonal adaptability ($\beta=0.126$, $p=0.017$; $\beta=0.164$, $p=0.006$) with VAF of 26.58% and 27.11% respectively. This confirmed our theorized indirect relationship of status competitiveness, altruism and interpersonal adaptability through optimism. This implies that optimism plays a complementary partial mediating role between status competitiveness, altruism and interpersonal adaptability.

Table 7. Results of the Direct Hypotheses Tested

Direct Path	β	S. D	T Stat	P Values	f
Interpersonal adaptability -> Altruism	0.340	0.099	3.445	0.001	0.104
Optimism -> Altruism	0.199	0.082	2.417	0.016	0.034
Optimism -> Interpersonal adaptability	0.259	0.096	2.690	0.007	0.067
Status competitiveness -> Altruism	0.142	0.091	1.562	0.119	0.015
Status competitiveness -> Interpersonal adaptability	0.441	0.087	5.072	0.000	0.195
Status competitiveness -> Optimism	0.635	0.060	10.519	0.000	0.676
R Square	R Square	R Square Adjusted			
Altruism	0.342	0.334			
Interpersonal adaptability	0.406	0.401			
Optimism	0.403	0.401			

Table 8. Mediation Test Results

Direct Path	β	S.D	T Stat	P Values	
Interpersonal adaptability -> Altruism	0.340	0.099	3.445	0.001	
Optimism -> Altruism	0.199	0.082	2.417	0.016	
Optimism -> Interpersonal adaptability	0.259	0.096	2.690	0.007	
Status competitiveness -> Altruism	0.142	0.091	1.562	0.119	
Status competitiveness -> Interpersonal adaptability	0.441	0.087	5.072	0.000	
Status competitiveness -> Optimism	0.635	0.060	10.519	0.000	
Indirect Path	β	S. D	T Stat	P Values	VAF %
Optimism -> Interpersonal adaptability -> Altruism	0.088	0.043	2.041	0.042	30.66%
Status competitiveness -> Interpersonal adaptability -> Altruism	0.150	0.054	2.757	0.006	31.65%
Status competitiveness -> Optimism -> Altruism	0.126	0.053	2.391	0.017	26.58%
Status competitiveness -> Optimism -> Interpersonal adaptability	0.164	0.060	2.742	0.006	27.11%
Total Effects	β	S. D	T Stat	P Values	
Interpersonal adaptability -> Altruism	0.340	0.099	3.445	0.001	
Optimism -> Altruism	0.287	0.091	3.169	0.002	
Optimism -> Interpersonal adaptability	0.259	0.096	2.690	0.007	
Status competitiveness -> Altruism	0.474	0.066	7.194	0.000	
Status competitiveness -> Interpersonal adaptability	0.605	0.053	11.458	0.000	
Status competitiveness -> Optimism	0.635	0.060	10.519	0.000	

Discussion

The central objective of this investigation was to examine the predictive relationship between employee optimism, status competitiveness interpersonal adaptability and employee altruism under the current COVID-19 pandemic. Findings reveal that there is a positive and significant relationship between employee optimism, interpersonal adaptability and altruism; status competitiveness, interpersonal adaptability and employee altruism; status competitiveness, employee optimism and employee altruism; and status competitiveness, employee optimism and interpersonal adaptability. These results have the following implications in the context of Uganda hotels:

Employee Optimism, Interpersonal Adaptability and Altruism

Results indicate that there is a positive and significant relationship between employee optimism and employee altruism; employee optimism and interpersonal adaptability; interpersonal adaptability and employee altruism; employee optimism, interpersonal adaptability and employee altruism; and that interpersonal adaptability mediates in the relationship between employee optimism and employee altruism. This finding is supported by the works of Xiao et al. (2020) who argue that workplace friendship is the manifestation of interpersonal relationships in the workplace, which in turn, raise the emotions that workers have and the need to help each other. As applied to the context, these relationships imply the following.

Employees that have positive expectations in whatever they do with and for the organization, are bound to ensure that they go out of their way to foster the general welfare of those in need without expecting to be paid. In other words, Uganda hotels' staff who are optimistic that they will succeed, even when faced with major challenges as those conditioned by the COVID-19 pandemic, will always help others who have heavy workloads at their places of work regardless of the COVID-19 pandemic challenges. Further, it means that under uncertain times such as the COVID-19 pandemic, staff that usually expect the best from their hotels will always willingly give off their time to help others who have work-related problems in their workplaces.

Staff that derive positive expectations in all that they do for their employer will always blend with others, regardless of the challenges they are undergoing under the COVID-19 pandemic. In other words, hotel staff in Uganda that find it easy to relax while at their workplaces will always try to understand the viewpoints of their counterparts so as to improve their interaction with them, regardless of the prevailing challenges conditioned by the COVID-19 pandemic. Further, it means that staff of Uganda hotels that are dedicated to doing well for their hotels regardless of the challenges that they undergo such as those associated with COVID-19 pandemic, are always willing to adapt their work practices to the requirements and suggestions of their colleagues. The purpose will always be to ensure that they keep doing well for their own benefit and the employer.

Employees that have the ability to interact with one another freely can easily be able to offer help to one another regardless of the challenges they undergo

during the COVID-19 pandemic. In other words, Uganda hotels' staff that do not consider negative comments about their work very important so as not to get derailed, are likely to offer orientation to new employees of the hotels, even though it is not required by the hotels that employ them, let alone the fact that they are undergoing stringent conditions under this COVID-19 pandemic. In addition, this means that Uganda hotels' staff that regard the act of developing good relationships with all their counterparts as an important factor for them to be effective regardless of the COVID-19 pandemic situation, will always offer help that is intended to make their colleagues become more productive. This finding is in part supported by the scholarly works of Yin et al. (2018), who argue that workplace friendship can positively affect employees' attitudes toward work and as such, their mates.

Employees who interact with one another freely, will always have positive expectations in whatever they do regardless of the COVID-19 pandemic situation, so as to be able to offer help to others in need. In other words, hotel staff that freely relate with one another, will always have positive expectations in whatever they do regardless of the COVID-19 pandemic situation. In turn, this will always make them ready to offer assistance to one another at all costs. In support of this relationship, Yin et al. (2018) have humbly argued that workplace friendship cannot be existent without such employee perceptions of optimism, interpersonal adaptability and selfless behaviors towards one another. Relatedly, it means that Uganda hotels' staff that try to understand the viewpoints of their counterparts so as to improve their interaction with them, are always optimistic that they will succeed, even when faced with major challenges such as those associated with the COVID-19 pandemic. In return, such staff can easily offer help to others so as to make them more productive.

These findings are supported by existing theories such as the interpersonal theory (Kiesler 1996). This theory is derived from the notion of interpersonal reciprocation. It maintains that people in a relationship choose to behave in such ways that maintain or reflect similar previous actions and expectations towards each other. This implies that the actions of one party in a relationship simply depict and reaffirm what the other did before. The result is a relationship characterized by give and return behaviors amongst the interactants. Under such a relationship, there is inherent constructive interactions (interpersonal adaptability), given the reciprocal interactions (optimism) since the positive actions of one party inevitably build similar positive expectations from another. Hence, the need to offer help to each other at all costs without expecting a reward becomes a norm (altruism). This is how interpersonal theory anchors the relationship between interpersonal adaptability, employee optimism and employee altruism. To date, there is a dearth of literature to attest to this relationship.

Status Competitiveness, Interpersonal Adaptability and Employee Altruism

Results indicate that there is a positive and significant relationship between status competitiveness and employee altruism; status competitiveness and interpersonal adaptability; interpersonal adaptability and employee altruism; status

competitiveness, interpersonal adaptability and employee altruism; and that interpersonal adaptability mediates in the relationship between status competitiveness and employee altruism. These findings could be supported by Anjum et al. (2019) who argue that when there is a high level of friendship amongst workers in an organization (interpersonal adaptability), employees respond by resurrecting their emotional needs (such as being optimistic), and will continue working in the organization in any capacity of choice (status competitiveness) and inevitably wanting to help each other at all costs (altruism). These findings further imply the following.

This implies that Uganda hotels' staff that are convinced that competition for any status in the structures of the hotels is guaranteed, will always be available to offer help intended to improve the welfare of others in their organization regardless of the COVID-19 pandemic situation. In addition, this means that staff that believe that their status at work depends on their performance in relation to others are likely to help others so as to make them become more productive regardless of the COVID-19 pandemic situation.

This means that Uganda hotels' staff that believes that promotions in their hotels are only given when one outperforms others, can easily try to understand the viewpoints of their counterparts so as to improve their interaction with them regardless of the COVID-19 pandemic situation. Further, it means that Uganda hotels' staff that believe that they can only be able to obtain high status if they outperform their coworkers, easily develop good relationships with most, if not all, of their counterparts as an important factor for their effectiveness regardless of the COVID-19 pandemic situation.

Uganda hotels' staff that do not consider negative comments about their work to be very important, will always believe that occupation of any status in their hotels depends on one's performance relative to others, regardless of the COVID-19 pandemic situation. In return, such staff is bound to offer help to others who have heavy workloads in their workplaces. In addition, Uganda hotels staff who believe that developing good relationships with most, if not all, of their counterparts is an important factor of their effectiveness, are likely to believe that only the best employees can obtain high status at work regardless of the COVID-19 pandemic situation and these can offer help to others make them more productive. This relationship is supported by Yu et al. (2021) who argue that workplace friendship results in the achievement of an individual's emotional needs in the organization, knowledge sharing, mutual help among workmates, harmonious working atmosphere characterized by mutual trust and love. This ultimately increases resource investment in extra-role behavior.

Theoretically, these findings are equally supported by the social comparison theory (Festinger 1954). This theory argues that there is always an element of competition in a social system for people to either raise or maintain particular social statuses in an organization. This means that once the spirit of competition is accepted as a norm in an organization, there is a possibility for members to relate easily with one another so that they can even go beyond the call of duty by way of being able to offer help to others so that their welfare can be improved. This is the extent to which status competitiveness, interpersonal adaptability and employee

altruism can be anchored by the social comparison theory (Festinger 1954). In the same breath, there is limited empirical evidence to support these findings.

Status Competitiveness, Employee Optimism and Employee Altruism

Results indicate that there is a positive and significant relationship between status competitiveness and employee altruism; status competitiveness and employee optimism; employee optimism and employee altruism; status competitiveness, employee optimism and employee altruism; and that employee optimism mediates in the relationship between status competitiveness and employee altruism. This finding is supported by Wei et al. (2019) who argue that a positive emotional state in employees has a direct effect on their work attitude and thoughts. In turn, this affects their extra role behaviors. These findings have the following implications:

Once Uganda hotels' staff comes to believe that formal titles such as director of human resource management, manager outside catering etc., are contingent on one's performance relative to others in their hotels, then, staff become optimistic that they will succeed even when faced with major challenges such as the ones associated with the COVID-19 pandemic. Further, as long a Uganda hotels' staff is convinced that ranks and privileges are based on outperforming others in their respective hotels, then they are likely to become dedicated to doing well their work.

This finding equally means that whenever Uganda hotels' staff is convinced that responsibilities in their hotels are delegated based on one's performance relative to others, then it is likely that their formal actions will be associated with a sense of profound purpose regardless of the COVID-19 pandemic situation. In return, such staff cannot avoid helping others who have been absent from their work stations for genuine reasons. In addition, as long as Uganda hotels' staff believe that everybody must compete for every prestigious position in their hotels regardless of the COVID-19 pandemic situation, they are likely to become dedicated to doing well in their work. In return, such staff is bound to willingly give off their time to help others who have work-related problems in their hotels.

Theoretically, these findings are equally supported by the social comparison theory (Festinger 1954). This is because, as argued before, this theory maintains that there is always an element of competition in a social system for people to either raise or maintain particular social statuses in an organization. This implies that with the acceptance of a spirit of competition in an organization, members can then have positive expectations in what they do for the organization. This in return, makes them offer help to each other given the justice associated with the spirit of competition in the organization.

Status Competitiveness, Employee Optimism and Interpersonal Adaptability

Results equally indicate that there is a positive and significant relationship between status competitiveness and interpersonal adaptability; status competitiveness and employee optimism; employee optimism and interpersonal adaptability; status competitiveness, employee optimism and interpersonal adaptability; and that

employee optimism mediates in the relationship between status competitiveness and interpersonal adaptability. Given that most of what this relationship implies has been discussed above, what remains is the inherent relationship between status competitiveness, employee optimism and interpersonal adaptability and the extent to which employee optimism mediates in this relationship.

Uganda hotels' staff convinced that ranks and privileges are based on outperforming others in their respective hotels regardless of the COVID-19 pandemic situation, are likely to become dedicated to doing well in their work and can adjust their work practices if someone points out a better solution. Uganda hotels' staff need to be optimistic that they will succeed, even when faced with major challenges such as those associated with the COVID-19 pandemic, for them to develop a feeling that they are able to obtain high status if they outperform their coworkers. In doing so, they are bound to adjust their work practices if someone points out a better solution to any challenge they face while working. This could be supported by Wei et al. (2019) who allude to the argument that employees that are optimistic, have improved work attitudes and thoughts. In return, this brings about employee altruism as a form of extra role behaviors.

Theoretically, these findings are as well-supported by the social comparison theory (Festinger 1954) and the interpersonal theory (Kiesler 1996). This is because the spirit of competition guarantees positive expectations among staff of an organization, and this in turn could make them interact meaningfully amongst each other as advanced by the interpersonal theory. However, in the same breath, there is limited empirical evidence to support these findings.

Conclusions

This paper presents an examination of the relationship between employee optimism, status competitiveness interpersonal adaptability and employee altruism. Based on the findings of the study, it can be concluded that staff that is optimistic that they will succeed, even when faced with major challenges such as those associated with the COVID-19 pandemic, can try to understand the viewpoints of their counterparts so as to improve their interaction with them. This tendency makes them ready to offer help to others so as to make them more productive.

In order for staff to believe that occupation of any status in their organization depends on one's performance relative to others, they need at times to disregard the majority of the negative comments made by others because they have a duty to offer help to others who have heavy workloads in their workplaces regardless of the COVID-19 pandemic situation.

Staff needs to believe that each and everybody must compete for every prestigious position in their organization regardless of the COVID-19 pandemic situation, if they are likely to become dedicated to doing well their work and interact with one another more meaningfully in the pursuit of organizational goals and objectives.

Staff needs to positively expect to succeed even in face of competition for the different positions in the organization particularly if a culture of offering help to

one another is to be nurtured in the organization regardless of the COVID-19 pandemic situation.

Implications of the Study

At a theoretical level, the interpersonal theory (Kiesler 1996), explains employee optimism, interpersonal adaptability and employee altruistic behaviors. In a constructive interpersonal relationship, there is inherent expectation for the best, based on previous experiences by the interactants, which the parties flexibly adjust to one another's ways of life and can be available to assist one another at all costs. However, the theory does not argue for interpersonal behaviors being competitive at all. This is because the actions of the interactants are voluntarily induced by the actions of the other (Kiesler 1996). Therefore, status competitiveness could be explained by the social comparison theory (Festinger 1954). This theory maintains that elements of competition exist in a social system so as to enable parties to rise or maintain a particular social status in an organization.

At policy level, regardless of the pandemic, the willingness and necessity to offer assistance to others in the same workplace should be explicit in the core values of the organization. This is why organizations need to be clear on how they foster positive expectations on the part of their employees, how they do not segregate any employee when it comes to competition for the positions in the structure when they fall vacant, and how they encourage positive interactions amongst their members. These ideals need to be documented and communicated explicitly so that they retain as much clarity necessary to induce their full implementation. This is because they have been found to impact essential employee altruistic behaviors.

Managerially, this is a direct invitation of supervisors in organizations to ensure that if employees are to sacrifice their resources for the sake of others' welfare, there is a need for them to always have positive expectations in the actions of the organization, and they should be certain that they are free to compete for the various positions in the structure, have to be able and willing to interact freely with one another in the organization. This is because all these standards have been found to have an effect on the level of sacrifice that an employee can make to the welfare of the organization.

Study Limitations and Future Research Directions

In the explanation of employee altruistic behaviors, this study has specifically considered the role of employee optimism, interpersonal adaptability and status competitiveness. Future studies could explore the role of other factors in ensuring the growth and development of employee altruistic behaviors. Such factors as cultural adaptability, training and learning efforts, ability to deal with uncertain and unpredictable work situations, competitive recognition, co-worker competitiveness, and more, directly impact the willingness to sacrifice for others in the organization.

However, these have not been considered in the recent scholarly efforts intended to explain employee altruistic behaviors.

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Topics on Education

Thucydides and the Synchronous Pandemic

Gregory T. Papanikos

Thucydides survived the pestilence and gave a vivid portrayal of the Athenian Epidemic at the onset of the Peloponnesian War. He belongs to the rare group of historians who wrote history about events which had a personal experience. He was involved with the war (as an Athenian strategos) and with the epidemic (had survived an infection). His History of the Peloponnesian War is a textbook approach of how historical events and facts should be researched and described. His historical methodology is based on an orthological analysis of human behaviour. Such an approach enables the researcher to interpret existing stylized facts and personal involvements with reason and objectivity. Within this framework, this paper examines Thucydides exposition of the epidemic of 430 BCE by means of four hypotheses which underline his historical analysis of the pestilence. Then, I proceed with the verification of these hypotheses using the data generation process of the synchronous pandemic of 2020. My main conclusion is that despite technological progress made by human beings with the graceful assistance of Prometheus, human nature did not change as much as Thucydides so eloquently emphasized, prognosed and hoped. Evidence on synchronous pandemic supports Thucydides diagnosis of the human nature but does not vindicate him on the hypothesis (or may be his wish) that his history would be used by future generations to avoid making the same mistakes over and over again. So far, the same or similar faults seem unavoidable. It appears that these faults are embedded in human nature and cannot be avoided.

Keywords: *Thucydides, epidemic of 430 BCE, pandemic, human nature*

Prolegomena

This paper aims to discuss the epidemic which ravaged Athens in the summer of 430 BCE; one year after the start of the Peloponnesian War which lasted 27 years (431-404). Thucydides immortalized the epidemic. He mentioned that the contagious disease was fearsome; many died but an exact number was not given. Littman (2009) stated that 25% of the Athenian population died (between 75 and 100 thousand people) but no source is cited¹. Thucydides did make a reference to numbers when he described an unsuccessful military expedition of 4,000 Athenian soldiers to Potidaea. According to this (2.58), 1,500 or 37.5% of the soldiers died because of the disease. Earlier (1.23.3), he mentioned that the infectious disease (ἡ λοιμώδης νόσος) harmed (βλάψασα) the population but no numbers were given either. In his book of Pericles (*Parallel Bios*²), Plutarch said that at the beginning of the outbreak, Pericles led a military expedition to the Peloponnese. Many of

¹Shrewsbury (1950) used the same number and cited an earlier source of Webster (1915). Webster (1915, pp. 235–236) stated that “The pestilence spread like fire and slew at least one fourth of the inhabitants of Athens”. No source is cited here either.

²Plutarch (46 AD–119 AD) wrote comparative biographies of selected Greek and Roman. In the case of Pericles, his life is compared to that of Fabius Maximus.

his soldiers died from the disease but no statistics were given either. Thus, no one can quantify, with a certain degree of accuracy, the impact of the epidemic in terms of human losses. Later on (3.87), Thucydides himself made the same note, usually ignored by those who report numbers. Thucydides was very careful not to express qualitative assessments of historical facts as well, including social and political effects.

The epidemic lasted four years but its lethal effects occurred in two waves. The first in 430-429 BCE and the second in 427 BCE. According to Thucydides (3.87.1), however, the disease never disappeared (ἐκλιποῦσα μὲν οὐδένα χρόνον τὸ παντάπασι). There was a sort of a pause (ἐγένετο δὲ τις ὄμως διοκωχί) between the first and second wave. In the second spike, Thucydides (3.87.3) made a reference to numbers. He stated that the second wave was worse than the first because it killed no less (οὐκ ἐλάσσους) than 4,400 from the hoplites and 300 from the calvary (τετρακοσίων γὰρ ὀπλιτῶν καὶ τετρακισχιλίων οὐκ ἐλάσσους ἀπέθανον ἐκ τῶν τάξεων καὶ τριακοσίων ἱππέων). However, he was not able to provide a number for the rest of the masses (τοῦ δὲ ἄλλου ὄχλου) because it was undiscovered (ἀνεξεύρετος ἀριθμός). Besides this problem of numbers, Thucydides did provide a detailed chronicle of the other aspects of the disease which are examined in this paper.

The emphasis here is on the social and political effects of the epidemic rather than on its microbial origins and its epidemiological severity. These etiologies of the ancient Athenian epidemic are not examined but some references are made as long as they relate to individual, social and political issues and reactions at the level of society and polity. These issues include housing, population density, water supply, transportation restrictions, food supply and the quality of health services.

As mentioned, Thucydides' History of the Peloponnesian War is the only contemporary source³. He used an analytical historical method -presented below- but many other methods of analyses of the ancient Athenian epidemic have also been used to discern the causes of the outbreak. Recently, archaeological evidence has been employed taking advantage of the more recent sophisticated analyses of ancient DNA in preserved tissues⁴. Another source is the theatrical plays which described the plague and human reactions to it. These have been supplemented by

³In his book *Parallel Bios of Pericles*, Plutarch made a number of references to the ancient Athenian epidemic. He cited other works which unfortunately have not survived, such as Theophrastus *Ethics* (Ἠθικά). Nevertheless, even Plutarch himself based his *Pericles Bios* mainly on Thucydides. Most probably so also did others, since no one was a contemporary of Pericles. In these works, I do not include the work of various plays such as Aristophanes excellent trilogy on peace because they do not provide the information to evaluate the social and political aspects of the epidemic. For example, in the trilogy Aristophanes supports a peace agreement with Sparta but the majority of Athenians did not vote in favor in the Athenian *Ecclesia of Demos*.

⁴See among many other studies Manley (2013), Longrigg (1980), Littman (2009), Cunha (2004), Papagrigoarakis et al. (2006), Shapiro et al. (2006), Poole and Holladay (1979), Langmuir et al. (1985), Olson (1996), Brugg (1996), Dixon (1996), Holden (1996). Classicists along with medical scientists still debate today the exact cause of the plague. No consensus has been reached. Thucydides description of the disease which he contracted and survived himself is not sufficient to identify the medical cause and the nature of the infection. On the other hand, DNA tests have not helped either. The methodological problems are too severe to reach any definite conclusion.

philological criticisms⁵. There are many methodological problems with all these approaches, discussed in the relevant scientific literature⁶.

Apart from other problems, the historical analytical method suffers from "... translating any ancient foreign language are compounded by the fact that so many words in these languages have a variety of meanings. Additionally, due to the precision required in medical documentation, any word or phrase that is interpreted in a way other than that intended by the original author can skew a description toward or away from the actual diagnosis"⁷. In this paper, I use the original ancient text as the only source of information. The ancient relevant passages from Thucydides are cited but, in most cases, not literally (philologically) translated. Instead, the meaning or more accurately my own interpretation and understanding of it is outlined in the text.

My reading of Thucydides suggests that he was more interested in the social and political consequences of the epidemic rather than making a diagnosis of its pathology (origin) and nature; and this shaped the reporting of his narrative. My received view of the entire history of Thucydides (including the passages on the epidemic) is consistent with his historical methodological analysis. This historical method is examined in the next section of the paper. Subsequently four hypotheses are presented; all of which relate to the social and political consequences of the disease. Each hypothesis is, then, examined in a separate section. For each hypothesis, I dare to compare and verify it for its diachronical validity against the background of the synchronous pandemic. The last section of this paper concludes.

Thucydides' Historical Method and the Athenian Epidemic

Thucydides wanted to be useful, not congenial. He wanted to teach, not to please. His scope was to benefit not only his own generation but all future generations. He thought that it is in the nature of people to make the same mistakes over and over again. He also wanted to teach the eternal human race how to avoid repeating the same or similar mistakes⁸. This objective applied to his description of the epidemic of 430 BCE. He used this event to generalize in an inductive way about all future epidemics. Thus, those who would want to learn what really happened could benefit from reading his history: to learn not for the sake of learning but to be prepared for the future if the same situation

⁵See the discussion by Mitchell-Boyask (2009).

⁶A concise summary of this literature is given by Cunha and Cunha (2008).

⁷See Cunha and Cunha (2008, p. 4).

⁸The apparent contradiction between human nature and human learning on how to avoid mistakes was not mentioned by Thucydides. If mistakes were the result of ignorance, then learning is useful. However, if they are the result of "human nature", they cannot be avoided because as Thucydides himself claimed people do not differ much. This is true across all generations; current and future. It seems to me that Thucydides was not vindicated on this issue as I will demonstrate with the metaphysical (superstitious), social and political effects of the synchronous pandemic. The effects of the 2020 pandemic are very similar (*παραπλησίων ἔσεσθαι*) to those of the ancient Athenian epidemic. Nothing was learned, at least so far. After all, hope is what left in Pandora's Jar for the humanity to cherish.

arises. This is the crux of Thucydides historical analysis. He wrote a useful history. In his own masterful words (1.22.4), “...ὅσοι δὲ βουλήσονται τῶν τε γενομένων τὸ σαφὲς σκοπεῖν καὶ τῶν μελλόντων ποτὲ αὖθις κατὰ τὸ ἀνθρώπινον τοιούτων καὶ παραπλησίων ἔσεσθαι, ὠφέλιμα κρίνειν αὐτὰ ἀρκούντως ἔξει. κτήμᾳ τε ἐς αἰεὶ μᾶλλον ἢ ἀγώνισμα ἐς τὸ παραχρήμα ἀκούειν ζύγκεται”.

I like the word “ἀγώνισμα”. My interpretation is that Thucydides is ironic here because some of his colleagues wrote history to please an audience. He most probably meant Herodotus. As always then and now, the masses love to hear what they wanted to hear, e.g., they are the best and whatever they are doing is just and fair; the others (barbarians) are to be blamed.

He applied this approach in explaining the epidemic of 430 BCE. Thucydides, main description of the epidemic started right after Pericles’ *Funeral Oration*, delivered to honor those who died during the first year of the Peloponnesian War. The relevant sections are from 2.47.1 to 2.65.13 of his book. However, as I have already stated, the epidemic was also mentioned in previous and later chapters. Reading these passages, I believe that Thucydides’ scope was to teach us, i.e., what to expect when the same (τοιούτων) or similar (παραπλησίων) things happen (ἔσεσθαι).

The synchronous pandemic of 2020 can be considered a similar one if not the same event at least in terms of its individual, social and political effects all of which are examined in this paper. What can we then learn from Thucydides’ historical analytical account of the ancient Athenian epidemic and how does this compare with the synchronous pandemic? How did ancient Athenians react to the spread of the disease? These questions were not only sophisticatedly addressed by Thucydides but became, as he wished, a possession (κτῆμα) for all future generations to take advantage of it.

My approach (or better my own tactical method) of reading Thucydides is as follows. I view Thucydides’ historical account as a series of testable hypotheses which can be verified (supported or rejected) against the background of similar events (facts) destined to ensue again. I apply this approach to the synchronous pandemic by developing four testable hypotheses. Thucydides thought they had a diachronical validity. The reason (νομίζειν) is that a human being (ἄνθρωπον) does not differ much (πολύ τε διαφέρειν οὐ δεῖ) from another human being (ἄνθρωπου) (1.84.4).

Thus, we may conclude that people will react the same way in the synchronous pandemic as did Athenians in 430 BCE. Is this the case? This paper aims to answer this question using the aforementioned hypotheses. These hypotheses are analyzed in the following sections of this paper. In the next section, though, I give a brief chronology of the epidemic based on Thucydides’ “journalistic” account of it.

The Chronicle of the Epidemic of 430 BCE

After the victorious Persian Wars, in the first two decades of the 5th Century BCE, Athens and Sparta were locked into what Graham Allison termed the

“Thucydides Trap”⁹. The relevant passage is found in 1.23.6 “... τὴν μὲν γὰρ ἀληθεστάτην πρόφασιν, ἀφανεστάτην δὲ λόγῳ, τοὺς Ἀθηναίους ἠγοῦμαι μεγάλους γιγνομένους καὶ φόβον παρέχοντας τοῖς Λακεδαιμονίοις ἀναγκάσαι ἐς τὸ πολεμεῖν· αἱ δ' ἐς τὸ φανερόν λεγόμεναι αἰτίαι αἱ δ' ἦσαν ἑκατέρων, ἀπ' ὧν λύσαντες τὰς σπονδὰς ἐς τὸν πόλεμον κατέστησαν”.

However, what Thucydides termed openly alleged causes (“φανερὸν λεγόμεναι αἰτίαι”) of the war which discussed in section 1.24.1 and thereafter are very pragmatic reasons to enter into a war. So, what Thucydides stated that was the “Thucydidian Trap” was not what Allison claimed to be. Thucydides said that the war started because of the fear of Sparta that Athens would become great and overpower them. Spartans, therefore, had no other choice but to enter into war. However, a careful reading of Thucydides history would reveal that it was not the fear *per se* but a very solid and real economic reasoning of antithetical (economic) interests which brought the two cities and their allies into fierce antagonism and eventually into a war. As a matter of fact, after the Persian defeat, the entire 5th Century BCE is characterized as a period of war between Athens and Sparta or their allies with short periods of truce. The idea that wars are always the result of economic conflicts was a common belief in the times Thucydides wrote his history. For example, in his book *Phaedo* (c. 380 BCE, 66c), Plato writes that “Διὰ τὴν τῶν χρημάτων κτῆσιν πάντες οἱ πόλεμοι γίνονται”. All the wars are made to acquire money.

The war then was inevitable. Despite a 30 years peace agreement, signed in 445 BCE, the famous war broke out in 431 BCE and lasted, with some intermissions, 27 years. Athens was defeated but not because of the epidemic. Some claim that if the disease had not killed Pericles, he would have led them to a victorious result. If! However, as Pericles himself claimed -cited by Plutarch-, his military achievements were the result of good fortune. If this were true (and I believe was true), then Pericles was not indispensable. After all Pericles could have been killed in one of the many battles he gave against the enemies of Athens. By 404, if not earlier, the epidemic had been long since forgotten.

As a matter of fact, when Nicias was addressing the *Ecclesia of Demos* in 415 BCE, arguing against the opportunistic and perilous expedition to Sicily, he reminded (6.12.1) the Athenians that they had just recovered from the great disease and the war (Καὶ μεμνησθαι χρὴ ἡμᾶς ὅτι νεωστὶ ἀπὸ νόσου μεγάλης καὶ πολέμου βραχὺ τι λελωφῆκαμεν) which increased both state revenues and the population of Athens (ὥστε καὶ χρήμασι καὶ τοῖς σώμασιν ἠὺξῆσθαι).

But Nicias could not persuade the Athenian Demos; they decided to send the army and navy to Sicily and actually under the military leadership of Nicias himself who was left alone after Alcibiades deserted to Sparta. Thucydides said (6.26.2) that Athenians were preparing their expedition because now they had accumulated public funds due to the truce and had soldiers at their disposal because many of the youth of Athens came of age to serve as soldiers (ἄρτι δ' ἀνειλήφει ἡ πόλις ἑαυτὴν ἀπὸ τῆς νόσου καὶ τοῦ ξυνεχοῦς πολέμου ἕξ τε ἡλικίας πληθὸς ἐπιγεγεννημένης καὶ ἐς χρημάτων ἄθροισιν διὰ τὴν ἐκεχειρίαν, ὥστε ῥᾶον πάντα ἐπορίζετο. καὶ οἱ μὲν ἐν παρασκευῇ ἦσαν).

⁹See Allison (2015).

Thus, after 12 years Athenians had fully recovered and were able to undertake a dangerous military expedition that Pericles had so many times warned them against. Therefore, the loss of the war ten years later cannot be blamed on the epidemic. I am not sure if one could even blame it on the disastrous expedition to Sicily but the causes of the defeat are not my subject here.

One year after the war had started, in the beginning of the summer of 430 BCE, Sparta and their allies invaded again the land of Attica and camped outside its Long Walls. As in the previous year, they started their catastrophic praxes on the rural arable land of the surrounding areas of Athens known as Attika. After not many days, the disease (νόσος) was born (γενέσθαι) among the Athenians (τοῖς Ἀθηναίοις).

At this point, Thucydides gave some information. My reading has been as follows. It was said (λεγόμενον) -not by him- that such a pestilence (λοιμός) was not something new and appeared before (πρότερον) in other places. He mentioned explicitly the island of Lemnos. But now there was a difference. All those who remembered or knew about previous outbreaks said that this was by far the most contagious and lethal epidemic. But this is a very common popular perception. What people encounter is always worse what they had experienced in the past.

On this issue, Thucydides was not helpful. He did not tell the future generations why Lemnos was explicitly mentioned. Perhaps here Thucydides acted as a “journalist” and reported what some Athenians said and discussed. Most probably some Athenians had a first-hand experience of a similar epidemic in Lemnos and this information was disseminated at the time. Thucydides used the word “ἐμνημονεύετο” which means that some Athenians carried this information in their “memory”. I interpret it that they had experienced the disease.

True or not, Thucydides did not take any stance on this issue. At this point, it is clear that he did not blame Lemnos or any other places. It seems that the plague of Athens was not related to the plague in those other places. The only conclusion that one draws from this is that some Athenians knew that such epidemics could occur because it happened in the past. So, they had learned their lesson and presumably they knew how infectious it could be and most importantly that it could be over in a few years.

Then, Thucydides continued with another “journalistic” report on what people thought of the origin of this epidemic. This is discussed in a following section of this paper. At the end of section 2.48, Thucydides stated that he was going to give an account of the symptoms of the plague so that if this happened again, the future generations will know. He based his description on his own experience with the disease because had not just suffered through a case of the illness, but had also been a part of the community of victims, family, urban neighborhood, that had survived and been marked by the experience: “...ταῦτα δηλώσω αὐτός τε νοσήσας καὶ αὐτὸς ἰδὼν ἄλλους πάσχοντας”.

I am not going to state the symptoms described by Thucydides. I have already mentioned many works which presented and discussed these symptoms. No consensus has been reached. The nature and the medical cause of the disease are still debatable. There is only one-way to find out: if the same epidemic appears again, people will know. This is exactly what Thucydides told us. In his own

words, “...ἐγὼ δὲ οἶόν τε ἐγίγνετο λέξω, καὶ ἀφ' ὧν ἂν τις σκοπῶν, εἴ ποτε καὶ αὐθις ἐπιπέσοι, μάλιστ' ἂν ἔχοι τι προειδὼς μὴ ἀγνοεῖν”.

The meaning of this elegant excerpt is that Thucydides had only one scope (σκοπῶν). In case that this epidemic struck in the future (εἴ ποτε καὶ αὐθις ἐπιπέσοι), people will know and they will not ignore it (μὴ ἀγνοεῖν). This justification is consistent with the Thucydidian historical analytical method. But it may also be interpreted that, at least in the beginning, Athenians had underestimated the lethality of the disease. It seems that as a hypothesis is verified today by the initial reactions of some countries to the synchronous pandemic. As in ancient Athens, some countries today have ignored the synchronous pandemic despite Thucydides' warning of “μὴ ἀγνοεῖν”¹⁰. But many other testable hypotheses can be derived from Thucydides' historical interpretation of the ancient epidemic. These are discussed in the following sections.

The Thucydidian Hypotheses About Pandemics

My reading of the relevant passages on the ancient epidemic of 430 BCE is in the form of testable hypotheses using the historical analytical method. I assume that Thucydides developed a number of hypotheses; even though he did not mention them explicitly. I have categorized these hypotheses into four groups.

H1: Blame it on Foreigners and Enemies

H2: An Epidemic has Different Individual Effects

H3: An Epidemic Gives Rise to Metaphysical Explanations

H4: An Epidemic has Social and Political Consequences

In the following sections of this paper, I discuss separately each one of the above hypotheses.

Blame it on Foreigners and Enemies

I have already mentioned in the previous section that Thucydides said that Athenians knew that the same epidemic hit other areas as well, such as Lemnos, but no casual connection was made between these places and the epidemic that ravaged Athens in the summer of 430 BCE.

Instead, Thucydides cited two different sources from which Athenians thought the epidemic may come from. The first were the barbarophones as Homer would call them. According to the Thucydidian narration, as it was said (ὡς λέγεται), the epidemic first started in Ethiopia in the upper Egypt (most probably in modern Sudan); it went down to Egypt and Libya and then it outspreaded in the entire Kingdom. And suddenly (ἐξαπναιίως) struck (ἐσέπεσε) Athens but not all at once. It first started in Piraeus and then came to the upper city (ἐς τὴν ἄνω πόλιν

¹⁰A reader may point out that nobody reads Thucydides under the current calamity of the pandemic. On the contrary, there many articles in the international press which compare the ancient Athenian epidemic with the current pandemic. Thucydides would respond that it is in the human nature not to learn from past mistakes or experiences.

ἀφίκετο) of Athens. By the time it spread throughout the city, too many had already died (ἔθνησκον πολλῶ μᾶλλον ἤδη). Unfortunately, as previously mentioned, Thucydides did not give a number because it was unknown.

But there was a second theory which was said (ἐλέχθη) during that time. Athenians blamed it on the Peloponnesians who threw (ἐσβεβλήκουεν) the virus (φάρμακα) into the wells (ἐς τὰ φρέατα) of Piraeus which were used as drinking water because the area did not have fountains. And this relates to the fact that the epidemic started in Piraeus; then it spread throughout the city.

It seems to me that Thucydides did not accept any of these two allegations. He used the terms “as is said” (ὡς λέγεται) for those with a xenolalia and “was said” (ἐλέχθη) for the Peloponnesians¹¹. Thucydides was a rational thinker and would never accept such explanations as the real causes of a natural phenomenon like an epidemic. I think the dominant explanation was the first one because it persisted as an explanation and was still used at the time when Thucydides was writing on the Peloponnesian War. On the other hand, the other explanation most probably did not stand the test of time. Does this mean that Thucydides had adopted the former over the latter? Did he himself blame the barbarians over the fellow Peloponnesians? I do not think so at all. From an historical analytical point of view, the first hypothesis was difficult or impossible to verify. On the other hand, the second hypothesis was easily verifiable. Most probably there were many others drinking water from the wells of Piraeus and not infected. So, this hypothesis collapsed as a valid explanation¹².

I do believe that Thucydides did not adopt either explanation. Just in the next sentence, after reporting the two explanations, he questions both rumors. Thucydides wrote that everyone (ὡς ἕκαστος) said (λεγέτω) whatever he knew (γιγνώσκει) as logical or correct (εἰκὸς ἦν) which gave rise to this (γενέσθαι αὐτό). Such people included both physicians and ignorants (καὶ ἰατρὸς καὶ ἰδιώτης). He highlighted the ignorance of these epidemics, i.e., the speculation on the real causes of such diseases which in essence change the nature of things (καὶ τὰς αἰτίας ἄστινας νομίζει τοσαύτης μεταβολῆς ἱκανὰς εἶναι δύναμιν ἐς τὸ μεταστῆσαι σχεῖν).

Thucydides said in this sentence that he could not explain the nature of the disease. Instead, what he could offer to the humanity was his own account of the plight because he was infected (and survived) and he had seen many others who were infected. He provided an excellent description of the symptoms but it seems that they are not sufficient for the modern virologists or epidemiologists to elucidate what was this epidemic all about. The issue is still debated. Thucydides' indirect admission that he could not tell anything about its causes (τὰς αἰτίας) shows that his history writing is based on logic and reason and not on what was

¹¹On the use of the word *λέγεται* and the different varieties by Thucydides see Westlake (1977). On page 347 he explains the use of the word as follows “Few difficulties are presented by passages in which Thucydides uses a *legetai* phrase in a past tense, such as *ἐλέχθη* or *ὡς ἐλέγετο*. In each passage he mentions a report or rumor current at the time which he cannot confirm or deny, though in most cases he is decidedly skeptical. He does not state the reason for his uncertainty, but it is more or less easily deducible from the context. His sources are undoubtedly oral”. This is exactly my reading of the relevant passages.

¹²The “blamed it on Spartans” did not live long. This is also supported by Gomme (1956).

said by ignorant people. If I may speculate about the nature of the epidemic, I would tend to agree with those who state that was something new which has not appeared yet again. If it reappears again, we would know it from Thucydides' excellent description of its symptoms.

Let me summarize this hypothesis. If an epidemic struck at a country, some people would blame it on foreigners. Is this hypothesis rejected by the synchronous pandemic?¹³ No, it is not. The richest nation on earth, the one which produces an immense amount of new knowledge by using scientific methods and reason, has a President who blamed the pandemic on China. The President of the USA did not call it a coronavirus but a Wuhan virus, from the area of China where the first symptoms appeared. Of course, China retaliated by stating that USA started it. The definition of barbarians is subjective. If you are Chinese, then the USA is barbarian. But if you are a US citizen, then it is the Chinese who are barbarians. So, blaming it on barbarians has stood the test of time as a hypothesis. It did not fade away.

Some take this hypothesis even further. They claim that this is part of a biological war. The soft version of this explanation alleges that this virus was born in the Chinese labs and it spread all over the world by a mistake. I heard the same thing about the HIV virus that was born in California Labs. Some even used this as an excuse to attack globalization. The strong version of this explanation is that this was not an accident. But there is a war of spies coming from all the big international political actors such as the USA, China, Russia etc. Even though I have read many journalistic reports about the role of spies in warning that a virus might generate a pandemic and/or the pandemic is instrumentalized by some countries in support of their international aspirations, I have seen the strong version of the explanation. As in Thucydides, I was only a bystander of discussions in downtown Athens (close to where Thucydides used to be present) who seemed to me they were adopting the argument of a biological war. When I pointed out that this was said in 430 BCE as an explanation of the ancient Athenian epidemic, nobody believed me.

As far as the first hypothesis is concerned, the current generation has not learned much from Thucydides warnings. One explanation might be that given by Thucydides himself: human nature does not change and people are similar if not identical across space and time.

An Epidemic Has Different Individual Effects

Epidemics and pandemics show that men and women are not the same. Both the symptoms of the disease differ as well as their attitudes towards it. Some are heroic and some run-away. Some are infected and they have an easy way out;

¹³I am not going to give any references to these sources. In many cases, these opinions have been covered up by "serious" think tanks. And the reason is not what they say but how they substantiate their argument. If someone says that the X country or the Y group of individuals spread the virus, they must have the evidence to support it. They do not. According to Thucydides they are the "idiots" in the English meaning of the word, which did not have the same meaning in Thucydides' time when it simply meant private individuals.

others suffer and even worst die from it. In the beginning, Thucydides described the common characteristics as symptoms of the epidemic (Τὸ μὲν οὖν νόσημα ... τοιοῦτον ἦν ἐπὶ πᾶν τὴν ιδέα). But there were differences among those infected. These variations, however, are not mentioned. My explanation is that Thucydides' purpose was not to explain the disease itself for two reasons. Firstly, he was not writing about the disease but about the history of the war. Also, if he had not been infected himself, I do not think he would have ever dedicated so many lines to write about it. Secondly, he did not know anything about its causes and pathology. Thucydides decided to skip (παρολιπόντι) the description of these additional symptoms which varied between individuals.

As mentioned, some people were able to survive while others did not. This could not be explained either. Pericles, his sister and his two sons did not make it. But Thucydides survived. There was no medicine (ἴαμα) that could cure the disease. Prometheus did not bring any vaccines. He had other priorities. He brought them later. Thucydides mentioned that medicines which cured made others worse. Even the quality of health care did not help either. Those who had good health care (θεραπευόμενοι) were dying along with those who had no care at all (ἀμελεία). All died irrespectively of the quality of health care they were receiving (...ἀλλὰ πάντα ξυνήρει καὶ τὰ πάση διαίτη θεραπευόμενα).

Thucydides observed that in the year of the epidemic (430 BCE), Athenians did not suffer from normal diseases; no other serious disease occurred apart from the usual ones (κατ' ἐκεῖνον τὸν χρόνον οὐδὲν τῶν εἰωθότων). But even if they appeared, all resulted in the same thing: people were eventually dying from the epidemic. Presumably those who had underlying (chronic) diseases were more vulnerable to the epidemic. Apart from this group of people at risk, Thucydides mentioned the medical staff as being vulnerable because they were the first who contacted those infected (ἀλλ' αὐτοὶ μάλιστα ἔθνησκον ὅσω καὶ μάλιστα προσῆσαν).

However, the difference was not restricted only to symptoms and the epidemiology. Most importantly it affected individual behaviour. I have already mentioned Pericles' change of behaviour and beliefs as cited by Plutarch. Some people were scared. They did not go near an infected person (εἴτε γὰρ μὴ 'θέλοιεν δεδιότες ἀλλήλοις προσίεναι,) who was left abandoned (ἀπώλλυντο ἐρήμοι). Others, on the other hand, had the virtue (οἱ ἀρετῆς) and felt ashamed (αἰσχύνη) to leave their friends to die alone. Worst of all (δεινότατον δὲ παντὸς) was the effect on people's mood (ἀθυμία) once they realized that they were infected. The result was hopelessness (ἀνέλπιστον) which they could not stand (οὐκ ἀντεῖχον).

Thucydides also made an important observation that those who survived, like himself, were not infected a second time and even if they were infected, this was not lethal (δὶς γὰρ τὸν αὐτόν, ὅστε καὶ κτείνειν, οὐκ ἐπελάμβανεν). And these people were so happy that they thought for the time being that they would not die from any other disease. They were immune not to the disease which caused the specific epidemic but to all types of diseases. According to Thucydides, this was an "empty hope" (κούφης ἐλπίδος); an expression that even today is used in Greece to describe vain hopes, which, nevertheless, make someone temporarily happy (παραχρῆμα περιχαρεῖ). Thucydides mentioned that these people were very

compassionate to those who were infected because they knew what they had to go through.

The synchronous pandemic does not reject any of the above observations. Firstly, there is a general idea of the symptoms of COVID-19, as in 430 BCE, but there are also many variations. Some even show no symptoms at all which might have been the case in ancient times. Secondly, as in 430 BCE Athens, in today's world of 2020, people are dying alone either in hospitals (nursing homes) or in their own houses without any help. Thirdly, even those who have the best of health care system (countries and individuals) cannot avoid death. It hits both the rich and the poor; the known and unknown persons. As in ancient Athens, the medical and nursing staff is the most vulnerable social-professional group. The current evidence does not reject this hypothesis even though today the available Personal Protective Equipment (PPE) have been well developed. In antiquity these were non-existent. Fourthly, similarly to ancient Athens no medicine can absolutely cure COVID-19. Today, as in ancient Athens, some medicine seems to work for some people, but it does not work for others. Despite all the progress in pharmaceuticals, epidemics and pandemics outsmart human ingenuity. Fifthly, people with underlying diseases (i.e., suffering from other diseases such as cardiovascular, kidney, diabetes, blood pressure etc.) are finally deceased from the COVID-19. This was the case in ancient Athens as well. Sixthly, one of the consequences of the disease for both those who were infected and those who were not is the feeling of isolation, desperation and depression. In ancient times, Thucydides told us that people were suffering from *ἀθυμία* which can be translated as depression. Seventhly, today we do not really know whether people who are infected cannot be infected again and if they are infected whether they can die from it. Thucydides hands-on evidence did not reject the hypothesis of immunization, i.e., infected but survived people did not die if they happened to get infected a second time.

Finally, a note should be made on the social or physical distancing. The war forced masses of people to move from the countryside behind the Long Walls of Athens where not only adequate houses were unavailable but people were forced to sleep in dirty and crowded huts. The connection of overcrowded places and the spread of the disease was clearly stated in Thucydides' discussion of the epidemic in two different parts. For the first time, Thucydides mentioned this in 2.52.1-2.52.2 ('Επίεσε δ' αὐτοὺς μᾶλλον πρὸς τῷ ὑπάρχοντι πόνῳ καὶ ἡ ξυγκομιδὴ ἐκ τῶν ἀγρῶν ἐς τὸ ἄστυ, καὶ οὐχ ἦσσαν τοὺς ἐπελθόντας. οἰκιῶν γὰρ οὐχ ὑπαρχουσῶν, ἀλλ' ἐν καλύβαις πνιγηραῖς ὥρα ἔτους διαιωμένων ὁ φθόρος ἐγίγνετο οὐδενὶ κόσμῳ).

But this citation by itself does not show any link between the density of population and the spread of the disease because the emphasis is on the inconvenience of stay and the quality of housing. However, later on, in 2.54.5, Thucydides explicitly made the connection between the spread of the disease and the overcrowded Athens during this period. He wrote that in Athens and in other places with high population density (τὰ πολυανθρωπώτατα) the disease was more lethal.

Thucydides never suggested the idea of social or physical distance as a cure to the spread of the epidemic. Today humanity learned that distancing might be a good antidote to the spread and therefore the lethality of the disease. At last we found something that future generations learned from past mistakes.

An Epidemic Gives Rise to Metaphysical Explanations

The ancient epidemic could not be explained by scientific methods. The medical profession of the time could find neither the cause nor the cure¹⁴. Also, epidemiologists today and then could not find the source either. In such situations of ignorance, metaphysical explanations find fertile land to grow. Thucydides gave us two such explanations.

The first metaphysical explanation is based on an elegant story based on the spelling of two Greek words which phonetically sound the same: λιμός (famine) and λοιμός (plague). Thucydides wrote that older Athenians remembered an old saying which stated that “a Dorian war will come along with a plague” (ἤξει Δωριακὸς πόλεμος καὶ λοιμὸς ἅμ' αὐτῷ). However, he pointed out that the old saying was talking about λιμός (famine) and not about λοιμός (plague). Since this was a verse of a presumably larger piece of a poem, it went down from generations to generations by the word of mouth (as all epic and didactic poetry or prose). Even though some disapproved of such an interpretation of the word -plague instead of the correct famine-, Thucydides concluded that, for the time being (ἐπὶ τοῦ παρόντος), the interpretation of the plague won (ἐνίκησε) over famine and the word plague was used (ἐνίκησε δὲ ἐπὶ τοῦ παρόντος εἰκότως λοιμὸν εἰρησθαι). Immediately, though, he pointed out that if another Dorian War happened and was associated with a famine, then people will interpret the old saying differently. Why? Thucydides generalized his observation and said that it is in people’s nature to adjust their memory to what they suffer from “...οἱ γὰρ ἄνθρωποι πρὸς ἃ ἔπασχον τὴν μνήμην ἐποιοῦντο”. And in 430 BCE they suffered (ἔπασχον) from the plague.

The second explanation had to do with the God Apollon. It is well known from Homer and in the Trojan War that Gods had taken sides with one or another army; with one or another protagonist (hero) of the war. Athenians remembered a prophesy given by the Oracle of Delphi which was a Temple of Apollon. Pythia told Lacedemonians that they would win the war if they fought with all their power (εἰ χρηὴ πολεμεῖν ἀνεῖλε κατὰ κράτος πολεμοῦσι νίκην ἔσεσθαι). In such a case, Apollo would help them (καὶ αὐτὸς ἔφη ξυλλήψεσθαι).

Thucydides wrote that Athenians believed that the epidemic was sent by Apollo to help the Lacedemonians because the pestilence started right after the Peloponnesian War. Of course, if Athenians won the war, the Pythia could always

¹⁴It is interesting to note that one of the participants in Plato’s Symposium was physician - Eryximachus. His theory on what causes the epidemics (λοιμοί) is related to unjustified cosmic Eros (i.e., sexual encounters) and this is what brings the epidemics and other illnesses (οἱ τε γὰρ λοιμοὶ φιλοῦσι γίνεσθαι ἐκ τῶν τοιούτων καὶ ἄλλ’ αὖ ὅμοια πολλὰ νοσήματα καὶ τοῖς θηρίοις καὶ τοῖς φυτοῖς).

argue that Lacedomonians did not fight with the required zeal (κατὰ κράτος πολέμοῦσι) as the oracle demanded. This was surmised by the Oracle. The Oracle (Gods) never makes mistaken prophesies. People interpret it the wrong way.

Related to this is a story told by Plutarch. In his work on Pericles, he wrote that Theophrastus used as an example (a case study) in his work on *Ethics* Pericles change of attitude when he was infected by the disease. Pericles, throughout his life and under the influence of his teacher Anaxagoras, had adopted an orthological approach in explaining natural phenomena. However, according to Plutarch, in his last years of life and under the influence of some women had an amulet in his neck to protect him from the disease. The way Plutarch mentioned that Pericles himself was showing this to his friends to demonstrate how personal sufferings can make someone believe in such a stupidity. This indicates to me that Pericles was not superstitious but was wearing the amulet to please his surroundings. I have seen this in modern Greece many times. People's logical reaction when asked about it, they say it does not hurt to wear it. Why does someone wear a decorated and colourful wrist watch and not a very simple one? I consider it a stoic approach to life.

I found another story reported by Dan (2008) citing Weber (1921) but the original source is Lucian of Samosata, the satirical author of the 2nd century C.E. He records the following legend (vol. 2, p. 103):

At the time of the great plague, the wife of Architeles the Areopagite had a vision: the Scythian Toxaris stood over her and commanded her to tell the Athenians that the plague would cease if they would sprinkle their back-streets with wine. The Athenians attended to his instructions, and after several sprinklings had been performed, the plague troubled them no more; whether it was that the perfume of the wine neutralized certain noxious vapours, or that the hero, being a medical hero, had some other motive for his advice. However that may be, he continues to this day to draw a fee for his professional services, in the shape of a white horse, which is sacrificed on his tomb. This tomb was pointed out by Dimaenete as the place from which he issued with his instructions about the wine; and beneath it Toxaris was found buried, his identity being established not merely by the inscription, of which only a part remained legible, but also by the figure engraved on the monument, which was that of a Scythian, with a bow, ready strung, in his left hand, and in the right what appeared to be a book. You may still make out more than half the figure, with the bow and book complete: but the upper portion of the stone, including the face, has suffered from the ravages of time. It is situated not far from the Dipylus, on your left as you leave the Dipylus for the Academy. The mound is of no great size, and the pillar lies prostrate: yet it never lacks a garland, and there are statements to the effect that fever-patients have been known to be cured by the hero; which indeed is not surprising, considering that he once healed an entire city.

Apparently, Athenians practiced this -which most probably worked as a kind of disinfection still used today, e.g., chlorine. Because of this apparent success Athenians treated him as the physician-hero who saved many lives and every year they honored his memory.

In the synchronous pandemic of 2020, metaphysical explanations do not seem to be the norm. However, since the outset of Covid-19, Iran has sent the message

that this disease was sent by God to punish the western civilization. But God punished Iranians as well. God did not exclude them from the pandemic. Apparently the sin and the infidelity is independent of nationality and ethnicity.

In the USA metaphysical explanations thrive in all its religions. The argument of the nature of God -good or bad-, has reappeared. From my reading of all the fiction and non-fiction literature of pandemics, I never encountered even one exemption to this rule. Diseases are sent by the mighty God. Any religion's God.

At least in ancient Greece there was a hope that a feud between Gods -Appollo versus Athena and Poseidon- might save the non-mighty and mortal human beings. In the synchronous monotheist religions such a hope has vanished. It is not a progress but a regression. The Greek Orthodox Church partially allows for more than one God and of course its many Saints who can act independently. I have not seen any source which argues that the Gods or Saints of the Greek Orthodox Church had different opinions about the destiny of a specific human being. If you are protected even by one Saint of the Greek Orthodox Church then even God cannot intervene to change this good fortune. You see that in modern Greece. People who are saved from the Covid-19 say that God saved them or the Holy Mother saved them or a specific saint saved them. This plurality shows that Greeks never lost their memory of the Gods of Ancient Greece, with the sole exception I have already mentioned: nowadays Gods and saints do not fight between themselves, which I take as a regression. If one is protected by one, there is no right for others to intervene, and this includes the mighty God.

On the other hand, there is a number of writings that predicted an epidemic or pandemic but these were based on the statistical occurrence of such phenomena rather than considered God's Action. However, even in ancient times, Thucydides mentioned that these metaphysical explanations were abandoned at the end.

What priests and oracles had prophesized was entirely useless and in the end they distanced themselves because the disease has defeated them (ὅσα τε πρὸς ἱεροῖς ἰκέτευσαν ἢ μαντείοις καὶ τοῖς τοιούτοις ἐχρήσαντο, πάντα ἀνωφελεῖ ἦν, τελευτῶντές τε αὐτῶν ἀπέστησαν ὑπὸ τοῦ κακοῦ νικώμενοι).

I am not sure that this claim by Thucydides had a universal application. I cannot conceptualize how someone may have lost his faith to God when he trusts that these diseases along with many other ordeals are sent by God to test people's confidence in him. This circular logic is at its best when is applied to people who believe in metaphysical explanations.

An Epidemic Has Social and Political Consequences

Thucydides in 2.52-2.53 described Athenians' social reactions to the epidemic. I have already discussed individual reactions to the disease. Thucydides separated them from social impacts (including anthropological, economic, ethical and psychological) and political (including military) effects. Since then, humanity has learned that epidemics and wars change social and political attitudes. The ancient Athenian plague was not an exception. Epidemic and war co-existed.

One of the effects of the war, which I have already mentioned, was that Athenians were forced to move behind the Long Walls. This was a strategic military decision suggested by Pericles. From this political decision a number of social problems emerged. Overcrowded Athenians encountered difficulties in finding a place to stay. Space was extremely limited. They used even sacred monuments which was an early indication of violating social norms.

Once the epidemic struck, because of the seclusion of population in a small area, the infection spread immediately and people were dying like sheep. People were dying everywhere and without any help. One could see corpses everywhere. Thucydides observed that because of the high spread of the epidemic, people became indifferent to sacred places. Before no one was allowed to die inside a temple but now, because of the force of the epidemic, this custom was violated. However, even the social custom of burying changed dramatically without any respect for the way people were cremated and buried.

The social effect of the epidemic included the violation of law as well. Those who argued in favor of virtue (the good) had an increasing difficulty in persuading others as the epidemic persisted. They counter-argued that the disease did not discriminate between good (ethical, virtues) and bad (sinful, non-virtuous) people; between rich and poor; between loyal and non-loyal to the laws of the *politeia*. Thus, people lived for the moment and tried to enjoy their lives engaging in self-indulgences throughout whatever time they thought was left for them. When a rich person died, his property was stolen. Divine or man-made laws could not prevent such antisocial behaviour. Thucydides gave a logical justification or explanation (εἰκὸς εἶναι) of such behaviour arguing that people were not following the law because by the time they would have to face a court they might not be alive. What would be a greater punishment than the epidemic itself which was equivalent to a death penalty which, if inflicted could occur in less than ten days according to Thucydides' account. So, before the epidemic struck them (πρὶν ἐμπεσεῖν), it is logical to enjoy one's life (τοῦ βίου τι ἀπολαῦσαι). This reveals once again the orthological approach of Thucydides analysis of history.

The social upheaval created by the epidemic has a direct effect on the political process; especially when this co-exists with a war. Some Athenians blamed the whole situation on Pericles because he was the one who insisted going into war with Sparta. Thucydides links the two in 2.57. While the Peloponnesians were outside the Athenian Long Walls, the navy of Athens was active but the epidemic struck both the city of Athens and the army (ἡ νόσος ἐν τε τῇ στρατιᾷ τοῦς Ἀθηναίους ἔφθειρε καὶ ἐν τῇ πόλει). For example, the expedition in Poteidia was not successful and the Athenian army of 4,000 soldiers lost 1,500 to the disease. At the same time, those *douloi* who escaped the city were informing the Peloponnesians what went on inside the city due to the epidemic; the latter information scared away the Peloponnesian who left Attica earlier than planned.

Thus, Athenians had to face the epidemic inside the city, the besieging Peloponnesians (destroying their fertile land and private houses) and the *doulous* who were escaping Athens. The political situation could not have been worse. The war started with the worse terms for Athenians. Some of them blamed all their misfortunes to the war and the war on Pericles. Thus, they thought that it would

have been a good idea if they could come to terms and sign a peace treaty with the Spartans¹⁵. Thucydides before citing Pericles' response to all these accusations made an excellent introduction-summary of the situation which existed in Athens just after the epidemic (2.59).

Μετὰ δὲ τὴν δευτέραν ἐσβολὴν τῶν Πελοποννησίων οἱ Ἀθηναῖοι, ὡς ἢ τε γῆ αὐτῶν ἐτέμνητο τὸ δεύτερον καὶ ἡ νόσος ἐπέκειτο ἅμα καὶ ὁ πόλεμος, ἠλλοίωοντο τὰς γνώμας, καὶ τὸν μὲν Περικλέα ἐν αἰτία εἶχον ὡς πείσαντα σφᾶς πολεμεῖν καὶ δι' ἐκείνον ταῖς ξυμφοραῖς περιπεπτωκότες, πρὸς δὲ τοὺς Λακεδαιμονίους ὄρμηγτο ξυγχορεῖν· καὶ πρέσβεις τινὰς πέμψαντες ὡς αὐτοὺς ἄπρακτοι ἐγένοντο. πανταχόθεν τε τῇ γνώμῃ ἄποροι καθεστηκότες ἐνέκειντο τῷ Περικλεῖ.

After the second invasion of the Peloponnesians in Athens, where they destroyed for the second time their land and the epidemic and the war were pressing, opinions about Pericles were changing and the reason was that he persuaded them to fight and because of him they were suffering and they were ready to compromise with the Lacedemonians. And they send representatives but nothing happened. In a such general deadlock they were against Pericles.

Pericles saw all these and with his usual determination and rhetorical skills gave Athenians courage and hope. Once again, Thucydides saved for the future generations another speech by Pericles in front of the *Ecclesia of Demos*. Pericles told the Athenian public that he was expecting such behaviour against him because he recognized that people were suffering from both the epidemic and the war. The purpose of his speech was to persuade Athenians that they did not treat him fairly. From what Thucydides has told us, Pericles was able to persuade Athenians to continue the war and he was able to be reelected as a leader. Unfortunately for him, his sister, his two boys and many of his friends and advisors could not survive the disease. The leaders who followed Pericles and led Athens did not meet the basic standards which their epoch and the situation of the war demanded. Nevertheless, Athens was able to counterbalance the Peloponnesian force and by 421 BCE they signed yet another peace agreement. Five years later the expedition to Sicily - contrary to Pericles's warnings in the beginning of the war-, brought Athens to its knees.

Pericles' speech was a long one and made many noticeable observations which Thucydides presumably thought that future generations may benefit from. Pericles made clear from the beginning that a politeia can survive only if its citizens are united. This is not good only for the politeia but for each one individually. Secondly, the decision to go to war was a common decision and it is unfair now to

¹⁵ Aristophanes' masterpiece *Acharnians* performed in 425 BCE-, reflected this idea of a peace treaty with Sparta but the Athenian Demos was against it. This comedy was staged two years after the epidemic had disappeared and therefore could not play a role in changing the opinion of the majority of Athenians who wanted war. This is another indication that the war occurred not because of Pericles but because the majority of Athenians wanted it. The protagonist of the comedy, Dicaeopolis, owner of an agricultural property in the area of Acharnais is forced to stay behind the Long Walls leaving his land uncultivated. According to the play, he signed a private peace treaty with Sparta so that he could work on his land and enjoy all the fruits of peace.

blame it on Pericles alone. He built his argument saying that the reason Athenians changed their mind was the epidemic.

This points to the casual relations between the epidemic and the political and military developments. Pericles acknowledge Athenians were facing many problems such as the catastrophe of their property but most important one was the epidemic (ὁ ὑμῖν πρὸς τοῖς ἄλλοις οὐχ ἥκιστα καὶ κατὰ τὴν νόσον γεγένηται).

He recommended that Athenians set their personal grieving and sufferings aside and concentrate on the issue of common salvation (ἀπαλήσαντας δὲ τὰ ἴδια τοῦ κοινοῦ τῆς σωτηρίας ἀντιλαμβάνεσθαι). Pericles made a cost-benefit analysis of what Athenians had lost so far (land and property) but keeping their greatest wealth intact, i.e., the navy power of Ancient Athens. Pericles concluded that if luck were to be distributed half and half between themselves and their enemies, then, in addition to hope, the boldness of Athenians would determine the outcome of the war.

Thus, Athenians should not have complained about the results of the war because these are things that one would expect from such a situation. But he did acknowledge that things were aggravated by the unexpected epidemic (ἐπιγεγένηται τε πέρα ὧν προσεδεχόμεθα ἢ νόσος ἦδε, πρᾶγμα μόνον δὴ τῶν πάντων ἐλπίδος κρεῖσσον γεγεννημένον).

The decision by the Athenian Demos was not an easy one. Firstly, they decided to fine Pericles with an amount which is not mentioned by Thucydides. Secondly, they did not re-elect him as *strategos*. However, after one year, they elected him again as their leader because they admitted -as Thucydides mentioned- that he was the one who could lead them in such difficulty times.

Thucydides revealed that Pericles advised Athenians that they would win the war if they did not endeavour in new conquests (as they did years later in Sicily) and if they protected their city. According to Thucydides, Athenians did exactly the opposite. Based on these, Thucydides reached a conclusion which becomes a testable hypothesis: can democracy survive without good leaders? It seems to me that Thucydides' answer is no. This is how I interpret the section 2.65.10. Thucydides said that the political system of Athens was called democracy but in reality, it was one man's rule (ἐγίγνετό τε λόγῳ μὲν δημοκρατία, ἔργῳ δὲ ὑπὸ τοῦ πρώτου ἀνδρὸς ἀρχή).

After two and a half years from the beginning of the war, Pericles died. Despite his early death, Athenians could easily have won the war if they had followed his advice. One may argue that if Pericles had survived the disease, Athenians would have emerged victorious. The epidemic had an impact on the outcome of the war because Athenians lost a great leader just in the beginning of this long Hellenic civil war. In 404 BCE the end of the war found them defeated. It was the beginning of the end for the Athenian Classical (Golden) Age. And nobody can argue that the epidemic played any role¹⁶. By the end of the war, the

¹⁶Thus, I disagree with all those writers who claim that the epidemic had significant (long-run) military, political and social consequences. For an example of such a study see Soupios (2004). The argument of Pericles lost in the epidemic cannot explain the defeat of 404 BCE and the decline of Athens because Pericles would have died one day if nothing else from old age. In 404, if he lived, he would have been 90 years old.

epidemic had been forgotten. Thus, the political and social implications of epidemics and pandemics are destined to be short-run and they last as long as the disease itself last.

It is too early to draw any analogies with the current pandemic. Some early warning signals do support Thucydides hypotheses on social and political effects but only time will show. However, if the effects of the great epidemic of 430 BCE are the rule, then the social and political reactions that we see today with the COVID-19 will be forgotten once the pandemic is over.

Epilogue

Thucydides was right, as human nature does not change. People do not differ not only across countries but across epochs as well. The only difference is in technology as so eloquently described by Hesiod in his *Works and Days* when making a reference to Prometheus.

Thucydides was wrong when he believed that writing his history would prevent future generations of the human race to avoid making the same mistakes again. The multitude of wars that followed the Peloponnesian War including the so many civil wars in Greece and elsewhere do not so far verify Thucydides' thesis. The mistake of a war, if it is a mistake, seems to be unavoidable.

On the other hand, the same applies to individual, social and political reactions to epidemics. Apart from some small differences, people and societies respond to epidemics and pandemics today in the same or in similar way as did the Ancient Athenians in 430 BCE. And while one might rightly think that a tremendous progress has been made in medical and pharmaceutical technology, the most fundamental problems remain the same when one compares the ancient Athenian epidemic with the current ecumenical pandemic. As in the ancient Athens, humanity today does not know the source, the microbial cause and the nature of the disease; it has not found a cure for the disease; the medical staff (doctors and nurses) were and still are today the most vulnerable groups of the society; and people who have underlying chronic history of illnesses have a higher probability of dying from it.

Social and political issues seem to be the same. As in the ancient epidemic so in the synchronous pandemic, some people, even head of states blame it on foreigners. Some go so far as to argue that it is part of a biological war; similarly, to what some Athenians thought about their epidemic. Comparable are the reactions to social norms. Today, as in ancient Athens, people are dying alone and are buried in mass graves. Some citizens blame it on their politicians. Even metaphysical explanations have not disappeared. In the synchronous pandemic, even the metaphysical explanations of God sending the disease to punish the sinful have been adopted by heads of states and religious leaders. It is interesting how similar does the world look today to the one of ancient Athens. The only difference is in technology.

After all these years, it seems only Prometheus has been working hard to change the material conditions. Unfortunately, philosophers and historians have not

worked as hard to change people's non-orthological explanations of ecumenical phenomena.

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The D-Learning Alternative During COVID-19 Crisis: A Preliminary Evaluation Based on Kirkpatrick's Model

Jalal Ismaili & El Houcine Ouazzani Ibrahimi

The COVID-19 pandemic has placed schools around the world under unprecedented challenges where saving students' lives is placed ahead of education as a priority. Within these conditions of distress and uncertainty, education authorities had no choice but to move traditional classes into online ones to ensure the sustainability of studies. The abrupt inevitable decision has been a first for most if not all teachers and students who are invited to cope with a totally new teaching/learning model without necessarily having prior experience in Distance Learning in terms of apparatus or techniques. This study comes as an in-progress appraisal of the D-learning scenarios proposed by Moulay Ismail University (MIU) in Meknes, Morocco, based on a two-level evaluation model (Reaction and Learning) proposed by Daniel Kirkpatrick. It is a real-time evaluation of a learning strategy that has long been considered optional for some students, to become, rather, a plan A constituent for many education departments around the world. The study investigates areas of success and failure from the students' perspective via 4 sub-indicators: accessibility, autonomy, retention and psychological impact. The study concludes that the figures can be more reassuring about the D-learning experience in MIU once issues related to connectivity and communication are redressed.

Keywords: *d-learning, e-learning, pandemic, COVID-19, Kirkpatrick's model, information and communication technology*

Background

Following the Moroccan government's decision of complete lockdown to prevent any uncontrolled spread of COVID-19, the ministry of education took measures to ensure the continuity of studies by, for instance, placing at the disposal of universities access to TV and radio channels to broadcast lectures and courses on multiple topics for different areas of knowledge. By the same token, universities tried to be more autonomous by setting up their own D-learning platforms and social media channels, recording their authentic video podcasts and sharing access to prestigious library databases. As the confinement is going to last longer than expected in many parts of the globe, governments are calling their citizens to cope with the virus and the new mode of living. So far, uncertainty prevails for teachers, students and decision-makers on whether the students will be able to resume their studies at schools as normal as they did before the pandemic.

D-learning will probably continue to serve as a plan B for many schools around the globe, especially those challenged by large size classes where social distancing is highly required. So far, the official bulletins and communications issued by the government (Minister of National Education 2021, MapNews 2021) tend to promote an assuring discourse that has not been empirically verified. Because it is of paramount importance to retrieve feedback from students to

evaluate the effectiveness of the experience and pinpoint areas of imperfection that hinder the attainment of optimal results, this study comes to provide a preliminary concise evaluation of the D-learning model adopted by The MIU affiliate Higher Institute of Technology. The school that hosts students from divergent communities and social milieus (urban communities, suburban towns and remote villages ...) should serve as a typical case study that fully satisfies the criteria of representation and randomness. The institute takes advantage of the university's digital resources and apparatus whose added value is yet to be proven during these peculiar conditions. The evaluation examines the process's *Accessibility* (students' ability to access the resources placed at their disposal to maintain the continuity of studies), *Autonomy* (the students' ability to process/digest the course material provided by the faculty), *Retention* (the student's ability to provide pertinent feedback and perform well during exams) and *Psychological impact* (the student's ability to cope with the conditions that characterise the D-learning model)

The paper is divided into 6 sections and organised as follows: The first section discusses the significance of Information and Communication Technology (ICT) before the pandemic, followed by a review of ICT programs in Morocco. The related work section is dedicated to the state of the art relative to D-learning before and during the pandemic in Morocco. The practical part starts with a briefing about the methodology, and results. Finally, comes the implications and interpretations section and conclusion.

E-Learning and D-Learning in Morocco: GENIE Programme

The ministry of national education in Morocco celebrates the programme of Generalisation of Information and Communication Technologies in Education (GENIE) as the most elaborate collaborative ICT programme in the country. In order to approximate the global ever-evolving research in Information and Communication Technology for Education (ICTE), the Moroccan ministry of education launched the Generalisation of ICT in Education Programme (GENIE) in 2006 to establish a nationwide strategy that systematises the abrupt occasional initiatives by teachers and voluntary associations whose effectiveness remained, for a while, questionable and more intuitive.

In its initial version, GENIE was granted a period of three years with three principal axes; infrastructure, training and digital resources:

Infrastructure: setting up multimedia environments with internet connection for students in partnership with international hardware and software companies. Each Regional Academy of Education and Training (RAET) places at the disposal of affiliated teachers 2 multimedia rooms for professional training.

Training: It was based on a waterfall approach. At the central unit in Rabat, a group of "Master Trainers" is selected and trained by experts. These Master Trainers will undertake the mission of coaching 4 regional coaches from each of the 16 RAETs. These 4 coaches would, in return, give training to 2 or 3 school staff who should eventually transfer the training to their co-workers.

Digital resources: also called content development aims at providing digital resources and establishing a national laboratory of digital resources and a national ICTE web portal.

GENIE II (2009-2013) was particularly characterised by the introduction of a fourth axis to be added to infrastructure, training and digital resources; that is of usage development. The new mission sets a number of priority objectives such as the acquisition of digital resources, launching an ICTE web portal, organising sensitisation campaigns and sharing workshops. It also investigates and tracks what the end users do with ICT (Ennda 2010). Although the pace of realisation has tangibly improved, the programme fell short again of achieving 100% of the target goals.

Within the Strategic Vision of Reform 2015/2030 launched by the Supreme Council for Education, Training and Scientific Research (SCETSR), particularly in the sixth lever, the council calls for the equipment of educational institutions with the necessary infrastructure, equipment, didactic material... and digital libraries... It also calls for the equipment of classrooms with audio-visual aids and ICTs. The vision has lifted the ban on GENIE and freed it from any fixed-term plans. Starting from 2016, the programme has for the first time opened up on Open-Source programmes thanks to the National Laboratory of Digital Resources (NLDR) and the Morocco-Korean Centre of ICTE Training (MKCT) by means of several projects.

Programme Evaluation: Donald Kirkpatrick's Four Levels of Evaluation

In 1959, Donald Kirkpatrick proposed 4 basic levels of evaluation published in the Training and Development Journal to make up a reference mark for most, if not all, subsequent models of evaluation (Kirkpatrick 2009). When launched for the first time, it made part of a project on evaluating a supervisory training programme, yet the model's simplicity, effectiveness and comprehensiveness required in any evaluation process makes it a good fit for a wide range of study fields including medicine, higher education, vocational education in enterprises, blended learning, ICT, etc. (Moldovan 2016, Tamkin et al. 2002). Because of the ever-evolving research on evaluation, Kirkpatrick had to consistently adapt or update the levels' guidelines, while the four levels (reaction/learning/behaviour/evaluation) remained unchangeable. The levels are also referred to as steps or even taxonomy as each one leads to a more elaborate level that is "more difficult and time-consuming, but ... also provides more valuable information" (Kirkpatrick and Kirkpatrick 2006).

1. Reaction: Kirkpatrick also calls it a "measure of customer satisfaction" (Kirkpatrick 1996). A customer according to him is anyone who takes part of the training course whether they paid for it or not, whether it was voluntary or forced by an organisation. Although the model was conceived about 60 years ago, Kirkpatrick adopts a bottom-up approach to the evaluation process as he believes that the positive reactions of trainees are important for trainers and for those who make public programs.

2. **Learning:** This step measures the effectiveness of learning process and the impact it made on the learners at one of these levels: knowledge, skills or attitudes. Certain programs target enhancing one of these competencies such as languages or engineering, while others can incorporate integrative approaches to enhance two or even three such as motivation and communication courses. The evaluator, therefore, must determine clearly their objectives to remain on a safe side.
3. **Behaviour:** This step is referred to as transfer of training. It examines whether the training has impacted the learner's behaviour at work or school as intended by the institution after attending a particular training. Kirkpatrick, as stated earlier in this chapter, draws attention to the fact that institutions that carry out evaluation are likely to skip behaviour and results evaluation; nevertheless, some institutes bypass the first two levels to address particularly behaviour evaluation from the very beginning. He disapprovingly does not recommend the procedure and even calls it a "serious mistake" because a programme's failure to deliver at the level of behaviour does not impulsively mean that it failed to deliver at the level of reaction and learning.
4. **Results:** This step examines the final results and the effects of the training on learners and institution as well. Optimal results should, for instance, reveal an increase of profit, better quality products, better graduation rates, cost reduction, reinforcement of desirable practices and values, lower drop-out rates, etc. "It is important to recognise that results like these are the reason for having some training programmes. Therefore, the final objectives of the training programme need to be stated in these terms" (Kirkpatrick 2009).

Related Work

Academic research on D-learning during the COVID-19 pandemic is still in progress in many parts of the world. It will certainly take time to conduct a thorough appraisal of this unprecedented experience. Meanwhile, a number of research papers have tried to share perspectives from different parts of the world

In a study entitled "Influence of COVID-19 confinement on students' performance in higher education" Gonzalez et al. (2020) analyse the effects of COVID-19 confinement on the autonomous learning performance of students in higher education at Universidad Autónoma de Madrid (Spain). They compare the differences in assessments before and during the pandemic by dividing students into two groups; a control group from previous years and an experimental group that was interrupted because of the confinement. According to the study, there is a significant positive effect of the COVID-19 confinement on the students' performance.

In a paper entitled "Global impact of COVID-19 on education systems: the emergency remote teaching at Sultan Qaboos University", Osman (2020) highlights the impact of COVID-19 pandemic on the education system in the Sultanate of Oman. The paper provides an analytical description of the Emergency Remote

Teaching Plan in higher education and how the experience has changed the teaching and learning landscape.

In a paper entitled “Innovations in teacher education at the time of COVID-19: an Australian perspective” Scull et al. (2020) address the Australian response to the emerging COVID-19 challenges to the education sector and details how the Australian university implemented a number of innovative solutions to move online. The conversion incorporates synchronous and asynchronous learning opportunities. The paper tries to investigate the factors that contributed to fostering high levels of interaction of pre-service teachers, particularly by means of interviews with professors. Scull et al. provide a number of cues and key lessons that “might benefit others looking for ways to provide high-quality teacher education programmes during and after the COVID-19 pandemic.”

As for the Moroccan context, Oubibi and Wei (2017) argue that e-learning and Massive Open Online Courses (MOOCs), as popular forms of D-learning, are becoming an option no more; they rather represent an imminent conversion towards the undisputed digitalised future of the university. According to them, universities are facing substantial financial and technical imperatives that make e-learning, via blended learning model and (MOOCs), a tempting solution for the university and for the students in China and Morocco. The study also highlights the disparity of readiness for change between Morocco and China in favour of the latter due to investments in ICT placed at the disposal of Chinese universities, teachers and students. In an effort to contribute to promoting D-Learning in Moroccan universities, Riyami et al. (2016) propose a pedagogical plan using MOOC for teacher training. It is a chart of international MOOCs available for university professors which identifies trainings customised to the beneficiaries’ areas of expertise and levels. The study also proposes a management plan to motivate teachers during the training.

Bouziane (2019) conducted an exhaustive synthetic survey of master and doctoral theses in which he investigated success and failure experiences relative to ICT in education in Morocco. The study affirms that online learning, in particular, is not given the attention it is worth by decision makers, which proved to be indeed a strategic pitfall during the Corona pandemic. Bouziane checked the level of Morocco’s e-readiness to integrate into the information society based on a Harvard e-readiness assessment framework (Bouziane, 2019). He concluded that, apart from networked economy, the other indicators of network access, networked society and network policy scored a satisfactory level of preparedness. Whereas indicators and sub-indicators of relevance to the Moroccan university scored lower than average. In another study conducted by Elaasri and Bouziane (2019), they evaluate seven online courses in a digital working space of Hassan II university using Quality Matters rubrics. They concluded that the courses fell short of delivering satisfactory results as far as the quality standards are concerned

The World Economic Forum (2020) showcased the surge of demand for D-learning technologies, particularly online learning platforms after the schools’ shutdown marking the largest “online movement” in the history of education. According to the WEF, the challenges of limited staff training, insufficient bandwidth and little preparation may lead to poor user experience that is

“unconducive to sustained growth”. Yet there is a good chance that a new hybrid model of education will develop with significant benefits (World Economic Forum 2020). The challenges of accessibility to hardware and internet that exist between privileged and underprivileged communities (sometimes within the same nation) are hard to deny or overlook; still, studies have shown that the students’ retention capacity jumps higher (25-60%) while taking online courses compared to classroom courses, according to the WEF. The datum might be justified by the fact that D-learning provides larger margins of autonomy and better customised learning pace (Andresen et al. 2002). These pedagogical and economic benefits, according to the WEF, imply that this new education model will be adopted for good and are not temporary.

To sum up, the review of D-learning literature suggests that the 2019 pandemic is but a trigger that released the process of inevitable radical change. It was just a matter of time before we witness a revolutionary change towards a more digitised model of education. Some countries have foreseen the inevitable need to invest in infrastructure, hence they acted and planned on a long run basis; others did not act until change has become urgent and forcible.

Methodology

The appraisal of distant learning in Morocco, at this point, imposed by the COVID-19 pandemic is important but may not yield a comprehensive ultimate verdict about the whole teaching model. The relevance resides in the fact that it pinpoints areas of weakness to rectify and areas of strength to capitalise on. The authors, thus, prefer to restrict the evaluation to Kirkpatrick’s (2009) first two levels; reaction and learning. The reaction level takes into account the abundance of sufficient material, adequate learning environment, the students’ interaction with peers and instructors and the students’ impression about the experience. Positive feedback at this level does not necessarily mean that the learning process has been effective and successful. The next level (learning) gauges the students’ performance and intake. The attainment of the objectives set forth by the teacher is detrimental to the potential sustainability of D-learning model post the pandemic.

Population of the Study

The population of the study consists of 136 first-year students from the Higher Institute of Technology. The students, whose majors are Business and Computer Science, descend from different parts of the country and divergent social milieus. They were surveyed by means of Google Forms during the first two weeks of May 2020 (7 weeks post the beginning of school shutdown). The survey observed the requirements of anonymity, randomness, representation and disclosure of the survey purpose. The authors notice that the answers were flowing at a high speed compared to other surveys conducted earlier for other purposes (Ismaili and Ouazzani Ibrahimi 2017). Over 85% of valid responses were generated in less than

4 hours, which may be explained by the students' alertness to updates and possession of gadgets to communicate with their school.

Rubrics of Survey

The survey incorporates 4 rubrics. Accessibility, Autonomy and Psychological impact would answer inquiries related to Kirkpatrick's level of Reaction, while the Retention rubric would provide answers relative to the next level that is Learning. Each rubric incorporates 5 items to answer.

- Accessibility: The rubric surveys the students' possession of ICT devices, access to the university's D-learning platform and frequency of use.
- Autonomy: The rubric surveys the students' ability to sustain self-regulated activities without direct interference from teachers.
- Psychological impact: the rubric examines the acceptance of the D-learning model as a constant component of future syllabi, in addition to its role in relieving levels of stress and tension.
- Retention: The rubric surveys the students' capability to retain information they receive online and their confidence in reproducing the inputs.

Data Analysis

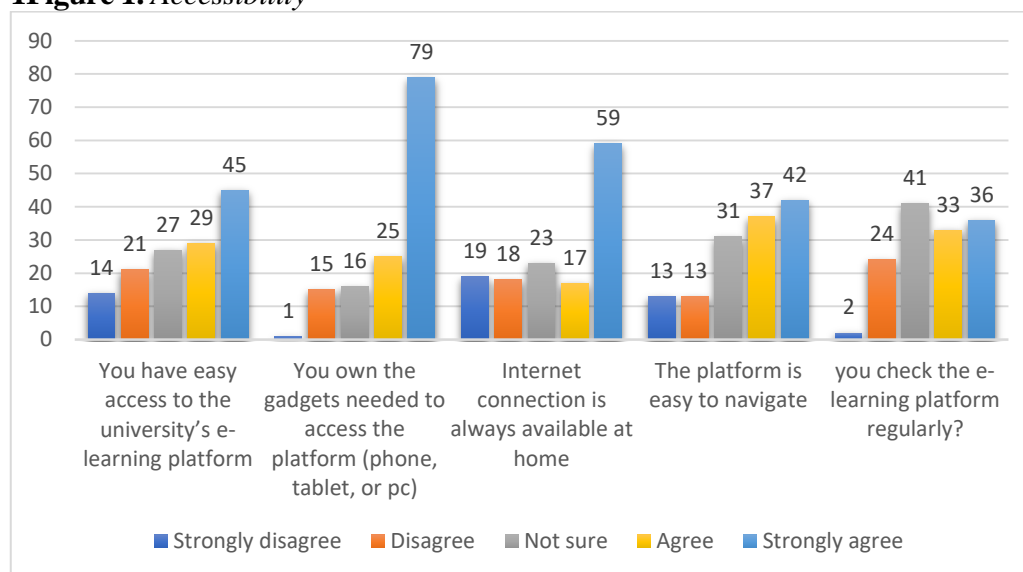
The process of data analysis is based on quantitative and qualitative methodology and is carried out using IBM's Statistical Package for the Social Sciences V21. The analysis investigates areas of correlation between 20 variables; 19 of which are ordinal while 1 is nominal to help better explain the achieved results. Correlation of these variables would eventually lead to building connection(s) between the 4 rubrics of research and understand their mechanisms of interaction. The process will also help draft implications and recommendations for interested stakeholders. The 19 questionnaire items are to be answered on a scale from 1 to 5; 1 stands for highly disagree, while 5 translates into highly agree. The results are considered positive/satisfactory when the scale average is at least 4/5, and it is negative/unsatisfactory when it goes below 2/5. The analysis of each rubric is summed up with an index reference set at 3 based on the Mean. Failure to achieve that number implies that immediate action by stakeholders is required to mend the gap.

Results

Accessibility

This rubric examines the abundance of the fundamental requirements to make the D-learning possible to take place. The items below (see Figure 1) depict the availability of gadgets, internet, engagement, and easiness of platform use.

1Figure 1. Accessibility



According to the survey (Figure 1), 54.5% of the sample students find accessibility to the university’s D-learning platform (FAD) very easy while 25.7% find it a bit challenging. The observed affinity with figures related accessibility to internet access may correlate as 55.9% of students do have access to internet while 27.2% do not. Despite the fact that Moroccan internet operators have engaged in providing free access to the ministry of education’s platforms “except YouTube”¹, the procedure remains of limited impact for higher institutes given that a big number of lectures are uploaded in video format on YouTube. By the same token, 51% of students may be described as regular visitors to the platform, 30% frequent visitors, while 19% are irregular users. The most satisfying results in this rubric are those related to ownership of smart gadgets given that 76.5% of students constantly possess a laptop, a smartphone or a tablet, while only 11.7% do not. The 11.8% who answered “not sure” may have to use a shared device at home.

1Table 1. Accessibility Index Reference Based on Mean

	Easy access to the platform	Ownership of gadgets	Internet availability	Easy to navigate platform	Regularity of visits
Mean	3.5147	4.2206	3.5809	3.6029	3.5662
N	136	136	136	136	136
Std. Deviation	1.36075	1.07972	1.49347	1.27819	1.10690

As the five items have scored higher than the index reference 3, and given that the average mean is 3.69, it is concluded that the accessibility results are satisfactory and indicate the abundance of decent conditions for D-learning to operate (Table 1).

¹<https://www.morocoworldnews.com/2020/03/297143/moroccos-telecommunication-operators-offer-free-internet-access-to-education-websites/>.

Autonomy

Autonomy rubric examines the participants' ability to sustain self-regulated activities, and how well they can do relying on their prerequisite skills and competencies. In the absence of peers and teachers "physically" around, it is important to know how the students handle learning challenges of obscurity, lack of understanding and lagging behind their peers.

Figure 2. Autonomy

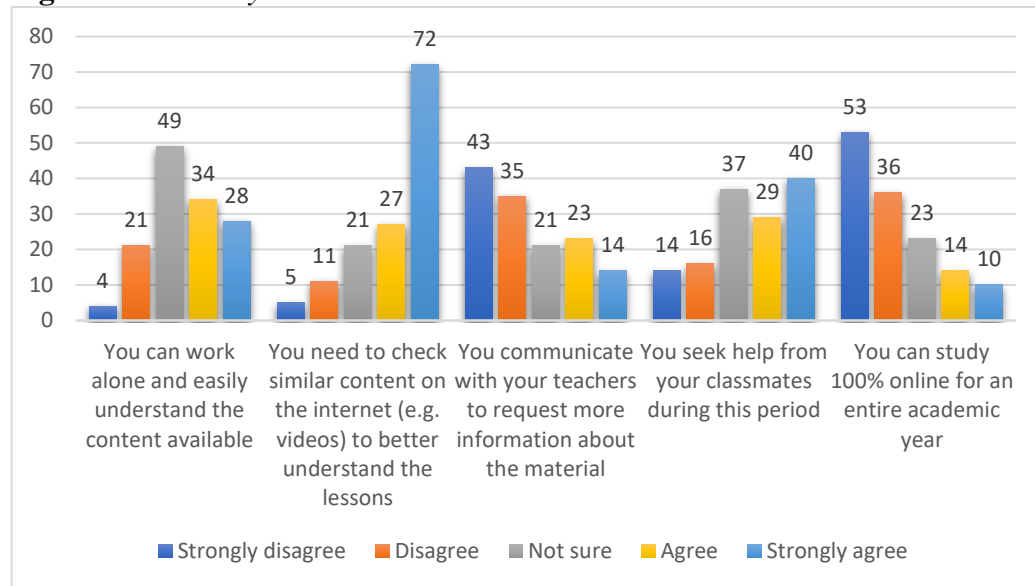


Figure 2 indicates that 45.6% of students can deal with the resources available online in full autonomy, while 18.3% encounter some challenges. 36.1% say they are not sure, and it is completely understandable since average students in the classroom need a bit of help before they can grasp the lessons and digest the difficulties. The study finds that the students deploy their intuitive autolearning mechanisms as 72.8% diversify their resources by consulting similar content on the internet. Networking with peers is another mechanism used as 50.7% of students feel the need to stay connected with their classmates to seek help, coordinate and share material. 22.1%, however, do not feel like they need to. One striking finding about autonomy rubric is the modest level of direct communication with professors. It is true that the university, mainly the faculty, invested a huge effort setting up a D-learning strategy and compiling material in a short time², yet direct communication between students and teachers would result in a more significant outcome. The last question examines the participants' readiness to go 100% online for the upcoming year, and the idea is not welcomed by 65.5% of participants. The reactions suggest that the participants are not ready to trade the

²<http://www.mapexpress.ma/actualite/societe-et-regions/covid-19-cinq-questions-au-president-luniversite-moulay-ismail-meknes/>.

traditional classroom for a virtual one, at least for the time being. Only 17.7% do not mind the transition.

Table 2. *Autonomy Index Reference Based on Mean*

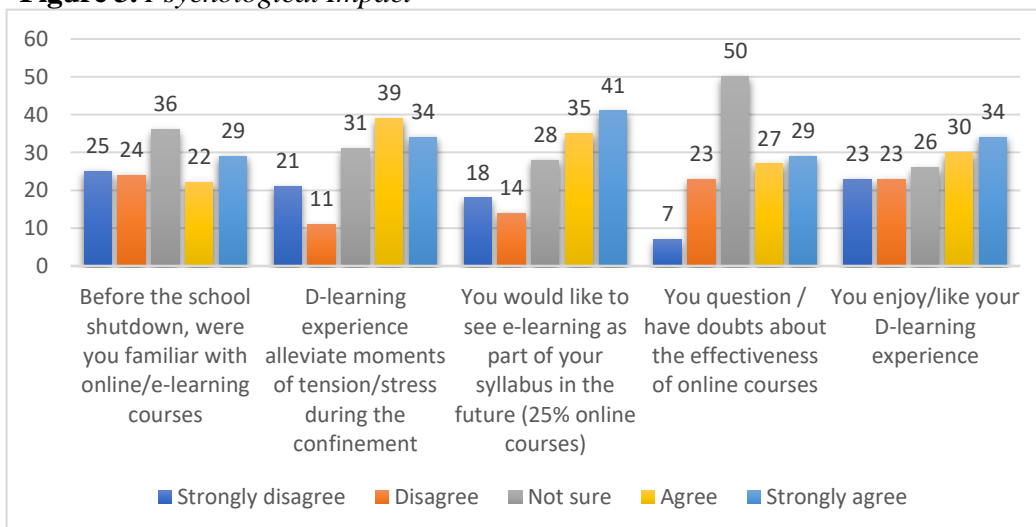
	Full autonomy	Checking other sources	Communicating with professors	Communicating with classmates	Going 100% online next year
Mean	3.4485	4.1029	2.4853	3.4779	2.2059
N	136	136	136	136	136
Std. Deviation	1.07373	1.15649	1.36075	1.30507	1.26560

The index reference has been attained in 3 items and has not in 2 others (Table 2). Still, the average mean of the 5 variables is 3.13, which is satisfactory. The available content as well as the deployment of their autolearning strategies have scored satisfactory results, while direct communication with faculty is yet to be addressed by the university. Communication does not only help in the process of learning, but it is also a source of moral reassurance for students. Certainly, shifting to 100% online courses is an ominous proposition the authors do not endorse as it suggests the confinement will stay for a long time. Thus, the low mean recorded is not considered as negative or fit to be regarded as an index reference.

Psychological Impact

The psychological impact examines the students’ emotional reaction to this experience in addition to identifying the affective filter if there is any. It also verifies whether any prior exposure to D-learning before the pandemic has made the full online transfer any easier.

Figure 3. *Psychological Impact*



As Figure 3 illustrates, the first question of this rubric tries to detect whether students have been prepared to work online before the lockdown. Any preceding initiation would alleviate feelings of floundering and getting lost for novice students with nil D-learning experience. 37.5% of participants acknowledge having a previous e-learning experience, while 36% stated that they do not. The 20.5% left of the sample (undecided) suggests that some students have doubts about their technology skills and are not confident to call themselves experienced D-learners. 41.2% of surveyed students doubt the equivalence of D-learning to actual classroom learning, while 22% have high confidence in technology effectiveness. The good news for D-learning advocates is finding that it helps alleviate feelings of stress and tension during the confinement for 53.7% of surveyed students. 23.5% say it does not because they have accessibility issues on the first place, especially with internet as they explain. In addition, 47.1% think the D-learning experience is enjoyable at the personal level, opposite to 33.8% who do not. When asked if they want D-learning to be partially incorporated (25%) in next year's syllabus, almost 56% welcomed the idea. Only 23.5% categorically rejected the proposition as they will have to deal with the current challenges again; mainly those mentioned in the accessibility rubric.

Table 3. *Psychological Impact Index Reference Based on Mean*

	Familiarity with D-learning	D-learning alleviates Stress	Incorporating 25% D-learning Permanently	Enjoyment of the experience
Mean	3.0441	3.3971	3.4926	3.2132
N	136	136	136	136
Std. Deviation	1.39240	1.35690	1.36624	1.42677

Since the item relative to doubts about D-learning is not applicable to index referencing and may not serve as an objective to target, it was omitted from Table 3. The four other items scored satisfactory results ranging between 3.04 and 3.49. The average mean of psychological impact (3.28) is likely to improve once the issues stated above are redressed.

Retention

In this rubric we study the effectiveness and return on investment of the D-learning model. The D-learning experience may be considered a success only when the students manage to acquire or at least internalise knowledge and skills they at home.

Figure 4. Retention

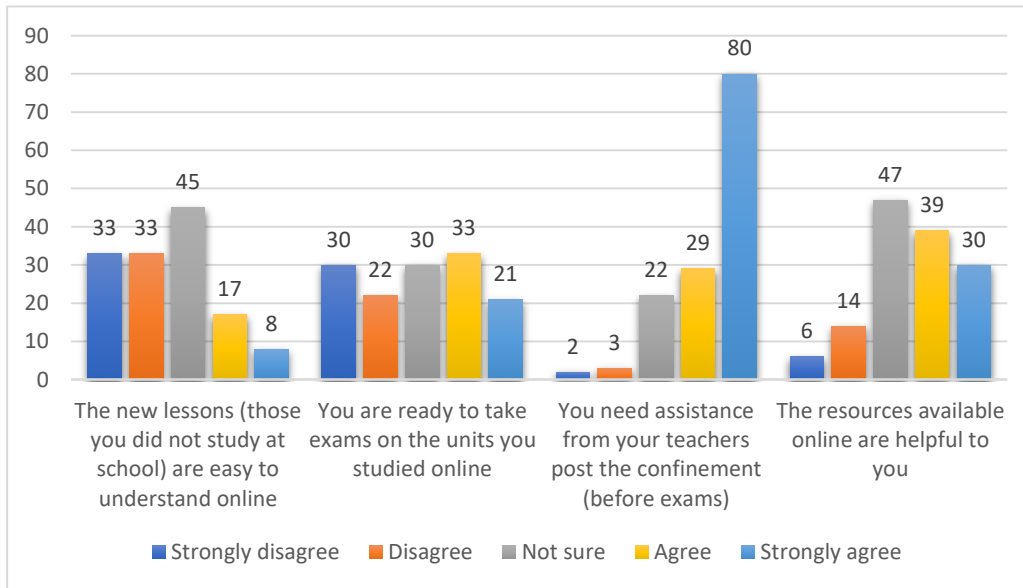


Figure 4 shows that the students encounter challenges with new lessons they are introduced to for the first time that only 18.4% find them within everyone’s reach; 48.6% think they are hard to understand. It is worth mentioning that the students were only two or three weeks away from the end of modules and the remaining lessons make up only a small fraction of the syllabus. These results are consistent with those recorded by the ENSAM (see the related work section). When asked about the helpfulness of content available online, 85.3% left finds it either relatively or completely helpful, whereas only 14.7% think it is not. As for their readiness to take an exam without any review or make-up classes, around 40% said they are ready and 38.3% are not, while 34.6% remained undecided. Nonetheless, the vast majority do not mind the initiative of make-up classes and review before the exams with over 80%. A tiny proportion of 3.7% think they do not need it.

Table 4. Retention Index Reference Based on Mean

	Content is easy	Ready for exam	Assistance before exam is needed	Resources are helpful
Mean	2.5147	2.9485	4.3382	3.5368
N	136	136	136	136
Std. Deviation	1.16100	1.38414	.92872	1.08121

Table 4 above shows that the index reference of success has been achieved in two rubrics. The average mean for the retention rubric is 3.32, which is satisfactory. Students, accordingly, demonstrate their appreciation of the human factor as indispensable to any successful D-learning scenario. The resources placed at the disposal of students by their professors are doubtlessly valued. On the other hand, the weak direct communication with professors apparently affects the students’ retention capabilities and confidence in their competencies. Internalising the

learners' newly acquired knowledge and skills, praising hard work and correcting mistakes reinforce the process of learning and self-efficacy.

Interpretations

Many of the above findings lead us to inspect the potential correlations between variables and subsequently rubrics. Understanding the relations between variables can help interested bodies to find adequate solutions that can elevate the index references. There is still room for the university to adapt and polish the D-learning strategy, but some solutions must be taken at a national level as they involve other parties. It is observed, for instance, that students who do not enjoy the D-learning experience are those who struggle with gadget and internet issues (see Table 5). So, if the ministry in collaboration with other ministries, donors, partners and stakeholders can fix this issue, many other issues would, hopefully, get fixed. Following are observed correlations with the authors' interpretation and personal recommendations

Table 5. Positive Correlations

		Correlations				
		Enjoyment of the experience	Full autonomy	Content is easy	Ownership of gadgets	Ready for exam
Enjoyment of the experience	Pearson Correlation	1	.406**	.497**	.325**	.358**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	136	136	136	136	136
Full autonomy	Pearson Correlation	.406**	1	.384**	.291**	.255**
	Sig. (2-tailed)	.000		.000	.001	.003
	N	136	136	136	136	136
Content is easy	Pearson Correlation	.497**	.384**	1	.316**	.399**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	136	136	136	136	136
Ownership of gadgets	Pearson Correlation	.325**	.291**	.316**	1	.112
	Sig. (2-tailed)	.000	.001	.000		.195
	N	136	136	136	136	136
Ready for exam	Pearson Correlation	.358**	.255**	.399**	.112	1
	Sig. (2-tailed)	.000	.003	.000	.195	
	N	136	136	136	136	136

** . Correlation is significant at the 0.01 level (2-tailed).

Table 6. Negative Correlations

		Correlations	
		Communicating with professors	D-learning alleviates Stress
Communicating with professors	Pearson Correlation	1	-.209*
	Sig. (2-tailed)		.014
	N	136	136
D-learning alleviates Stress	Pearson Correlation	-.209*	1
	Sig. (2-tailed)	.014	
	N	136	136

*. Correlation is significant at the 0.05 level (2-tailed).

1. There is a significant positive correlation between ownership of gadgets and enjoyment of the D-learning experience, $r(134)=0.32, p=0.000$.
2. There is a significant positive correlation between easiness of the content and enjoyment of the experience, $r(134)=0.49, p=0.000$.
3. There is a significant positive correlation between ownership of gadgets and easiness of the content, $r(134)=0.31, p=0.000$.
4. There is a significant positive correlation between the student's feeling of autonomy and enjoyment of the experience, $r(134)=0.40, p=0.000$.
5. There is a significant positive correlation between easiness of content and readiness to take exams, $r(134)=0.39, p=0.000$.
6. There is a significant negative correlation between communication with professors and levels of stress for D-learners, $r(134)=-0.20, p=0.014$.

Discussion

The study of D-learning experience in MIU concludes that 14 out of 19 surveyed items have scored satisfactory results (based on index reference) while 5 require redressing by the university and the ministry. The average mean for the 4 rubrics (accessibility, autonomy, retention and psychological impact) has scored 3.35, which is generally reassuring and subject to positive change post the confinement.

At the level of reaction, the surveyed items may have scored satisfactory levels, yet there is a lot to be done to improve the D-learning experience for students. Because the students did not benefit from any initiative that promotes accessibility to internet and laptop such as Nafida (launched in 2008), they were left to their own financial capacity to provide one. For many years, Nafida provided access to internet and multimedia resources for public schools and subsidised the purchase of laptops and internet connection for students and teachers. This initiative would have made a lot of difference had it been relaunched during the pandemic. The ministry claims that a newly signed agreement with three Moroccan phone and data operators should allow free access to the platforms created by schools and universities, still access to video content (uploaded on YouTube) is restricted and not covered by the pact.

The missing direct communication with some professors has contributed to magnifying the learning challenges for some students (see Table 6). Accessibility to apparatus and internet does not seem to be sufficient for the learning process to be effective. The D-learning model is a new for many professors and most of the students, so when challenges surface the blame is often put on the process as whole that is, then, seen not effective. Exploiting every communication medium, by both parties, helps to draw a much clearer idea about the ends that should be met. The challenges that go mishandled will eventually lead to losing confidence in the utility of D-learning and even in the students' self-efficacy.

As the study reveals a sense of fear by students, or at least aversion, of prolonging studies remotely, there is a good reason to believe that networking with professors and students would lead to maintaining social ties that alleviate tension.

Once online communication with professors and peers is established, approaching learning difficulties would be more positive. The only rubric that did not attain index reference 4, or above, is that of psychological impact. It is perfectly logical to assert that the mounting learning difficulties prevent the enjoyment of D-learning experience. The widely recognised motivation that accompanies the use of ICT for learning (Ismaili 2020) is spoiled by the challenges that accumulate.

Finally, it is repeatedly reported in the survey that the students' household conditions do not help in the process of D-learning. Although the feedback of the sample population does not elaborate on the nature of nuisance they feel, the study recommends adopting a blended/hybrid scenario that reduces the time of physical interaction at school, yet it maintains a minimum of social ties that are essential for the students' psychological health.

Study Limitations

Although the study adopts a mixed method approach, the qualitative dimension remains limited. Direct interviews with the students at the time of lockdown when the disturbances (cognitive and emotional) were reaching their topmost could have drawn a much clearer and real-time image about the students' reactions. Despite the fact that the teachers' perspective is not focal in this study, it is of paramount importance for future related studies to investigate this axis in order to connect the dots and devise effective D-learning solutions.

Conclusions

This study comes to investigate areas of success and failure for the D-learning scenario proposed under the compelling conditions of COVID-19 lockdown. It is a real-time evaluation of a learning strategy that has long been considered complementary and optional for students whose particular professional or personal conditions do not allow attending in-person classes. Probably the lockdown will not last forever, but the D-learning model is being, certainly, reconsidered as a Plan A constituent by many governments and education departments around the world that are now compulsorily invited to examine their ICT assets. Although Kirkpatrick (2009) asserts that the four levels of evaluation (reaction, learning, behaviour, results) may not necessarily be conducted consecutively, doing so is primordial to shaping a better understanding of a programme's effectiveness. The success or failure to deliver is conditioned by the abundance of investment in the infrastructure and learning environment. This study has examined interrelated and interdependent variables of the D-learning experience in MIU at the level of reaction and learning and concluded that:

- The MIU students' satisfaction with the D-learning experience is conditioned by their ownership of decent quality gadgets and internet connection. Failure to help underprivileged students in this regard would leave them

lagging behind their peers. When technology is available, it contributes to making the best of one's autolearning skills (Voogt and Pelgrum 2005).

- Whenever the university's platform content is easily understood, by means of virtual chatrooms for instance, it is noted that the students' motivation to engage in the D-learning experience jumps higher.
- The student's enjoyment of the D-learning experience relies heavily on the student's feeling of autonomy and ability to solve problems on their own.
- The students can get their confidence back only when they have a good command of the syllabus and are permanently guided. Again, stronger and direct contact with teachers can help in the process.
- The more communication with professors, which is below satisfactory in our case, increases, the lower levels of anxiety and stress can get. Communication at this point is not only a scholarly catalyst but also a psychostimulant agent.

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Studying Habits in Higher Education 0 the Outbreak of the COVID-19 Pandemic

Eva Jereb, Janja Jerebic & Marko Urh

The COVID-19 pandemic has caused many changes in all areas, including education. In this paper, we discuss the changes in the studying habits of higher education students brought about by the new modes of education. The research was conducted in Slovenia at the University of Maribor on a sample of 272 students. We investigated whether there had been changes in studying time, studying space, mode of studying and learning during lectures, social elements, and the advantages and barriers of distance learning. We found differences in certain studying habits related to the time and space of studying which are mainly associated with the prohibition of movement and socializing outside the household. We noticed a decline in motivation and its connection with lowering learning goals and students finding it harder to focus on learning. However, we also found that the new mode of studying brings greater flexibility for students, so some want to continue to study in this way.

Keywords: *studying habits, higher education, online education, pandemic, COVID-19*

Introduction

The spread of the COVID-19 pandemic has affected all sectors of society and education in particular (Flores and Gago 2020). Rahiem (2021) says that the transition to working and studying from home, which took place rapidly, caused numerous issues for the education sector, including higher education, with university students dealing with significant obstacles to their learning process. The outbreak of COVID-19 resulted in a digital revolution in the higher education system, with online lectures, teleconferencing, digital open books, online examination and interaction in virtual environments (Strielkowski 2020, cited in Kapasia et al. 2020).

For some students and teachers, this has meant enormous changes in the educational process. Not all of them are used to working online using various platforms and learning management systems, nor are they used to not seeing their peers face to face. Students are confronted with various challenges, some of which could become a real problem. Farooq et al. (2020) identified difficulties such as lack of institutional support, lack of student engagement, difficulties with internet accessibility, issues with online assessments and broader problems with understanding online education dynamics. Kapasia et al. (2020) showed that students face stress, depression, anxiety, poor network connectivity and an unfavourable study environment. Learning at home can be made difficult by siblings and other distractions. Rahiem (2020), cited in Raheim (2021), on the other hand, found out that learning remotely at home allowed students the flexibility to control their own time, which provided them with additional time for self-care and family. Rahiem's (2020) study also explained the technology barriers

and challenges in using ICT. Students face device issues such as incompatible devices and sharing devices with other family members; internet connectivity issues such as unstable connection and limited or non-available internet access; the costs of internet access and new devices; and the skills needed for using new programs and apps.

All these changes, challenges and problems influence the way students learn and their studying habits. In our research, we wanted to determine whether students had changed their studying habits during the COVID-19 pandemic, i.e., whether the pandemic has influenced the way students learn. Are specific changes in studying habits related to inadequate ICT equipment, poor internet connection, less accessibility to teachers, reduced communication with classmates and reduced collaboration with classmates? And has the motivation of students to learn during the pandemic fallen?

Theoretical Background

Studying habits can be described as methods and means of obtaining information (Urh and Jereb 2014). This may take place at the conscious or unconscious level. They help students organize their efforts to solve problems, develop skills, acquire knowledge and complete school obligations (Carter et al. 2011). In the psychology literature, habits are usually defined as behaviours activated automatically by recurring environmental cues and are seen as being typically formed through repetitive behaviour and learned stimulus–response associations (Volpp and Loewenstein 2020). Habit formation is the process by which actions become automatic. We can create habits without intending to acquire them. Or we can cultivate or eliminate them intentionally (Psychology Today 2021). Habits are routines of mostly subconscious regular repetition behaviour (Urh and Jereb 2014, cited in Butler and Hope 1995). Once patterns are developed, people take actions without a conscious decision to do so without the behaviour being proximally motivated by the deliberate pursuit of specific goals (Gardner 2015). Old habits are hard to break and new ones are hard to form. That is because the behavioural patterns we repeat most often are etched into our neural pathways. Habits may persist even when attention or motivation declines. The good news is that it is possible to form new habits (Psychology Today 2021). An important implication is that to change behaviour, one must often undo existing habits by managing exposure to cues and creating new patterns (Wood and R nger 2016).

Good studying habits are vital for improving learning and retention capacity, and they are not difficult to pick up. Undoubtedly, students face many issues in their daily lives which compete for their attention (Ho 2020). As already mentioned, the COVID-19 pandemic raised many additional obstacles students must overcome. What makes it difficult for a student to focus on learning. The issues the pandemic raised will never go away completely. Students need to be proactive and improve their studying habits, which can help them study over a given period of time. They need to realize why studying habits are essential and cultivate them to enhance their knowledge. Finding the right selection and

implementation of studying habits can result in a more effective and efficient mastery of new knowledge that allows students to work more easily and better and improve adaptation both to changes resulting from the pandemic and to more general changes.

According to Loveless (2021), some students can get through school with minimal effort while others cannot. Successful students achieve their success by developing and applying effective studying habits. They schedule the times throughout the week when they are going to study and they stick to their schedule. Students who study occasionally usually do not perform as well as students with a plan and a schedule. Study time should become a part of students' daily routines. Compressing all of the study time into a few long days is not always working and is stressful. Time for studying should be every single day. Consistency and self-discipline are crucial. Developing good study habits will become a routine and help one maintain good performance throughout the study year. When scheduling study hours, students should choose blocks of time when they are at peak performance (Develop good habits 2021). Some people work best in the mornings, others at night.

Taking breaks in between study sessions is very important. Prolonged studying is tiring. One cannot learn effectively when tired or under pressure. Taking breaks will refresh the brain and help absorb new information (Ho 2020). White (2014) states that the 15-to-20-minute window is productivity's "golden hour". From our experience working with higher education students for over 20 years, we can say that studying for one hour and then taking a break helps students learn better.

Grohol (2016) says that many students make the mistake of studying in a place that is not conducive to concentrating. Students should choose an appropriate place to study where there are few distractions. Trying to study in a living room with a TV, a computer with games or even other people can be very difficult or even impossible.

Before we start studying, we need to ensure we have everything we need for work, from notebooks, books, pencils and calculators to drinking water, so we can study without unnecessary interruptions. Taking snack food and drinks to the study location will eliminate trips to the kitchen which break concentration (Chadron State College 2021).

According to Zegarra (2019), it is essential to understand that there are many different learning styles and that each person will retain information better in different ways. Visual learners learn best from pictures, graphs and diagrams. They remember something by visualizing a picture of it in their mind. Auditory learners discover information by listening and interpreting information through pitch, emphasis and speed (Gilakjani 2012). Kinesthetic learners learn through physical activities. They use body, sense of touch and hands to learn. Logical learners need to use reasoning, logic and systems. Verbal learners favour using words and linguistic skills. Social learners like to learn with others or in groups (Zegarra 2019). Solitary or intrapersonal learners prefer learning alone. It is essential to understand one's best learning style for successful learning. Working in groups enables students to get help from others, better and more quickly complete assignments, and teach others (Loveless 2021). Some students prefer to

practise by themselves. They practise by doing old exams and quizzes, depending on the course and availability (Grohol 2016).

Another significant issue is taking good notes. These are beneficial and help to learn and remember important information. It is essential to understand not to take notes of everything, only of what is necessary. When teachers emphasize something, students should write it down (Develop good habits 2021). A note-taking style might also depend on the learning style described above. For example, if someone is more of a visual learner, drawing diagrams in notes will help remember what is essential. But taking notes is not enough: revising them along with other class material is necessary. Successful students revise what they have learned. A well-known revision cycle is to revise shortly after the material was first presented and studied, then again the following week, the following month and six months on. The process of repetition does not have to be very long, and one does not have to repeat everything, only key points and keywords. If you do not revise, you can forget 80% of what you have learned in a few weeks. Frequent revision throughout the course will pay off during exams and ease pre-exam anxiety (Chadron State College 2021).

Loveless (2021) states that simply learning without direction is not effective: students must know what they need to accomplish during each learning session. So before starting, a learning session goal that supports the overall academic goal needs to be set.

Enough quality sleep and food are essential studying habits that most learners do not manage properly – getting a good night's sleep and eating healthily influence the learning process. Students who consume unhealthy food, do not drink enough water and have little quality sleep will find it hard to retain information (Ho 2020). In other words we must bear in mind that healthy living habits have a significant impact on learning abilities.

But there is one other component needed for successful study: taking responsibility for studying. According to Miller (2010), taking responsibility makes a lot possible in our lives. Taking responsibility for education means taking responsibility for homework, academic choices, seeking support if needed, attitude (believing in ourselves, being willing to learn), interactions with others, confidence and growth. If one works hard to learn effectively, the improved skills will soon become a habit and result in higher grades, knowledge, wisdom and confidence.

Method

Sample

The study sample consisted of 272 students from the University of Maribor, Slovenia. Of the 272, 35.8% were male and 64.2% were female; 81.6% were undergraduate and 18.4% postgraduate students; 74.6% were regular and 25.4% part-time students. Social science students accounted for 70.2% of the sample and the natural and technical sciences students for 29.8%.

Questionnaire and Procedure

The questionnaire contained closed questions referring to (i) general data (gender, level of study, mode of study and field of study), (ii) studying habits, and (iii) advantages and barriers of distance learning. The studying habits module was divided into four sub-modules: studying time (7 items), studying space (6 items), mode of studying (26 items) and learning during lectures (5 items). In addition, we included four items related to social elements. All 48 items were measured on a 5-point Likert-type frequency scale. Students were asked to choose from “1=Never”, “2=Rarely”, “3=Sometimes”, “4=Often” and “5=Always” separately for the time before the pandemic and for the period of the pandemic. In addition, students were asked to indicate their average studying time per day.

Advantages and barriers of distance learning during the pandemic were studied using 19 items. Students were asked to indicate the level of agreement on a 5-point Likert-type scale from “1=I do not agree at all” to “5=I agree completely”.

The online questionnaire was presented to students by professors during lectures and tutorials. Participation in this research was voluntary. The study was reviewed and approved by the ethics committee at the Faculty of Organizational Sciences, University of Maribor.

All statistical tests were performed with SPSS. Parametric tests (One – Samples *t*-Test, Paired – Samples *t*-Test, Paired – Samples Proportions Test, and Independent – Samples *t*-Test) were selected for normal and near-normal distributions of the responses.

Results

To determine to what extent and how the COVID-19 pandemic affected students' studying habits, means and standard deviation values for each of the 48 items in (ii) and overall of the sub-modules were calculated and then compared using a one-tailed Paired – Samples *t*-Test. Statistically significant differences were confirmed for *studying space* items and for *learning during lectures* items. Detailed results are given in Tables 1 to 5.

Statistically significant differences in the *studying time* sub-module were revealed for items 3, 4, 5 and 6 (see Table 1). Specifically, the test results showed that students studied on average more often in the morning and at night before the pandemic than during it pandemic, while during the pandemic students studied on average more often in the afternoon and evening than before it.

Statistically significant differences in the *studying space* sub-module were revealed for items 1, 2, 3 and 5 (see Table 2). Due to restrictions on movement and socializing during the pandemic, it is not surprising that students studied more often in the library or with classmates before the pandemic and more often at home, usually in the same room, during the pandemic.

Table 1. Descriptive Statistics for Studying Time Items and Results for t-Test

	Studying time	Before Pandemic		During Pandemic		<i>p</i>	
		Mean	SD	Mean	SD		
1	I prepare a studying schedule (plan for a week or a month).	2.91	1.379	2.98	1.464	0.143	
2	I study all the time.	2.87	1.213	2.97	1.265	0.079	
3	I study in the morning.	2.96	1.256	2.77	1.312	0.000	**
4	I study in the afternoon.	2.91	1.103	3.36	1.196	0.014	*
5	I study in the evening.	2.87	1.328	3.15	1.359	0.036	*
6	I study at night.	2.40	1.458	2.13	1.410	0.015	*
7	I study structured with breaks (e.g., 1 hour of studying, 15 minutes of rest).	3.50	1.272	3.00	1.345	0.191	
	Overall	2.87	0.593	2.91	0.696	0.117	

*: $p < 0.05$; **: $p < 0.01$ **Table 2.** Descriptive Statistics for Studying Space Items and Results for t-Test

	Studying space	Before Pandemic		During Pandemic		<i>p</i>	
		Mean	SD	Mean	SD		
1	I study in a library.	1.54	0.948	1.11	0.491	.000	**
2	I study at home.	4.72	0.539	4.80	0.583	.013	*
3	I study at my classmate's place.	1.68	1.008	1.34	0.814	.000	**
4	The presence of others bothers me.	3.47	1.388	3.50	1.409	.208	
5	I always study in the same room.	3.78	1.143	3.93	1.096	.002	**
6	Before studying, I make sure that there are no disturbances (TV, telephone, etc.).	3.44	1.267	3.40	1.334	.221	
	Overall	3.10	0.527	3.01	0.515	.000	**

*: $p < 0.05$; **: $p < 0.01$

Statistically significant differences in the *mode of studying* sub-module were revealed for items 3, 4, 12, 13, 15, 16, 17, 25 and 26 (see Table 3). Studying in pairs or groups was more common before the pandemic. Monitoring students via video surveillance, especially if there are several students in a group, is very challenging, and there may be several options for using illicit devices like smartwatches, smartphones, magic calculators, live stream wifi glasses and others during exams. As the test results showed, during the pandemic, students used such devices more often than before. During distance education, students received a lot of e-material, which they studied directly via computer, whereas before the pandemic, they had preferred to learn from printed notes or books and they more often learned from other students' notes. While students did not often ask others to test their knowledge before the pandemic, they did so even less during it. It is also crucial to note that students found it harder to start studying and stay focused during the pandemic.

Table 3. Descriptive Statistics for the Mode of Studying Items and Results for t-Test

	Mode of studying	Before Pandemic		During Pandemic		p	
		Mean	SD	Mean	SD		
1	I prepare carefully for studying (I take care of everything I need).	3.92	0.950	3.96	1.068	0.209	
2	I study alone.	4.53	0.711	4.57	0.784	0.191	
3	I study in pairs.	1.92	1.053	1.74	0.986	0.000	**
4	I study in a group.	1.64	0.871	1.48	0.822	0.002	**
5	I study with the help of mind maps.	2.26	1.215	2.20	1.244	0.093	
6	I study from the exams/tests.	3.28	1.227	3.24	1.310	0.232	
7	I study by completing tasks.	3.74	1.063	3.76	1.095	0.357	
8	I study by heart.	2.93	1.072	2.87	1.100	0.105	
9	I ask my classmates about unclear notions or terms.	3.42	1.165	3.35	1.198	0.097	
10	I find an explanation for unclear terms by myself.	4.01	0.860	4.05	0.917	0.159	
11	I ask the teacher about unclear notions or terms.	2.59	1.171	2.51	1.222	0.076	
12	I am using cheat sheets or other illicit devices (smart devices etc.) for exams.	1.50	0.840	1.65	0.903	0.001	**
13	I study from a book.	3.04	1.131	2.90	1.208	0.010	*
14	I study from my notes.	4.26	0.920	4.23	1.014	0.246	
15	I study from other students' notes.	2.58	1.251	2.43	1.259	0.002	**
16	I read the notes in e-format directly from my computer.	2.37	1.207	2.82	1.417	0.000	**
17	I study more easily from printed material than from a computer.	4.30	1.014	4.21	1.139	0.030	*
18	Before I finish studying, I ask someone to test me.	1.84	1.131	1.70	1.027	0.002	**
19	I find it challenging to connect theory with practical examples.	2.27	1.050	2.29	1.073	0.246	
20	I help myself with examples of other seminar assignments.	3.07	1.216	3.08	1.280	0.403	
21	I connect the learning material with other knowledge (also with other subjects etc.).	3.63	0.979	3.64	1.038	0.365	
22	I need help or instructions.	1.68	0.923	1.70	0.964	0.357	
23	I learn with pleasure.	3.05	1.116	2.99	1.192	0.128	
24	I revise the studied material.	3.41	1.063	3.39	1.096	0.371	
25	I find it hard to start studying.	3.25	1.160	3.42	1.233	0.006	**
26	I find it challenging to stay focused – while studying, my thoughts tend to wander.	3.13	1.092	3.34	1.165	0.001	**
	Overall	2.99	0.329	2.98	0.377	0.427	

*: $p < 0.05$; **: $p < 0.01$

Re-designing the educational process from face-to-face to distance learning resulted in different patterns of student behaviour during lectures. This was confirmed by statistically significant differences for all *learning during lectures* items (see Table 4). Before the pandemic, students took notes more often, memorized more during lectures and participated in discussions more often. Classes seemed less interesting to them during the pandemic, but they also estimate that they learned more by writing seminar papers.

Table 4. Descriptive Statistics for Learning During Lectures Items and Results for t-Test

		Before Pandemic		During Pandemic		<i>p</i>	
		Mean	SD	Mean	SD		
1	I take notes during lectures.	4.01	1.071	3.58	1.241	0.000	**
2	I remember a lot from the lectures.	3.82	0.894	3.53	1.017	0.000	**
3	I get bored during lectures.	2.63	0.945	2.97	1.026	0.000	**
4	I learn a lot by participating in discussions.	3.64	1.063	3.45	1.182	0.000	**
5	I learn a lot by writing seminar papers.	3.27	1.156	3.40	1.210	0.002	**
	Overall	3.48	0.534	3.38	0.572	0.002	**

*: $p < 0.05$; **: $p < 0.01$

Statistically significant differences in the *social elements* sub-module were revealed for items 1 and 2 (see Table 5). During the pandemic, fewer jobs were available for students. This could be one of the reasons why students devoted less time to student employment during the pandemic and more time to sleep compared to the time before the pandemic, as the test results show.

Table 5. Descriptive Statistics for Social Elements Items and Results for t-Test

		Before Pandemic		During Pandemic		<i>p</i>	
		Mean	SD	Mean	SD		
1	I also have a full or part-time job while at university.	3.45	1.534	3.19	1.681	0.004	**
2	I get enough sleep.	3.44	1.162	3.70	1.107	0.000	**
3	I have healthy eating habits.	3.56	1.059	3.63	1.145	0.159	
4	The course is a big responsibility for me.	4.19	0.837	4.22	0.926	0.177	
	Overall	3.66	0.700	3.68	0.752	0.282	

*: $p < 0.05$; **: $p < 0.01$

In addition to studying habits, we were also interested whether there were changes in studying time. Students indicated how much time, on average per day, they studied before and during the pandemic. The results are presented in Table 6.

Table 6. Descriptive Statistics of Studying Time Items and Results for Proportions Test

Studying time	Before pandemic	During pandemic	<i>p</i>	
Up to two hours	69.9 %	65.5 %	0.086	
Two to four hours	25.8 %	26.8 %	0.407	
More than four hours	4.2 %	7.7 %	0.030	*

*: $p < 0.05$; **: $p < 0.01$

Sample results show that the proportion of students with longer studying times was higher during the pandemic. Using the one-tailed Paired-Samples Proportions Test, it was confirmed that the proportion of students who studied for more than four hours per day on average was statistically significantly higher than before the pandemic.

To identify advantages and barriers that distance learning has introduced during the pandemic and how these affect students' studying habits, we inferred from responses to the 19 elements listed in Table 7. Students were asked to indicate the level of agreement on a 5-point Likert-type scale from "1=I do not agree at all" to "5=I agree completely". Mean values of responses with standard deviations are also given in Table 7.

Table 7. *Descriptive Statistics of During-the-Pandemic Items*

	Advantages and barriers of distance learning	Mean	SD
1	During the pandemic, my motivation to study has dropped.	2.85	1.318
2	During the pandemic, I have spent more time studying.	2.96	1.192
3	During the pandemic, I have needed assistance more often.	2.37	1.098
4	Studying has seemed much more difficult to me during the pandemic.	2.67	1.291
5	During the pandemic, I have been under more stress due to my studying.	2.71	1.266
6	During the pandemic, my communication with classmates has declined.	3.64	1.270
7	During the pandemic, my collaboration with classmates has declined.	3.48	1.309
8	The pandemic has drastically changed my studying habits.	3.09	1.229
9	Due to the pandemic, I have not had a suitable studying environment/space.	2.15	1.115
10	The pandemic has increased my digital literacy (the ability to find, evaluate and compile clear information through the use of computer programs and tools).	3.59	1.111
11	Due to the pandemic, I have lowered my learning goals.	2.10	1.111
12	I have not had the appropriate ICT equipment to study during the pandemic.	1.85	0.944
13	I have not had a suitable internet connection to study during the pandemic.	1.98	1.026
14	Teachers have been less accessible during the pandemic.	2.12	0.932
15	Teachers have been less interested in teaching during the pandemic.	2.13	0.974
16	Assessment of knowledge during the pandemic has not been appropriate.	2.27	1.054
17	Due to the pandemic, I have had difficulty accessing learning material.	2.75	1.164
18	I prefer distance learning to traditional learning.	3.16	1.410
19	Distance learning gives me more flexibility.	3.93	1.201

The item with the highest mean value (3.93) was item 19, "Distance learning gives me more flexibility." This was also the only item for which the one-tailed One-Samples t-Test confirmed an average agreement score statistically significantly higher than 3.5 ($t=5.156$, $p=0.000$), which confirms that distance learning for students represents a more flexible form of study compared to the classical one. The item with the lowest mean value (1.85) was item 12, "I have not had the appropriate ICT equipment to study during the pandemic." The one-tailed One-Samples t-Test confirmed that students on average disagree with statements 3 ($t=2.368$, $p=0.042$), 9 ($t=1.148$, $p=0.000$), 11 ($t=2.100$, $p=0.000$), 12 ($t=1.851$, $p=0.000$), 13 ($t=1.981$, $p=0.000$), 14 ($t=1.124$, $p=0.000$), 15 ($t=2.129$, $p=0.000$) and 16 ($t=2.268$, $p=0.001$), as the average agreement score is statistically significantly lower than 2.5.

A one-tailed Independent Samples t-Test was used to study the differences in the presented items according to gender (male, female), level of study (undergraduate, postgraduate), type of study programme (regular, part-time), and field of study (social sciences, natural and technical sciences).

In studying gender differences, a significant difference was found for item 6, “During the pandemic, my communication with classmates has declined.” The average agreement score for male students was found to be higher than that for female students ($t=2.143, p=0.017$).

When comparing student responses by the level of study, differences were confirmed for items 1, “During the pandemic, my motivation to study has dropped.” ($t=3.333, p=0.001$), and 15, “Teachers have been less interested in teaching during the pandemic.” ($t=2.491, p=0.007$). For both items, undergraduate students’ average agreement score was higher than that of postgraduate students.

Analysis for the type of study programme showed significant differences for items 1, “During the pandemic, my motivation to study has dropped.” ($t=3.746, p=0.000$), 7, “During the pandemic, my collaboration with classmates has declined.” ($t=2.096, p=0.019$), and 8, “The pandemic has drastically changed my studying habits.” ($t=3.195, p=0.001$). For all these items, the average agreement score for regular students was found to be higher than for part-time students.

In terms of field of study, the average level of agreement proved to be significantly different in more than half of the items when comparing groups of students. For all the following items listed below, the average agreement score for students of natural and technical sciences was found to be higher than that for social sciences students: 1, “During the pandemic, my motivation to study has dropped.” ($t=1.671, p=0.048$), 2, “During the pandemic, I have spent more time studying.” ($t=1.836, p=0.034$), 3, “During the pandemic, I have needed assistance more often.” ($t=2.441, p=0.008$), 4, “Studying has seemed much more difficult to me during the pandemic.” ($t=2.001, p=0.023$), 8, “The pandemic has drastically changed my studying habits.” ($t=1.706, p=0.045$), 9, “Due to the pandemic, I have not had a suitable studying environment/space.” ($t=2.018, p=0.022$), 11, “Due to the pandemic, I have lowered my learning goals.” ($t=1.907, p=0.030$), 12, “I have not had the appropriate ICT equipment to study during the pandemic.” ($t=1.890, p=0.030$), 14, “Teachers have been less accessible during the pandemic.” ($t=2.281, p=0.012$), and 16, “Assessment of knowledge during the pandemic has not been appropriate.” ($t=2.677, p=0.004$).

As the analysis of students’ studying habits showed that during the pandemic they have found it harder to start studying and to concentrate, they got bored during lectures, and used illicit devices for exams, we also checked whether this was due to specific barriers of distance learning (16 items were selected from Table 7). For this purpose, Pearson Correlation analysis was used. The results are presented in Table 8.

Table 8. Correlation Analysis Results

Correlations	I am using cheat sheets or other illicit devices (smart devices etc.) for exams.	I find it hard to start studying.	I find it challenging to stay focused – while studying, my thoughts tend to wander.	I get bored during lectures.
During the pandemic, my motivation to study has declined.	0.243**	0.431**	0.383**	0.444**
During the pandemic, I have spent more time studying.	-0.131*	0.104	0.103	0.085
During the pandemic, I have needed assistance more often.	0.059	0.207**	0.219**	0.163**
Studying has seemed much more difficult to me during the pandemic.	0.020	0.240**	0.229**	0.181**
During the pandemic, I have been under more stress due to my study.	0.027	0.271**	0.288**	0.138*
During the pandemic, my communication with classmates has declined.	-0.024	0.105	0.119*	0.077
During the pandemic, my collaboration with classmates has declined.	0.001	0.154*	0.120*	0.085
The pandemic has drastically changed my studying habits.	0.032	0.099	0.144*	0.209**
Due to the pandemic, I have not had a suitable studying environment/space.	0.046	0.116*	0.153*	0.151*
Due to the pandemic, I have lowered my learning goals.	0.130*	0.226**	0.222**	0.259**
I have not had the appropriate ICT equipment to study during the pandemic.	0.006	0.015	0.091	0.125*
I have not had a suitable internet connection to study during the pandemic.	0.056	0.138*	0.187**	0.224**
Teachers have been less accessible during the pandemic.	0.125*	0.037	-0.009	0.310**
Teachers have been less interested in teaching during the pandemic.	0.256**	0.111	0.087	0.373**
Assessment of knowledge during the pandemic has not been appropriate.	0.105	0.165**	0.104	0.371**
Due to the pandemic, I have had difficulty accessing learning material.	0.040	0.115	0.148*	0.220**

*: $p < 0.05$; **: $p < 0.01$

Discussion

The COVID-19 pandemic has caused many changes in education. In this research, we tried to determine whether the changed modes of studying have also caused changes in the studying habits of higher education students. We found that the modes of studying have indeed had an impact and changed certain studying

habits of students, but not all of them. Changes in studying time, i.e., when students study (morning, afternoon, evening or night) were noticed. Before the pandemic, students studied more in the morning and at night, while during the pandemic, they have tended to study more in the afternoon and evening. This could be related to the restricted movement and prohibition of specific activities and socializing and the decline in student employment during the pandemic. Instead of going out with friends, doing sports activities, or working in the afternoon and evening, students could study. We did not detect changes in the duration of studying, except for those studying for four or more hours a day. The proportion of students with longer studying time during the pandemic was higher. Although Li and Lalani (2020) state that some research shows that students can learn faster online and that e-learning requires 40–60% less time to learn than a traditional classroom setting, we did not identify a shorter duration of studying. There were no differences in preparing the schedule or curriculum or studying breaks. Those who carefully planned before the pandemic and took breaks continued to do so during the pandemic. Students stated that they had no problems organizing studying time and combining it with other responsibilities. For some, it was even easier.

As expected, students studied more often in the library or with classmates before the pandemic and more often at home, usually in the same room, during the pandemic. In Slovenia, libraries were closed for a few months, and socializing outside the household was not permitted. We think these are the main reasons for students staying and studying at home. However, there were no changes detected regarding distractions during study. Those who could provide a learning environment free from distractions (telephone, television, radio, etc.) before the pandemic also maintained this during it.

Students who already studied from exam assignments before the pandemic also did so during it. They also asked classmates or teachers for clarifications to the same extent as before. So despite stating that communication and collaboration with classmates had diminished, they remained connected and helped each other in cases of unclarity. It turned out that before the pandemic, they had studied primarily from classical textbooks and used other students' notes, while during the pandemic they studied more from e-materials, despite stating that they found it easier to learn from printed than from electronic sources. In many cases, they had no choice but to study from electronic sources, either because of the movement restriction and inability to access written material or because they did not have printers and could not print notes.

It turned out that the students did not have any problems in combining theoretical and practical knowledge or with connecting the learning material with other knowledge (also with other subjects etc.) as a result of the new mode of studying. But it was harder for them to start studying during the pandemic, they had problems staying focused and their thoughts tended to wander. This can be related not only to a decline in motivation, but also to the pandemic situation itself. Pudelko (2020) says that research in cognitive sciences today confirms what we know intuitively: learning requires attention, time and mind availability. We are paying attention to emotionally charged information. Not surprisingly, then, in a

context full of messages about the dangers of the pandemic, students find it difficult to focus sustainably on their studies.

We did not find any statistically essential differences related to stress due to study before and during the pandemic. Some students stated that distance learning is more suitable for them because there is no contact with people, which otherwise causes them the most stress. On the other hand, Kapasia et al. (2020) found that students have faced stress, depression and anxiety during the pandemic that has affected their learning.

Our research showed that students who had difficulties studying and staying focused lowered their learning goals and have not had a suitable studying environment/space during the pandemic. We also found that students who have needed a little more help/instructions during the pandemic have had difficulties staying focused and were bored during lectures.

In addition, we found a slight increase in the use of cheat sheets and other illicit devices (smartdevices etc.) during exams during the pandemic. We might attribute this to the more complex control of cheating in remote knowledge testing and students finding it easier to cheat. Reedy et al. (2021) also discovered that some students perceived cheating to be easier in online exams. But we also associated this factor with a decline in motivation and students lowering their learning goals. The research also connects the increased use of illicit devices with students' opinions that teachers have been less accessible and less interested in teaching during the pandemic. We think that all these factors encouraged students to use illicit devices during exams.

We were surprised that students took notes to a greater extent before the pandemic than during it. It also turned out that they remembered more from the lectures before the pandemic. It seems that students perceive the teacher and the courses differently live than over the net and therefore retain more. As already mentioned, students have been more bored during lectures during the pandemic than they were before it. That explains why they learned less by participating in discussions and more by writing seminar papers. Chakraborty et al. (2021) also found that students feel that they can interact better with professors in a physical classroom. As with some other factors, the increase in boredom during lectures was also associated with decreased motivation. The research showed that increased boredom during classes is associated with students lowering their learning goals and the opinion that teachers are less accessible during the pandemic and less interested in teaching. Higher boredom was also related to students' view that assessment of knowledge during the pandemic has not been appropriate and difficulties with accessing learning material. Kundu and Bej (2021) also found that many students were critical of the online multiple-choice question and the effectiveness of this type of examination.

As already mentioned, student employment turned out to have declined during the pandemic. Students were more likely to report getting enough sleep during the pandemic than before, which may also be related to the decline in student employment. Other studies also reported that students had extended their sleep time during the pandemic. Wright et al. (2020) found that students increased their sleep duration by 30 minutes during weekdays and 24 minutes at weekends.

The percentage of those who had seven or more hours' sleep per night increased from 84% to 92%. Blume et al. (2020), meanwhile, found that sleep duration had increased by 13 minutes.

Eating habits did not change during the pandemic, nor did the attitude towards study. Those for whom study represented a great responsibility before the pandemic said that it also did during it. The pandemic also did not affect regular revising of course material or learning pleasure.

We found that specific changes in studying habits are mostly not related to inadequate ICT equipment, poor internet connection, reduced communication with classmates or reduced collaboration with classmates. But we identified some changes related to less accessibility of teachers and students' perception that teachers are less interested in teaching. Some students stated that they have had problems with more demanding material in school because communication with professors is more complicated.

The study showed that online learning for students represents a more flexible learning form than the traditional one. Despite the decline in student employment, some students stated that the greater flexibility due to distance learning has allowed them to work regularly. Many stated that they have gained time for learning because they do not have to commute to lectures. They say the pandemic has even made their courses more accessible. Several other researchers also found that the main advantage of online learning was its flexibility. Gherhes et al. (2021) found that the surveyed students considered the main benefits of online learning during the pandemic: flexibility of working time, the comfort of working from home and the variety of documentation sources, while Muthuprasad et al.'s (2021) results indicate that flexible schedules and convenience are the major benefits of online learning. Online education offers students the opportunity to study at their own pace and at a time of their convenience. Hence flexibility and convenience are significant drivers behind the demand for online education.

Conclusion

The study found that the pandemic has caused specific changes in students' studying habits, especially in terms of when and where they study, with whom they study, how they take notes during lectures, how they participate in discussions, and how much sleep they get. However, it has not affected the preparation for learning itself, cooperation in cases of uncertainty, learning sources or the need for additional help.

More than study habits, the new mode of working has affected the well-being of students. They largely missed socializing with classmates and contact with their teachers. Some stated that they were lazy at first but got back into a routine quickly and got used to it and that they would even have a problem going back to the faculty again. Many believe that distance learning should be introduced as a permanent mode of learning or at least allow a choice between traditional and online learning. For some, online learning is very convenient, and some even do not wish to return to the traditional classroom. They state that online learning is

better in terms of time and finances and is more comfortable and that such learning does not seem more difficult.

Thus it would make sense in further research to examine what suits students in their study, what they like about online learning and what they miss to enrich the online learning experience. In all likelihood, future studies will need to be more tailored to the needs of the individual. From the students' answers here, it can be seen that online learning has proved to be much more suitable for some, while others wish to return to the traditional classroom and lecture hall. Some students state that it has been a positive experience for them and refer to there being no commutes to faculty, to the comfort of home, and to adequate toilet breaks and refreshments. One of them also stated that his grade point average had risen during the pandemic. As a negative experience, many students mention the lack of personal socializing with classmates, but this is not an especially worrying issue for others, because they are connected via Zoom and Messenger. One student also wrote that everything is good for something: you just have to look at the situation positively. Again others hope to get back to the faculty as soon as possible. Furthermore, the wishes and needs of individuals are also very different depending on the field of study. Therefore it would be reasonable to focus further research on the possibility of adapting courses to individual needs or individual students' studying habits not just during the pandemic.

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Distance Education Experiences of Teacher-Parents during the COVID-19

Derya Güvercin, Ayşe Elitok Kesici & Sait Akbaşlı

This research aimed to determine the opinions of teacher parents about distance education process during COVID-19. The study was designed as a case study which is one of the methods in qualitative research. The sample of the study composed of 83 teacher parents from different branches in Turkey. Maximum variation and criterion sampling methods were used to select the participants. The data of the study were gathered through open ended questions developed by the researchers and were analyzed through descriptive and content analyses. According to the participants, distance education is perceived and accepted as a means of support rather than an alternative to face-to-face education. Participants mentioned the distance education carried out during the pandemic process as a beneficial practice in order to prevent students from breaking off from education but also they stated administrative issues, lack of computer science knowledge and internet-related problems. The inability to disseminate distance education to all students, especially disadvantaged students due to the lack of infrastructure, indifferent parents and the fact that distance education is insufficient in the education of young children/special education students show that distance education has not yet met the expectations to provide equal opportunities for everyone involved.

Keywords: COVID-19, distance education, pandemic, teacher, parent

Introduction

The COVID-19 pandemic, which has affected the whole world, has also affected educational organizations, causing face-to-face education to be suspended and transition to distance education. According to Tedmem (2020), the number of countries that closed all schools from pre-school education to higher education at the beginning of April was 193. In a few other countries, the majority of schools were closed by local-level decisions in terms of administrative structure. In total, the number of students affected by the closure of schools exceeded 1 billion 724 million. Countries that shut down schools decided to continue education with distance learning tools. Distance learning is carried out by using tools such as printed teaching materials, radio broadcasts, television broadcasts, online teaching contents or online interactive lessons according to the technological infrastructure and opportunities of the countries (Tedmem 2020). Although there are studies showing that the closure of schools provides benefits in controlling the epidemic (Tian et al. 2020, Kwok et al. 2020), data obtained from the SARS outbreak in China, Hong Kong and Singapore show that there is no significant contribution at all. Recent studies on COVID-19 have predicted that school closure will prevent deaths by 2-4%, which is much less than other social distance interventions (Viner et al. 2020).

Today, online learning has shown a great development (Borup and Kennedy

2017) and distance education studies have increased in countries such as United States, Canada, Mexico, Australia, New Zealand, Singapore, South Korea and Turkey, especially at the primary and secondary school level (Barbour 2017, Harris et al. 2020). Distance education is considered as an inclusive and equality-enhancing factor for K-12 students who have difficulties in accessing education (Buckingham 2017, O'Donoghue et al. 2011, Harris et al. 2020). On the other hand it is claimed that it may cause more educational exclusion for special education students (Slee et al. 2019, Slee 2011). During quarantine period, at least 9 out of 10 students continued their education away from school buildings (Hale et al. 2020). Despite the measures taken, it has been determined that among countries and among different income groups in the countries, students experience problems in accessing internet and technology and therefore cannot participate in distance education. According to OECD data, 95% of students in Switzerland, Norway and Austria have a computer to use in their schools, while only 34% in Indonesia have a computer (Reimers and Schleicher 2020). Families, on the other hand, had to take more responsibility for their children's education (Yılmaz et al. 2020). Students also faced some problems about assessments and exams, post-traumatic stress disorder (Tedmem 2020). UNESCO (2020), by establishing a global education coalition unit, tried to take the necessary precautions to ensure that countries do not experience disruptions in education. Governments tried to adapt their education systems to emergency remote teaching by turning them into distance education. The general aim of Emergency Remote Teaching (ERT) in time of pandemic is to provide temporary instructional support and a flexible learning environment for short term solutions (Hodges et al. 2020, Bozkurt and Sharma 2020).

During the pandemic, teachers who have school-age children have assumed a double-sided role as both parents and teachers. This situation, which enables them to see this process from both sides, is important for the effective planning, management and implementation of education in such crisis situations. With this study, it is thought that the opinions of education professionals who assume the responsibilities of both teachers and parents on distance education will contribute to the literature.

Purpose of the Study

The aim of this study is to reveal the various experiences of teacher-parents during distance education due to the COVID-19 outbreak. For this purpose, participants were asked following questions:

1. What kind of changes has occurred in your daily life during the distance education process due to the COVID-19 outbreak?
2. What kind of institutional/individual studies have you done regarding your child's education in the distance education process?
3. What kind of institutional/individual studies have you done for the education of your students during the distance education process?
4. What were the most challenging areas for you both as a parent and an

education worker in the distance education process? In what areas did you need support? How did you deal with the challenges you faced?

5. How do you evaluate the distance education process experienced in terms of your children and students?
6. What are your views on the effectiveness of the distance education process as both a parent and a teacher?
7. What are your suggestions for a more efficient distance education process?
8. Is there any situation you would like to add other than the above questions? If there is, add it.

Methodology

The research was organized in a case study pattern in qualitative research method. In the case study design, the factors (environment, individuals, events, processes, etc.) of a situation are investigated with a holistic approach and the focus is on how they affect the relevant situation and how they are affected by the relevant situation (Bogdan and Biklen 1998, Yıldırım and Şimşek 2011). Because the case is a system with both definite boundaries and related components, it is also defined as an in-depth description and examination of a system (Creswell 2011, Merriam 2013). Therefore one of the researcher's primary goals is to identify unique aspects of this specific case (Christensen et al. 2011).

Study Group

The participants of the research consist of teachers who are also parents and are involved in the distance education process due to the COVID-19 outbreak. Criterion sampling and maximum variation under purposeful sampling methods were used to determine the work group (Büyüköztürk et al. 2012, Yıldırım and Şimşek 2011). The reason to prefer criterion sampling is that it selects the cases that will provide maximum information for the problem and ensures that case studies about the problem are covered in the research (Neuman 2007, Patton 2002). In this study, the people involved in the distance education process as both parents and education workers are the subject of the study. At the same time, diversity of the teachers in the study group in terms of school type, level, seniority and branch were taken into consideration.

Data Collection Tools

The data of the study were obtained through an online questionnaire called "Educational Experiences of Teacher-Parents during the COVID-19 Outbreak" developed by the researchers. In the survey, the experiences of teacher-parents during the COVID-19 outbreak were collected through open-ended questions. Survey technique is a systematic data collection technique that is used to obtain information from individuals who make up a universe or sample about a particular subject (Yılmaz et al. 2020). The surveys conducted for the purpose of collecting

data are used to determine the socio-economic levels of people, the degree of the effects of the situation, to obtain information about the participants, to define the risks in the existing situation, etc. (Kudat 2002). In addition, various demographic variables of the participants were included (gender, seniority, branch, school type (private/public), school level (kindergarten/primary school/secondary school/high school), number of children, school level of the child).

Data Analysis

In the analysis of data, descriptive analysis and content analysis techniques, which are data analysis techniques used in qualitative research, were used (Gökçe 2006, Bogdan and Biklen 1998). The frequency and percentage scores of the data were given. For validity and reliability analyses; direct quotations of participants are given in examples, codings are controlled over different coders. According to Miles and Huberman (1994) reliability of a qualitative study increase if two coders study on the same data set and reach out a common vision about what the encodings mean and which piece of data belongs to which code. Also by audit trail technique it was verified that each interpretation is indeed based on the dataset. In order to maintain the integrity of the researcher, develop his/her hypotheses, and shape the research design, the researcher opens himself to the supervision of a colleague who is not involved in the study and receives support from him (Lincoln and Guba 1986).

Results

In this section, personal information of the participants is given and their responses to the open-ended questions in the questionnaire were divided into categories by coding, and as a result, themes were created (Table 1). The answers given by the teachers were evaluated one by one over the questions. The frequency values and percentages of the codes are tabulated and the answers deemed important are presented as examples. Findings are as follows.

Table 1. *Personal Information about Participants*

Personal Information	
Gender	Female: 73.5%
	Male: 26.5%
Professional seniority	0-5 years: 1.2%
	6-10 years: 7.2%
	11-15 years: 26.5%
	16-20 years: 38.6%
	20 years and above: 26.5%
Branch	Primary school teacher: 37.2%
	Maths: 9%
	Preschool/kindergarten: 7.7%
	Art: 6.4%
	Special education: 6.4%
	Physical education: 5.1%

Distance Education Experiences of Teacher-Parents during the COVID-19

	Turkish: 5.1%
	Social sciences: 3.8%
	Design and technology: 2.6%
	German: 2.6%
	Turkish Literature: 2.6%
	School counselor: 2.6%
	Geography: 1.3%
School Type	English: 1.3%
	Science: 1.3%
	Physics: 1.3%
	Elektronics: 1.3%
	Biology: 1.3%
	Religion: 1.3%
	State school: 92.7%
	Private school: 7.3%
School Level	Kindergarten: 3.7%
	Primary school: 47.6%
	Secondary School: 26.8%
	High school: 22%
School level of children	Kindergarten: 20.3%
	Primary school: 49.4%
	Secondary School: 43%
	High school: 32.9%
Number of children	1 child: 22.9%
	2 children: 65.1%
	3 children: 12%
Number of consults to the hospital because of the suspicion of COVID-19 (among oneself, students or colleagues)	Yes: 6%
	No: 94%
COVID-19 diagnosis taken among participants of the study	Yes: 0%
	No: 100%
COVID-19 diagnosis taken in participant's environment (student/parents/colleagues)	Yes: 7.3%
	No: 92.7%
Deaths because of COVID-19 in participant's environment	Yes: 8.5%
	No: 91.5%

After the personal information module, 7 open-ended questions were asked to the participants to learn about their experiences during pandemic. The answers of participants were given without any changes. The findings of the questions are given sequentially below.

Question 1: What Kind of Changes have occurred in your Daily Life during Distance Education Process Due to the COVID-19 Outbreak?

Participating teachers reported those changes as: increased stress and anxiety, more interest in technology and self-development, staying at home, restriction of social life, the beginning of the distance education process and adaptation to this process, transition to a different lifestyle, spending more time on the internet, increased use of mobile phones for communication, spending more time on yourself and the family. Some participants stated that there was no change in their lives during this period (Figure 1). When the codings were evaluated, three

categories were reached. These are: adaptation to the distance education process, psycho-social change and no change. Some of the answers given by the participants to this question are as follows:

Examples for Category 1 (Adaptation to the Distance Education Process):

- K2: I researched and learned some computer programs for distance education.
- K16: Online education has entered our life. We followed the lessons online.
- K48: I started using phones and computers a lot.

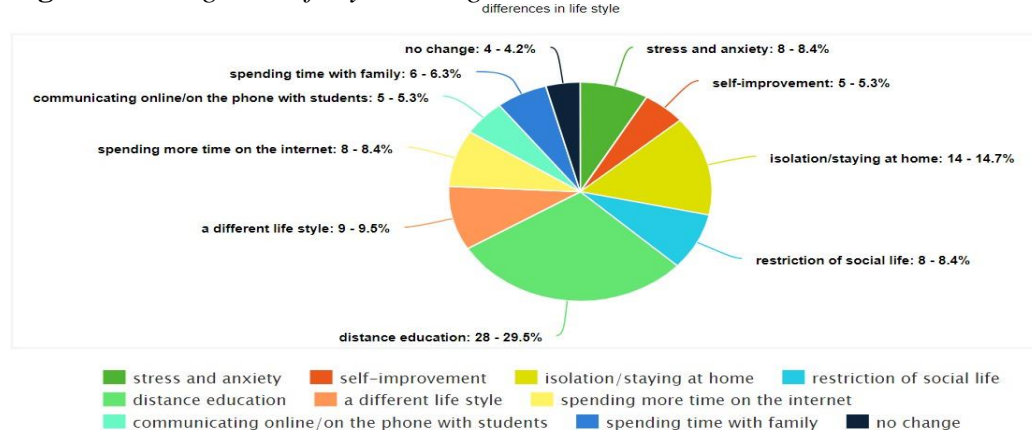
Examples for Category 2 (Psycho-Social Change):

- K44:... I miss going out and talking to someone. Trust problems occurred. Staying distant to everyone due to the possibility of being sick, and getting used to cleaning paranoidly every time we came from outside came into our lives.
- K53: I cannot see the faces of my students, I cannot hug and kiss them like every day, I do not know what materials my students have at home while choosing my activities, I do not want families to go out to buy materials.
- K80: Doing distance education activities both for my children and students together and being isolated from our life outside home due to the epidemic started to be a bit tiring and boring.
- K25: Wasting time has decreased. I was able to read more books and spend time for myself and my family.

Examples for Category 3 (No Change):

- K22: There was no particular change.
- K68: We seem to be spending the summer vacation at home. Not much has changed

Figure 1. *Changes in Lifestyle During the COVID-19 Process*



Question 2: What Kind of Institutional/Individual Studies have you done Regarding your Child's Education in the Distance Education Process?

Participants stated that they mostly used online and distance education tools in this process for the education of their children (Figure 2). They stated that they

managed the education process both through live lectures on EBA TV (Education and Informatics TV) and EBA application, and through lectures, online activities and studies, and trial exams from different online sources. Apart from that, they stated that they did activities such as doing homework, repeating the subject, solving tests/questions, benefiting from subsidiary resources, reading books, doing skill-based/art activities, playing games. Based on these codes, it was observed that the participants displayed behaviors in two categories, both in class activities and extracurricular activities, regarding the education of their children during the COVID-19 pandemic. An important point here is that the nature of the activities performed varies according to the age group of the child. While activities such as EBA TV, reading, domestic activities and doing homework are performed in the younger age group, activities such as test solving and exam preparation are dominant in the older age group. Below are some examples of the answers given by the participants that are deemed important:

Examples for Category 1 (Course Activities):

K32: We provided technological tools and communicated with his teacher. We ensured that he completed the assignments his teacher gave and participated in activities, and helped with matters he could not understand.

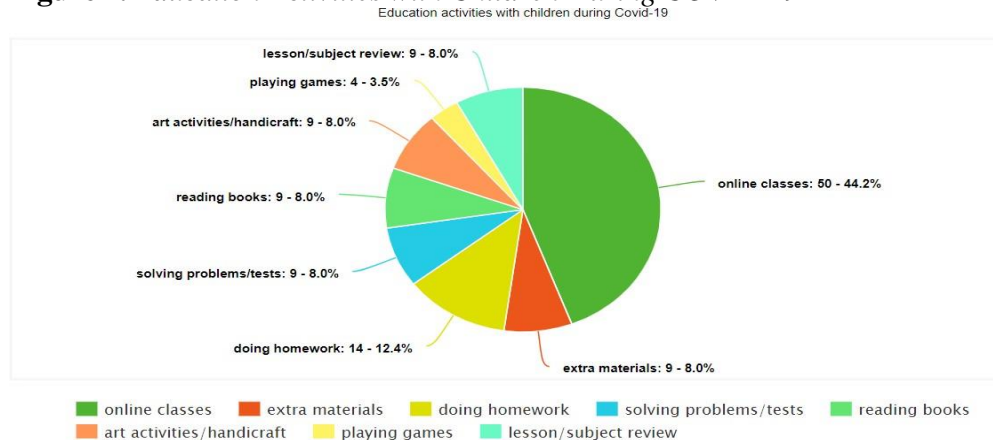
K71: Since my daughter was preparing for the exam, I found resources for her on the internet.

Examples for Category 2 (Extracurricular Activities):

K11: Cut, paint and paste activities, drawing line exercises, simple mathematical logic.

K73: We are doing exercises for focus attention and study from the math book, and also doing free activities with colored papers. He paints a lot.

Figure 2. Education Activities with Children During COVID-19



Question 3: What Kind of Institutional/Individual Studies have you done for the Education of your Students in the Distance Education Process?

According to the answers, teachers benefit from online education (distance education/live lesson/Skype/EBA TV etc.) the most for the education of their

students during the COVID-19 pandemic process, and extra material and activity sharing (lecture, worksheet, test, applied video, game, etc.) (Figure 3). They also stated that they communicated with students and their parents via smartphone applications (mostly WhatsApp) and phone calls, guided them, provided psychological support, and made the necessary announcements and information about the process. The assignment of students and the follow-up of the given assignments constituted another code group. They also performed games, art activities and domestic activities outside of the classroom. Thus, the activities of the participants for their students in the distance education process can be divided into three categories; activities related to course follow-up: extracurricular activities and other activities. Some of the answers given by the participants to this question are as follows:

Examples for the Category 1 (Activities Related to Course Follow-Up):

K17: I gave online classes. EBA, etc. I sent extra materials and followed them up. I called by phone and provided psychosocial support.

K32: I made one on one interviews, informed the parents about the up-to-date information about education, and shared activities suitable for their level with the students.

K51: I shot videos, prepared tests and shared a lot of other activities.

Examples for Category 2 (Extracurricular Activities):

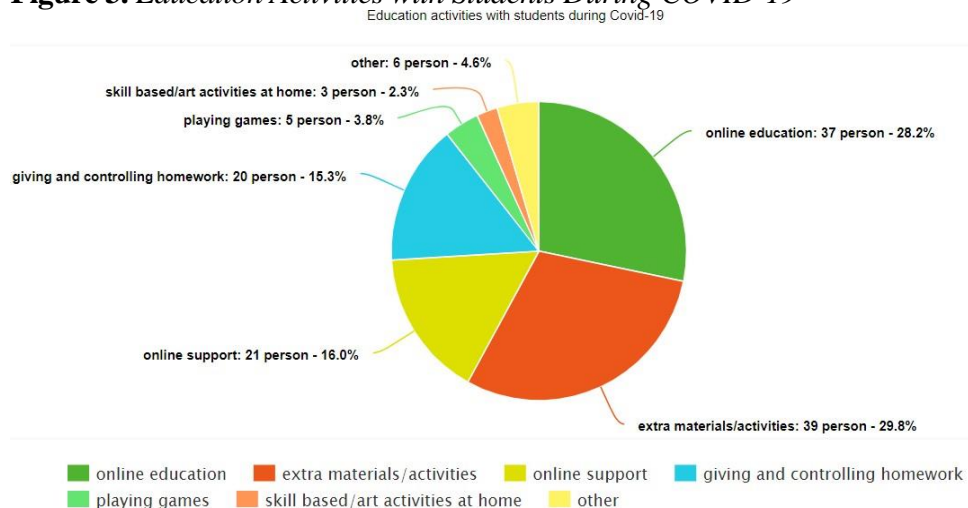
K79: I shot videos while lecturing, I suggested various artistic activities, they grow flowers and I give daily homework.

K18: We taught old games, shared our memories and told stories that will be lessons for life.

Examples for Category 3 (Other):

K52: E-twinning project events, 23 April and mother's day activities.

Figure 3. Education Activities with Students During COVID-19



Question 4: What were the Most Challenging Areas for you both as a Parent and an Education Worker in the Distance Education Process? In what areas did you Need Support? How did you Deal with the Challenges you Faced?

The difficulties stated by the participants were categorized in three: difficulties related to lesson follow-up, technological problems and psycho-social difficulties. The codes emphasized by the participating teachers in the lesson follow-up category were: intensity of the distance education process and excessive homework, problems related to the management of the distance education process (studying regularly, classroom management in online lessons, parent-teacher cooperation, parent indifference, etc.), communication problems and lack of material/resources (Figure 4). In the category of technological problems, participants expressed problems such as technical problems, lack of technological knowledge, the process of getting used to online classes and constraints based on equal opportunities. The psychological problems that the participants experienced during this process; motivation problems, boredom, digital addiction, feeling of restraint, stress, reluctance, and lethargy. The social problems they experienced were included in the code of restriction of the social environment. A small part of the participants stated that they did not encounter any difficulties in this process. Some of the answers are given below as an example:

Examples for Category 1 (Psychological and Social Difficulties):

K32: As an education worker, I needed the support and cooperation of parents. As a parent, I needed the support of the teacher. Not attending school makes it difficult to provide a complete school environment at home. Sleep pattern, meal time, etc. This negatively affects the study routine. In addition, the constant presence of children at home reflects negatively on their behavior. There is a state of reluctance and negligence. I received support from the teacher from time to time in this regard.

K51: Since it is not like face-to-face education, the motivation of the students decreases from time to time. So I call them and make them feel in control.

K79: Children need to spend their energy and it is very difficult to achieve this in apartment life, and sometimes games that can be played at home do not appeal to them.

Examples for Category 2 (Problems with Course Follow-up):

K20: Lecturing with a child nearby at home. It was not easy to direct children who were not near us.

K23: My child gets bloodshot eyes alone for hours in front of the screen. He started calling it “distance torture”, not distance education.

K36: Home, childcare, education altogether were hard to handle with.

K78: I could not reach my parents and students, I could not get feedback. My biggest problem was being able to communicate.

K80: I find most institutional postings useless, and unnecessary. While the special education area should be one-to-one and interactive, we send students educational content on the internet just to pretend to be doing something. It's

a futile effort for this area.

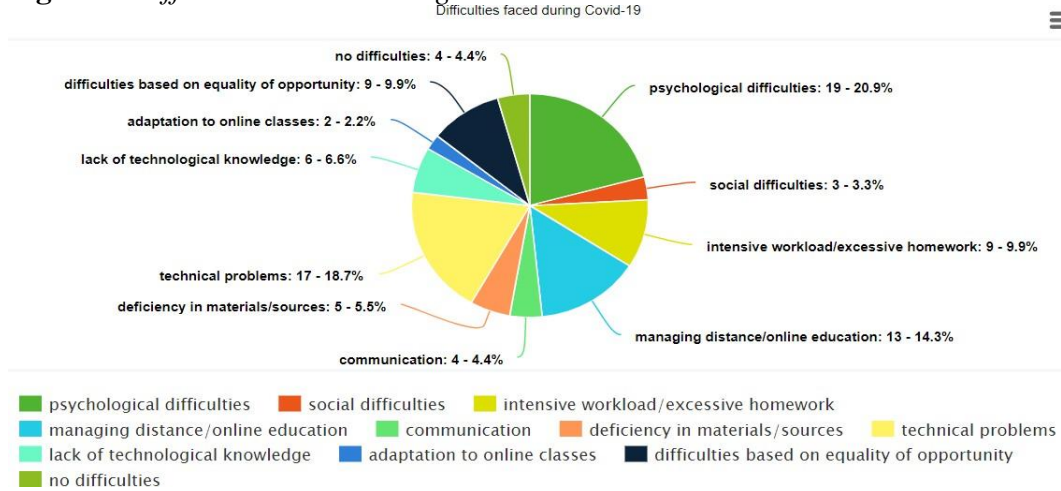
Examples for Category 3 (Technological Problems):

K55: My students had internet connection problems. There were students who went to their villages, and they experienced greater difficulties. The children who did not have internet were reached by phone and followed up by giving homework from the books.

K67: I find it difficult to keep my child going to live lessons. Because the connection is troublesome he does not want to continue. In addition, we sometimes have trouble doing homework.

K65: I saw that I have deficiencies in the use of information technologies. I am having problems reaching all of our parents and students. K64: My parents' lack of knowledge about the use of technology made communication difficult.

Figure 4. Difficulties Faced During COVID-19



Question 5: How do you Evaluate the Distance Education Process Experienced in Terms of your Children and Students?

It was observed that the majority of the participants (44.7%) evaluated the process negatively (Figure 5). The expressions used by the participants in the negative evaluation category were: "lingering, distraction, lost time, not like face-to-face education, not suitable for preschool and special education, an inadequate, boring, hectic process, no equal opportunities." The negative evaluation was followed by positive evaluations (25.9%) in terms of frequency, and then the difficulty of the process, indecisive views and "unexpected/unprepared situation" were mentioned. In their answers to this question, teachers generally mentioned that distance education cannot replace face-to-face education, it is inefficient especially for the younger age group and special education students, problems related to internet connection and impossibilities for equal opportunities. On the other hand, they stated that it was a positive practice for students not to break away from education. Some examples of answers to this question are as follows:

Examples for Category 1 (Positive Evaluation):

K16: I think it was the best thing to do in this process. The children did not break away from teaching and their teachers. Psychologically, it was good for them to see their teachers before them every day.

K25: It saves time, more time has been spent as a family, we have devoted more time to education, parents feel the value of teachers more effectively.

Examples for Category 2 (Negative Evaluation):

K28: The process was positive for students with family support. However, unwilling students who have no family support were affected by the process very negatively.

K40: I can say that it was beneficial for my child, but it did not work for special education students because I used the ba-sa method in the field of reading and writing but the sound method was used in EBA.

K44: It is not nice at all, it is more efficient to study face to face at school. Sociality ends at home. Children are not disciplined.

K63: Distance education via TV channel is good for lesson follow-up, but the online education application is not efficient. Not everyone can use the application because they do not have internet at home. Those who have internet also have connection errors and cannot attend most classes.

Examples for Category 3 (Unexpected/Difficult Situation):

K1: Something that happened for the first time and was caught off guard.

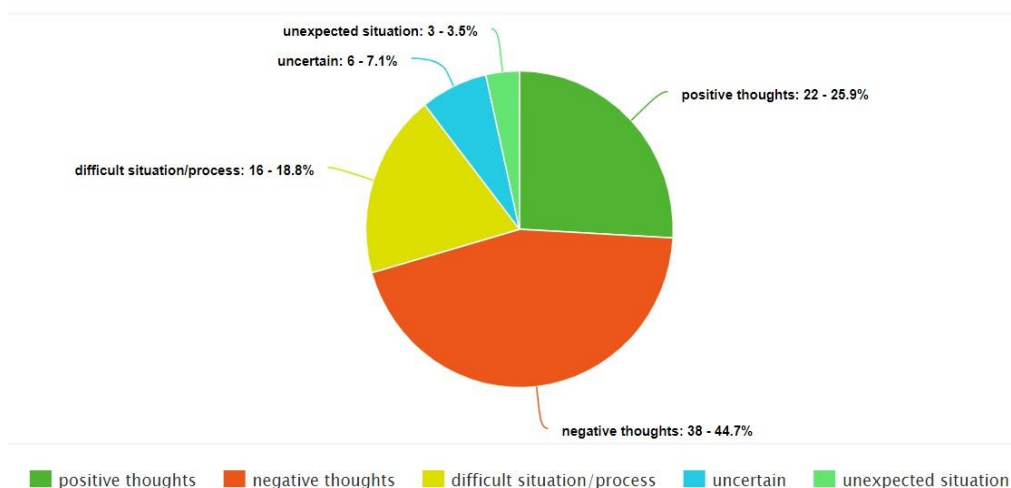
K52: It is a difficult process, both children and I missed school.

Examples for Category 4 (Undecided):

K22: This is questionable. For some it is sufficient, for some it is not.

Figure 5. Evaluation of Distance Education During COVID-19 Pandemic

Evaluation of distance education during Covid-19 pandemic



Question 6: What are your Views on the Effectiveness of the Distance Education Process as both a Parent and a Teacher?

Most of the participating teachers stated that the distance education process was partially effective (Figure 6). This view was followed by "ineffective", "effective" and "less effective" views, respectively. Some examples of answers to this question are given below:

Examples for Category 1 (Effective):

K19: Yes, it is a new system, but I think it ended up well and reached the desired quality and the efforts turned out well.

K56: Going positively, my son reinforced self-study.

Examples for Category 2 (Ineffective):

K37: I do not believe that it is effective, it only helped the children not to break off from school, but unfortunately the information transferring could not take place.

K58: It is difficult to make children sit the in front of the TV. For online classes, most of the students cannot login. The system is inadequate.

Examples for Category 3 (Less Effective):

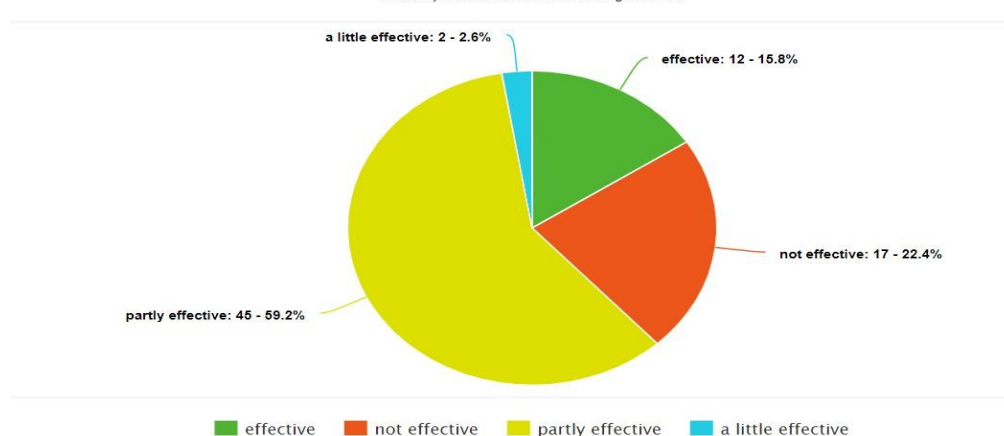
K64: I can say that it is below the average due to the lack of instant feedback and communication difficulties.

Examples for Category 4 (Partially Effective):

K2: I consider it an important program that should be applied in special cases where face-to- face education cannot be provided.

K41: Although it is not a substitute for face-to-face training, I think it is partially effective provided that parents' attention and sufficient technological equipment are provided.

Figure 6. *Efficiency of Distance Education During COVID-19*



Question 7: What are your Suggestions for a more Efficient Distance Education Process?

It is seen that the participants mostly emphasized the technical, infrastructure and internet access problems should be solved. Later, they mentioned that lessons should be planned better in the distance education process (Figure 8). In this category, they used the expressions like; simplifying the syllabus, better planning, less and meaningful homework, pre-lesson preparation, activities for younger age groups, and increasing the duration of the lesson. In addition, the participants also mentioned issues such as making students more active by increasing the interaction and participation in this process, raising the awareness of parents and students about the process, and especially providing parents with more support in the process. Elimination of resource/material deficiencies, increasing the knowledge of teachers and students in the field of information technology are also mentioned. Other codes, which are less mentioned but deemed important by the researcher, can be listed as: providing psychological support in the distance education process, involving distance education as a means of support in the normal education process and giving priority to psycho-social development. Thus, it is seen that the answers given fall into six categories. Some examples of participants' answers for these categories are given below.

Examples of Category 1 (Organization of Infrastructure):

K67: The internet connection problem should definitely be resolved. In addition, there should be online classes for lower classes. Seeing the student's face is very effective.

K78: Equality of opportunity ... a system accessible to all children and incentives to ensure that distance education is taken seriously by parents and students.

Examples of Category 2 (Lesson Planning):

K79: Homework related to real life experiences should be given more, for instance sewing a button, putting a nail on an empty board and growing a flower.

K32: Parents should provide students with a quiet and simple environment. The student must have headphones. Teachers should make good pre-lesson preparations to make the lesson interesting.

Examples of Category 3 (Increasing Participation):

K8: There is no sanction on students at the moment. This causes a decrease in participation and efficiency for online classes. Unfortunately, because not every student has the internet access, it prevents sanctions such as grading or attendance. Maybe some improvements can be made in the future.

K64: Parental education contributes to explain the importance of the distance education. Because the majority considers this situation as a holiday.

Examples of Category 4 (Eliminating Material Deficiencies):

K48: The course should not be taught monotonously, different materials should be used, not just the screen.

K35: I could not be more effective in distance education because we had difficulty finding materials in this process.

Examples of Category 5 (Increasing Information Technology Knowledge):

K31: Teachers' and students' knowledge of information technology usage should be increased.

K37: All teachers should be trained, subjected to examinations and self-improvement in distance education periodically, but all these should be real, not perfunctorily.

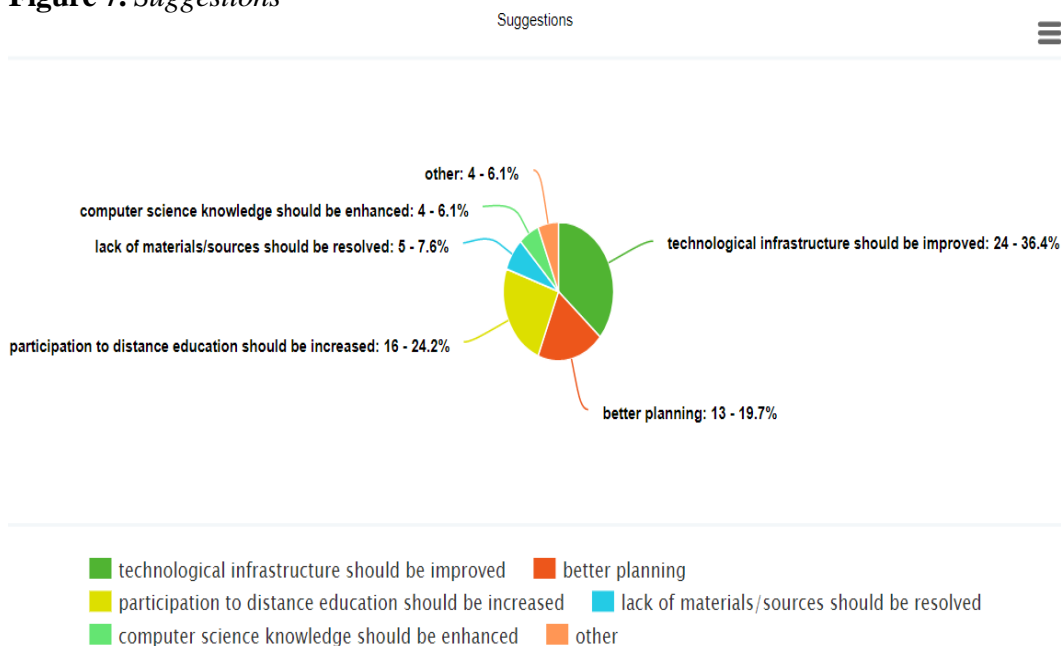
Examples of Category 6 (Other):

K2: Psychological support can be given to our students in primary and secondary education institutions more frequently.

K9: Distance education should be included in our education life from now on as supportive education. Technology and digital education will be essential to both parents and educators from now on.

K80: An approach that prioritizes psycho-social development should be adopted instead of academic education.

Figure 7. Suggestions



Question 8: Is there any Situation you would like to add other than the above Questions? If there is, add it.

According to the most striking answers participants talked about issues such as "establishment of crisis units, ensuring equal opportunities, the oppressive

attitude of provincial and district National Education Directorates regarding the use of EBA, and the need to improve the distance education system". Examples of the answers given are as follows:

K1: A separate unit should be established as a scientific committee in such circumstances like earthquake, war, epidemic, etc. what to do should be scripted beforehand.

K2: The participation of each individual in the distance education process is very important. When we cannot reach even one individual, the principle of equality is damaged. In this case, it becomes clear that we will be more successful if the necessary technological equipment is provided to each student.

K23: In order to get points at EBA, teachers give lots of homework from every branch every day, which makes children get bored and they don't do homework anymore. They say we didn't have to work that much even when the schools were open. This is due to the fact that the school and provincial or district administration put lots of pressure onto teachers' shoulders.

K59: Although it is difficult to enter EBA, our entrance and the shares we make are scored and evaluated. I would like to inform that different studies are being done for the success of the students in our class, though not through EBA.

Discussion

The results of this study and the literature reveal results that support each other. Muilenburg and Berge (2005) listed the problems encountered in distance education as managerial problems, social interaction, academic competence, technical skills, learning motivation, technical support and internet access costs, in line with the findings of this study. While Lerra (2014) lists the main difficulties in distance education as connection problems and access to the internet, Gökbulut (2020) states that these difficulties have been largely eliminated in university-level education. Also in higher education, students' online presence was found to be related with student performance and there is evidence that both frequency and duration of students' online presence have a statistically significant impact on their final marks (Sharma et al. 2020). This finding also points to the finding about limitation of the distance education in younger age groups or children in need of special education in this study. Misirli and Ergulec (2021) also found that distance education is unsuitable for young children and students with special needs. In addition, the limited interaction with students in distance education and insufficient feedback from the teacher are some of the difficulties mentioned in other studies (De Oliveira et al. 2018, Muilenburg and Berge 2005, Tedmem 2020). Student's self-discipline plays an important role in this process. According to parents' opinions students acquired self-regulated learning skills and digital socialization during distance education process (Misirli and Ergulec 2021). In this study, the need for the active participation of parents in the education process during the

pandemic process was also emphasized. Family involvement in distance education includes sharing responsibility with the teacher and organizing the physical environment of the students in order to increase education and interaction (Borup et al. 2015). Parents' complaints about social isolation and increased screen time demonstrate the emergency remote teaching created a high responsibility on behalf of parents (Misirli and Ergulec 2021). In addition, the inability of teachers and students who are deficient to manage the distance education process effectively is one of the results that is compatible with previous studies (Heinich et al. 2002, De Oliveira et al. 2018, Stansfield et al. 2004). Tedmem (2020) stated that, in line with the results of this study, distance education during the epidemic cannot replace face-to-face education. It also touched upon the difficulties experienced by teachers in classroom management, receiving feedback, and student follow-up.

Prior studies on the psychological dimension of distance education, in line with the findings of this study, indicate that teachers, students and parents need support. Cao et al. (2020) revealed that 24.9% of undergraduate students experienced anxiety problems due to the COVID-19 outbreak. Lei et al. (2020) found that the rate of anxiety and depression in the quarantined group was higher than the non-quarantine group in a study conducted with a total of 1593 participants in the south-west region of China, with and without quarantine. Zhang et al. (2020), in a study on children with Attention Deficit Hyperactivity Disorder (ADHD), found that these children had worsening symptoms during the COVID-19 outbreak. Brooks et al. (2020) found strong evidence of the negative impact of the quarantine process on human psychology in their study by scanning three databases. These are often described as post-traumatic stress syndrome, confusion, and anger. Tedmem (2020), in its report, drew attention to the same problem and stated that teachers both struggled with stress and tried to support their students, and emphasized how difficult it was to try not to drown students in homework and activities, to keep them in the process, to motivate and support them in the distance education process. In this case, it was underlined that teachers should also be supported psychologically, informed about psychological provincial help, and their well-being should be ensured (OECD 2020, Unesco 2020, WHO 2020). In terms of equal opportunity, Tedmem (2020), in line with the issues stated by the participant teachers, stated that teachers expect quite difficult days to compensate for learning losses and reduce the differences among students on their return to school. Unesco (2020) also drew attention to the urgent need to plan and prepare teachers to reduce inequalities in this regard. The Ministry of National Education (MoE) announced that remedial training will be carried out to compensate for training deficiencies.

Conclusion and Suggestions

As a conclusion, it is possible to make a SWOT analysis about emergency remote teaching process during COVID-19 pandemic by looking at the educational experiences of teacher-parents working in Turkey. Quickly getting organized through EBA TV (national educational support and ICT source TV) and eba.gov.tr,

providing students various/multiple mass media (EBA or online classes through different programs, EBA TV etc.) can be demonstrated as the strengths of the distance education process in Turkey. As its weaknesses, especially internet connection problems, not being able to attend online classes due to the lack of sufficient internet package or technical problems related to the applications, low attendance to online classes and the decrease in motivation over time can be stated. Also there are no EBA TV broadcasts in some school levels or types (pre-school, special education) and online classes are not a substitute for face-to-face education, especially in skill-based lessons and in the education of special education students. In terms of opportunities, it can be assumed that distance education can be beneficial in order not to break away from education and can be a tool that can eliminate the inequality of opportunity in education if the infrastructure is further developed and the contents are enriched. In terms of threats, it is seen that distance education cannot replace face-to-face education, especially in terms of socialization, and it can reduce motivation, and may lead to low attendance especially when the limited information technology knowledge of parents and students is taken into account. If the infrastructure required for distance education is not accessible to everyone, it can be predicted that it may lead to inequality of opportunity in education. Hopefully, there are solutions in literature to address the issues of lack of motivation, or ICT infrastructure or teacher qualification.

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Topics on Law

Contractual Unpredictability in the Context of COVID-19 Pandemic

Mihaela Elvira Patraus & Ionita Maria Ofrim

The new realities require a revitalisation of the legal system to overcome the effects of the COVID-19 pandemic. The current health crisis is, at the same time, a challenge not only for public authorities, but also for the scientific community and legal practitioners, concerned with finding viable solutions for the adaptation of legal institutions. For the legal system, the contract is an essential factor from a theoretical and practical point of view, an indispensable element for the sphere of private law; it is an essential piece of evidence that lawyers will support in the face of new challenges posed by the current pandemic context. In this article we have in view an objective analysis of the contractual contingency, starting from the jurisprudential consecration that was conferred under the previous regulation and until the introduction of this institution in the national legislation with the entry into force of the new Romanian Civil Code in 2011. We intend to present a brief retrospective on the theory of unpredictability and will discuss the regulation found in national law, as well as the existence of this institution in comparative law. In a dynamic social and economic context, it is essential to clarify the relationship between the binding force of contracts and the possibility of invoking unpredictability, in situations where certain changes affecting the contractual balance occur in the performance of obligations. At the same time, as a case study, we will try to answer the question whether this institution finds its applicability in the most debated issue at legal, national and international level in the current period, namely the effects on contractual relations, generated by the COVID-19 pandemic and the measures taken by public authorities to limit the effects of the virus on human health. In the sphere of performance of contractual relations, in progress at the time of the pandemic, a multitude of controversies have been created, regarding the possibility of invoking, as the case may be, force majeure, fortuitous event or unpredictability and in this article we will highlight to what extent the parties have these remedies at hand. Last but not least, the study will highlight the jurisprudential orientation due to the significant changes suffered in the current social and economic context amid the COVID-19 pandemic, respectively if the institution of unpredictability comes to help the contracting parties to save the contracts concluded before the pandemic which have been affected in the context of the measures and restrictions taken by each state.

Keywords: *unpredictability, COVID-19 coronavirus pandemic, contractual relations, force majeure, fortuitous event, rebus sic stantibus, pacta sunt servanda*

Introduction

In the Romanian civil law, the will of the contracting parties is placed at the center of contractual operations. However, the direct intervention of the legislator and increasingly of the judge in contracts, in the name of public order and in order

to reconcile the interests of the contracting parties to ensure contractual balance, is now manifest and necessary in order to meet the requirements of commutative justice. In addition, political and economic change may give rise to new grounds for both the legislator and the judge to call into question those contractual legal relationships directly affected by these external events that cause harm and insecurity to at least one party, if not both.

Unpredictability as a legal institution, is not entirely new in the Romanian civil law, it has its roots in the Romanian legal tradition, where it was shown that *conventio omnis intelligitur rebus sic stantibus*, an expression that meant that all conventions are considered valid if the circumstances in which have been concluded remain unchanged.

As specific objectives, we formulate the following:

- to analyse from a systemic point of view this mechanism made available to the parties, in order to understand the context in which it appeared, how it developed in the Romanian legal system with the entry into force of the new Civil Code and its express regulation;
- to identify and compare the regulation of this institution in the legislation of France, Germany, England, Italy and Greece, in order to understand the commonalities and differences that exist in the approach of other legislations;
- to present the manner in which the courts have applied this mechanism and how they have intervened in the conventions of the parties in order to safeguard them;
- to point out the most topical discussion, namely the extent to which unpredictability can help the contracting parties affected by the pandemic declared by the World Health Organisation.

Literature Review

Brief History of the Theory of Unpredictability

Before moving on to the analysis of contractual unpredictability, as regulated in the new Civil Code, we consider it useful to make a historical foray to see how this institution has been viewed over time, having as a starting point even the Roman law.

From a historical perspective, the theory as such was not enshrined in a general way in the Roman law, but only through a series of interpretative directives, applicable in concrete cases, and the source of the theory of Unpredictability was identified as being in the next passage in Africanus, identified in *Solutionibus et liberationibus*, (*Digest*, XLVI, 3, fr. 38): „*Tacite enim haec stipulatio videtur sit in eadem causam maneat*”, from which emerges the idea of the existence in the contract of a tacit, implied clauses of termination of the contract, in the event of a change of circumstances (Bradin 2018).

References that can be associated with the theory of unpredictability can also be found in the works of the jurists Paul, Marcellus or in Justinian's Digest. The relationship between Unpredictability and the obligation of contracts is also found in the works of the Roman philosophers Seneca and Cicero, who conditioned the observance of the promises by maintaining the circumstances as unchanged (Zamşa 2006, p. 6).

Canon law offered a more evolved perspective on the obligation of the contract, starting from the principles of the laws of equity and charity, thus introducing the idea of commutative justice, operating a non-existent distinction in the Roman law between just and legal: the just is the rule of conduct imposed by a fair conscience, and the legal results from the provisions of public authority.

The most important representative of the canonists, St. Thomas Aquinas is the forerunner of admitting the theory of unpredictability by implying in the contract of a clause, *rebus sic stantibus*¹, (“Contractus qui habent tractum succesivum et dependentiam de futuro rebus sic stantibus intelliguntur”). In other words, this implied clause suggests some stability of the conditions taken into account when concluding the contract. The first codification that explicitly recognised the existence in contracts of the *rebus sic stantibus* clause, with the consequence of the possibility to request partial execution or adaptation of the contract, was the Codex Maximilianus Bavaricus Civilis enacted in 1756 by the Duke of Bavaria, Maximilian III Joseph, and which was in force until 1900.

In old French law, doctrine and jurisprudence ignored the issue of Unpredictability, as the legislator did not make any mention of the theory of contractual Unpredictability, but only of the principle of autonomy of will. In this regard, the French literature cited, as a classic example, the so-called *Craponne Canal Affair*, concerning the conclusion of some conventions in 1650 and 1567 on charges for irrigation owed by the owners of an irrigation canal, built by an enterprise, to the latter, on which occasion a sum of 3 saus (*or* = old French coin . its need due to the decrease in the real value of the currency and the increase in the price of labor. The Court of Cassation of France, by Decision of 6 March 1876, dismissed the action and declared the intangible nature of the contract by virtue of its binding force.

In view of this decision, both the French and Romanian jurisprudence, in accordance with the first, repudiated the idea of redistributing the obligations arising from a contract, in the absence of an agreement of the parties in this regard, for a long time. However, the dynamism of economic and social realities has led to a weakening of this jurisprudential reluctance and the imposition of new mechanisms for adapting contractual relations, over time. Given the evolutions of some factors that cannot be foreshadowed by the parties at the time of conclusion of the contract, keeping it in its original form could be deeply unfair. However, the issue of monetary devaluation and its negative effects has been strikingly brought to the attention of jurists, the perpetuation of wartime economic instability and inflation forced doctrine and jurisprudence to explicitly address the foundations of the theory, even if it was not legislatively referred to (Burzo 1998, p. 67).

¹“The contracts with successive execution and which depend on the future presuppose that the circumstances remain unchanged (t.n)”.

The vision in the Romanian law on this theory began to take shape with the admission of *Lascăr Catargiu's action against Bercovici Bank*. Therefore, the first case of admission of Unpredictability circumstances at national level, settled by the Ilfov Court, Commercial Section I, by judgment of 11 May 1920, marked a huge step towards accepting that, under pressure from the economic environment, circumstances existing at the time of the execution of the conventions. The impossibility of amending a contract concluded on the basis of objective data existing at the time of the conclusion of the contract would mean giving absolute value to circumstances which, by their nature, are characterised by dynamism (Togan 2017, p. 4).

Relevant is one of the considerations of the judgment, which stated that:

“if [...] totally exceptional events intervened and which changed the situation up to that point, causing the balance to be broken by the creation of excessive advantages on the one hand, or ruinous losses on the other, and if those events could not be foreseen on the date when the convention was concluded, it is fair for the parties to be exonerated of their obligations”.

It is noted that that decision opened the possibility of modifying the contractual relationship, based on equity considerations.

It is interesting to note the relationship between the principle of binding force and the theory of unpredictability over a century: from 1920 - the admission of the theory of unpredictability- until 2011 - when it was enshrined as a real exception to the principle of binding force in the new Civil Code².

In 2011, the game of mutual influence and contradiction between doctrine and jurisprudence ended by regulating, as a real exception to the principle of binding force, the unpredictability, the seat of the matter being included in art. 1271 et seq. Civil Code.

The unpredictability has become a topical issue with its regulation in art. 1271 of the Civil Code, since, until then, the contract seemed to be the law of the parties. Until then, on the old Civil Code, although there was no express regulation of unpredictability, the doctrine and jurisprudence accepted its existence, starting from the provisions of art. 970 of the old Civil Code, *conventions must be executed in good faith, they oblige not only to what is expressed in themselves, but to all consequences, what fairness, custom or law gives the obligation by its nature*, good faith and fairness being the starting point for mitigating the principle of binding force of the contract from art. 969 of the old Civil Code. At the same time, a series of special legal provisions were adopted through which special unpredictability hypotheses were regulated, with limited applicability to the respective fields³.

²Regarding the period after 1989 and until the adoption of the New Civil Code, an attempt was made to mitigate the rule of compulsory contracts. Although the theory of imprevision was rejected, the possibility of readjusting contracts through the freely expressed agreement of the contracting parties was legally enshrined.

³See, for example, Law no. 8/1996 on copyright and related rights; Government Ordinance no. 42/1997 regarding the naval transport; Law no. 195/2001 on volunteering; Government Ordinance no. 5/2001 regarding the order of payment procedure.

Good faith was also central to the judgment of the Quebec Court of Appeal, delivered on 1 August 2016 in the Case *Churchill Falls (Labrador) Corp. v. Hydro-Québec*, 2018 SCC 46, maintained in 2018 by the Supreme Court of Canada, which examines the possibility of applying the unpredictability and adapting the contract in the absence of a text of law that expressly enshrines it, based on the principle of good faith. The reasoning identified in this decision seems to be similar to that set out by the Constitutional Court in Decision no. 623/2016 regarding the exceptions of unconstitutionality of Law no. 77/2016 on the payment of real estate in order to settle the obligations assumed through loans, as well as the Decision of the Constitutional Court no. 15/2017 regarding the exception of unconstitutionality of the provisions of art. 3, art. 8, art. 10 and art. 11 of Law 77/2016, by which the constitutional contentious court placed the institution of unpredictability and under the rule of the old Civil Code, apparently bypassing the rules of application in time of the civil law from art. 6 of the new Civil Code⁴ and from art. 107 of Law 71/2011 for the implementation of the new Civil Code⁵, showing only that this mechanism was applicable under the old Civil Code, in a similar form.

Renouncing the Francophone legal tradition, the Romanian legislator expressly regulated the unpredictability as an exception to the principle of the binding force of the contract in art. 1,271 para. (2) Civil Code. The source of inspiration in this matter is represented by the vision of the German legislation and doctrine on the possibility of admitting the judicial review of contracts for unpredictability, as well as by the international model of uniform regulation of unpredictability provided by UNIDROIT⁶, The Principles of European Contract Law⁷, Common frame of reference for European contract law. The conditions provided in art. 1,271 para. (2) - (3) are proof of the acquisition by the national legislator of this internationally promoted guideline on the existence of the contract (Seperiusi-Vlad 2020, p. 49).

Provisions of Domestic Law

The name “theory of unpredictability”, under which this theory is known today in national law, was borrowed from French doctrine where the effects of changing circumstances were analysed under the title “la théorie de l’imprévision”, probably to emphasise the key element, due to changing circumstances and breaking the contractual balance: the occurrence of an unpredictable event.

⁴According to which “The provisions of the new law apply to all acts and deeds concluded or, as the case may be, produced or committed after its entry into force, as well as legal situations arising after its entry into force”.

⁵According to which “The provisions of art. 1271 of the Civil Code regarding imprevision applies only to contracts concluded after the entry into force of the Civil Code”.

⁶Art. 6.2.1-6.2.3 of the UNIDROIT Principles provided for the revision or renegotiation obligation based on a hardship clause implied in all contracts in which the hardship hypothesis was not excluded.

⁷The principles of the European contract law are a set of rules created by reputable legal specialists from European Union countries under the auspices of the Commission on European Contract Law (The Lando-Commission) and aim to standardise the European contract. See <http://www.jus.uio.no/lm/eu.contract.principles.parts.1.to.3.2002/6.111.html> for art. 6.111.

The binding force of the contract, a principle also known as *pacta sunt servanda*, as a fundamental principle that governs its effects between the parties, imposes on them the obligation to strictly perform the duties they have assumed, justified by the need to ensure stability and security in itself, as well as for reasons of justice and fairness between these parties. To demand full compliance with the contractual provisions in conditions of economic stability is absolutely natural and any deviation from them would harm the community in general. But to claim the same if unexpected circumstances overturn or distort the parties' expectations at the time of the conclusion of their contract and result in a clear disproportion of the benefits they owe, has the same negative effect on the community and the sense of justice in general.

Although the *pacta sunt servanda* and *rebus sic stantibus* principles are seemingly antagonistic, they complement each other, the latter operating as an exception to the first, with the common goal of ensuring the legal security of contracts (Ungureanu 2015, p. 49).

Contracts with successive execution and contracts affected by a suspensive term of execution are exposed, during their existence, to random circumstances whose origins are in the economic situation and, especially, in monetary fluctuations (depreciation of the purchasing power of money). When a contract is concluded, especially during periods of relative monetary stability, the contracting parties shall assume obligations in view of the circumstances or economic realities of the time. But, if, after the conclusion of the contract and before its execution, unforeseen events occur (war, crises, revolution, etc.), serious imbalances may occur between the value of the parties' benefits. The COVID-19 pandemic, the global health crisis that has paralysed the development of trade relations and contractual relations, has recently been included in the category of these unforeseen events, putting the parties in an impossible situation.

In the face of the chronicity of the evil called inflation, respectively monetary depreciation⁸, the strict application of the principle of binding force of the contract revealed a risk of ruin for one of its parties and a cause of enrichment for the other.

In the absence of an express legal definition, unpredictability has been qualified in law as damage suffered by one of the contracting parties as a result of the serious imbalance of value between its services and the other party's consideration during performance of the contract, caused by currency fluctuations or of other circumstances (Pop et al. 2013, p. 153).

Currently, the application of the theory of unpredictability requires the intervention of the judge to restore the broken contractual balance due to unforeseen circumstances of the parties at the conclusion of the contract and unpredictable from the same date, in the absence of express clauses or legal provisions to enable it to review the contract.

The legal norm that we have in mind in our research is included in art. 1271 of the Civil Code, which provides that

⁸The intervention of the *deflation* process, that is the increase of the purchasing power of money, is not excluded either.

“(1) The parties shall be bound to execute their obligations even when such execution has become more onerous, either because of an increase in the execution costs or because of a decrease in the performance value.

(2) However, when the contract execution has become excessively onerous due to an exceptional change in circumstances, which would render the binding of the debtor to fulfill the obligation evidently unjust, the court of law may order: a) the adaptation of the contract in order to equitably distribute between the parties the losses and benefits resulting from the change in circumstances; b) the termination of the contract at the moment and under the conditions established under it.

(3) The provisions of para. (2) shall be applicable only if: a) the change in circumstances occurred after the conclusion of the contract; b) the change in circumstances, as well as their extent, were not and could not have been reasonably considered by the debtor upon contract conclusion; c) the debtor did not undertake the risk of the change in circumstances and they could not have been reasonably considered to have undertaken that risk; d) the debtor tried, within a reasonable period and in good faith, to negotiate the reasonable and equitable adaptation of the contract.”

The text of article 1271 is an exception to the binding force of the contract, provided in art. 1270 of the Civil Code, a text which stipulates that:

“(1) The valid contract concluded has the force of law between the contracting parties.

(2) The contract is modified or terminated only by the agreement of the parties or for reasons authorised by law”

Thus, we can notice that the limitations brought to the principle of *pacta sunt servanda* are essential to ensure the fairness of the contractual relationship in case of factually unfavorable situations for one of the parties. The parties are required to perform their obligations even though the execution has become more onerous, either due to the increase in the execution of their obligation or due to the decrease in the value of the consideration (application of the principle of binding force of the contract), thus highlighting the principle of *monetary nominalism* (Holban and Marțincu 2018, p. 7).

However, art. 1271 of the Civil Code states that not every change in the consistency of the obligation occurred after the conclusion of the contract leads to the possibility of resorting to the mechanism of unpredictability, but the text states that the change must be “exceptional”, meaning it must be of such magnitude that the obligation to become “excessively onerous” (Bârsan 2015, p. 80).

As previously mentioned, the second paragraph of art. 1271 of the Civil Code refers to the “execution of the contract” which has become excessively onerous due to the exceptional change of circumstances, changes which, according to the third paragraph of letter a), *intervened after the conclusion of the contract*. It follows, therefore, that the performance of the contractual obligations must take place either at a certain time after the conclusion of the contract or periodically. Therefore, the unpredictability cannot be applied to contracts with immediate (instantaneous) execution unless they are affected by the modality of the suspensive term or condition. Instead, the preferred category of contracts to which

unpredictability is addressed is that of contracts with successive execution, contracts whose existence is usually long-term.

The specialised literature also expressed the same opinion, showing that the unpredictability may have an impact on certain types of contracts that may be affected by the change of circumstances considered by the parties at the time of their conclusion, such as: (i) synallagmatic contracts, for a fee and successive (long-term) performance, (ii) synallagmatic contracts, for a fee and *uno actu* performance, if the unpredictability situation arises before the performance of the contractual obligations, (iii) certain unilateral contracts, if the unpredictability situation makes the execution of the debtor's obligation excessively onerous for him, (iv) the contracts free of charge, under the conditions of art. 1,006, art. 1,007 and art. 1,008 Civil Code (Sandar 2013, p. 61).

The difficulty in applying the theory of contingency as a basis for the judge's ability to amend a contract lies precisely in the fact that the law uses notions with a certain degree of relativity such as: "more onerous obligation" (when the contract must be performed even in these conditions) and "excessively onerous" respectively (when the contract may be re-established under the *rebus sic stantibus* rule), without providing a clear distinction, which may lead to inconsistent judicial practice. In the literature, it is considered that an obligation can be qualified as excessive, when it is clear that one of the parties would not have contracted if it had foreseen this situation before the conclusion of the contract.

In the event that certain contractual obligations have become excessively onerous, certain conditions must be met for the admissibility of the unpredictability. Article 1271 para. (3) lists these conditions, which must be met cumulatively:

A first condition presupposes that the change of circumstances occurred after the conclusion of the contract, otherwise, if it had already occurred at the date of the conclusion of the contract we are no longer dealing with unpredictability, but with the initial impossibility of execution, which is now subject to a different regulation, contained in art. 1227 of the Civil Code, or even an error, as regulated by art. 1207 Civil Code. The moment of obvious disproportion between the consideration thus has a special role, because it distinguishes between and other legal institutions, such as injury –vice of consent.

The phrase "change of circumstances" has a complex content, as it encompasses in its meaning both the idea of an event and the fact that the event produced a change in the contractual status quo, meaning that the elements taken into account in determining the value. goods or services which are the subject of the contract, elements according to which the parties have established the initial contractual balance. Also, the change of circumstances must be effective and not hypothetical.

The second condition that follows from the provisions of art. 1271 Civil Code implies the need that the change of circumstances, as well as their extent, was not and could not reasonably have been taken into account at the time of the conclusion of the contract. The condition of unpredictability of the change of circumstances results explicitly from the provisions of art. 1271 para (3) letter b) Civil Code, referring to a *reasonable* unpredictability, meaning that to some relative extent, and not absolute, which leads to the essential difference between

unpredictability and force majeure, in which case we discuss about an absolute and insurmountable unpredictability, according to art. 1251 para. (2) Civil Code. Also, if the parties have provided at the time of the conclusion of the contract the possibility to modify the contract and have introduced in the contract either an indexation clause or a hardship clause, the unpredictability can no longer be successfully invoked.

The third condition presupposes that the debtor has not assumed the risk of changing circumstances or is not reasonably considered to have assumed such a risk. This condition is subsequent and complementary to the previous condition, and the legislator understood to emphasise by these two hypotheses in which the unpredictability does not work: in one of them, the debtor has expressly assumed the risk of an unforeseen event and in the second case, the assumption of the risk of the unforeseen event is inferred by way of interpreting the contract.

Another condition implies that the debtor has tried, within a reasonable time and in good faith, to negotiate the reasonable and fair adjustment of the contract. The debtor has the duty to notify the creditor of the occurrence of the unforeseen event and to try on this occasion to negotiate the rebalancing of the contract affected by the unpredictability. Modification of the contract by agreement of the parties is an application of the *mutuus consensus, mutuus dissensus, mutuus consensus, mutuus dissensus* principle, not a result of unpredictability.

As it results from the text of art. 1271 letter d) of the Civil Code, it imposes on the debtor two conditions that must be circumscribed his attempt to negotiate the contract, conditions that must be proved before the court, if the conciliation attempt failed. Thus, the first condition imposed on the debtor is to prove that he tried to negotiate the contract in order to adapt it to the new circumstances imposed by the occurrence of the unpredictability within a reasonable time, which is, in the absence of an express legal provision to determine the minimum or maximum duration, a question of fact which may put the debtor in difficulty if he has to prove to the court his attempt to negotiate the contract within a reasonable time. With regard to the timing of the negotiation of the adjustment of the contract, it was stated that it is necessary that these negotiations should take place as close as possible to the intervention of the contractual imbalance (Lozneau et al. 2012, p. 54).

This condition has raised many questions in judicial practice, from the perspective of its nature as a precondition for notifying the court or a substantive condition for the incidence of unpredictability, and the literature has stated that the provision established by art. 1271 para. (3) Civil Code establishes a mandatory prior procedure for the parties for the conventional review of the contract, before notifying the court, the non-fulfillment of this condition constitutes a fine of inadmissibility if it is formulated in court without fulfilling this preliminary procedure (Ludusan and Puie 2013, p. 24).

In the same sense, it was stated that this condition does not represent a condition of unpredictability, but rather a condition for notifying the court, a preliminary procedure similar to the procedure of direct conciliation in cases and requests in commercial matters, provided by art. 720 ind. 1 of the old Code of Civil Procedure.

Next, we will reproduce some other conditions that are implicit in the analysis of the legal provisions and that have been indicated in the doctrine. Thus, within the provisions of art. 1271 para. (2) Civil Code, which states that the execution of the contract must have become excessively onerous "due to an exceptional change of circumstances" is the condition regarding the exceptional nature of the change of circumstances.

In order to establish the exceptional character of an event, the reporting must not be done *in abstracto*, meaning by reference to generic events such as wars, revolutions, strikes, yet the assessment must aim at a concrete event.

Also regarding the exceptional circumstances that disturb the contractual balance, in the recent literature it has been stated that currency fluctuation does not constitute an unpredictable event from the perspective of applying unpredictability in the case of loan agreements with banking institutions, in the increasingly current context of abusive causes contained in these conventions (Motica and Bradin 2015, p. 546).

Another condition concerns *the transformation of the debtor's obligation into an excessively onerous one*, which clearly results from the content of art. 1271 para. (2). The meaning of the term "onerous" is explained in the first paragraph of the same article, which, referring to obligations that have become "more onerous", states that this happens "either due to increased costs of fulfilling its obligation, either due to the decrease in the value of the consideration".

A last condition debated in the doctrine refers to *the absence of the debtor's fault regarding the change of circumstances or the extent of their effects*. Although this condition does not explicitly result from the content of Article 1271 of the Civil Code, existing doctrinal controversies regarding the necessity or usefulness of retaining such a condition, most of the doctrine considers this issue as necessary to retain the unpredictability.

The effects of unpredictability are regulated by art. 1271 para. (2) of the Civil Code, which stipulates that once the conditions of unpredictability are met,

"if the performance of the contract has become excessively onerous due to an exceptional change of circumstances which would make it manifestly unfair to oblige the debtor to perform the obligation, the court may order the adaptation of the contract in order to distribute equitably between the parties the losses and benefits resulting from the change of circumstances."

The adaptation of the contract involves the direct intervention of the court, so that, by the judgment given, the economic values of the parties' services are modified in order to restore the disturbed contractual balance.

The court may adjust the contract either by acting on the value of the benefits or by amending certain contractual clauses. If the last option of adapting the contract is chosen, the court will have to take into account the fact that, through the correction it will make to the contract, it cannot innovate, meaning that the court is forbidden to rewrite the contract or change its nature by imposing on the parties a new and completely different contract, in which its object has been changed or completely new obligations have been imposed.

Another measure that the court can take if it finds that the conditions of unpredictability are met is to order “the termination of the contract, at the time and under the conditions it establishes”, being a termination with effects for the future.

However, we state that the court will not be able to replace the will of one of the parties that has assumed insufficiently described rights, without deadlines, without delivery obligations, without conditions, but will intervene only in those cases where external factors, whose evolution has not been correctly subject to the agreement of will, radically transforms the amount of rights and obligations of the convention, affecting the initial contractual balance⁹.

When we talk about the judicial review of the contract affected by the unpredictability by reducing the benefits, even if we keep in mind that we are not formally talking about a partial termination, it is impossible not to notice that the legal act “suffers” the same legal fate, being partially abolished on the reason of imbalance in consideration (Lazăr 2016, p. 13).

The current legislation does not offer solutions regarding the possibility of suspending the contract affected by unpredictability, and as noted in the Constitutional Court Decision no. 623/2016, the answer seems to be negative, as the conditions of applicability must be interpreted *stricto sensu* and the same solution would be required in terms of effects.

Elements of Comparative Law

Beyond the borders of domestic law, it is not surprising that we can identify the regulation of an institution similar to the one called unpredictability in our domestic law, because as we have already shown, many states have adopted the theory of unpredictability long before our country.

For example, in the English law, the contractual unpredictability is found under the broader concept of *frustration*, which, beyond the name that suggests the condition of one of the contracting parties when it realises how much the circumstances have changed since the time of concluding the contract, in the English law designates that sphere of impossibility of execution, among which, along with unpredictability, is the force majeure, too (Dumitriu 2013, section 4).

The German law does not regulate a theory perfectly corresponding to the contractual unpredictability in the Romanian law, being a broader concept, similar to that found in the English law, under the name of *Geschäftsgrundlage*, the regulation being found in art. 313 of the German Civil Code of 2000, being a theory of disruption of the contractual basis, respectively that situation occurred in

⁹“If a contract for repair works has not established a deadline for the delivery of the repaired property, any attempt to establish, even by the court, a deadline, can only be made with the defeat the principle of freedom of will of the parties and in violation of the principle of legality. According to this principle, the court is itself obliged to respect the law, and, in this case, the law is given by art. 969 of the Civil Code (art. 1169 NCC), the contract is the law of the parties, and if the parties have not established a term, the court cannot add to the contract of the parties. Therefore, the High Court has ruled that, if no contractual term has been established, it cannot be considered that the work was delivered late and, consequently, no damages can be awarded for this reason”. (Decision no. 373 of February 1, 2012 ruled on appeal by the Second Civil Section of the High Court of Cassation and Justice having as object claims)”.

a totally unforeseen way, which completely destabilises the contractual balance (Zimmermann 2002, p. 2).

The Italian law has a general regulation in art. 1467 and 148 of the Italian Civil Code, the concept being called *eccesiva onerosita* and the remedy implying a termination of the contract that has lost the balance of benefits¹⁰.

In France, until the emergence of the legislative reform in 2016, the principle *pacta sunt servanda* was applied without exception by the courts, which had no legislative basis to apply the doctrinal theory of unpredictability. Starting with October 1, 2016, the unpredictability is regulated by art. 1195 of the French Civil Code, almost identical conditions to those found in our law being provided¹¹.

The Greek civil law provides in art. 388 that the unforeseen change of the circumstances taken into account at the conclusion of the contract may allow the reduction of the debtor's performance or the termination of the contract, being practically an application of the principle of good faith in the contractual relations.

This regulation found in the Greek Civil Code is similar to that of our domestic law, requiring several conditions to be applicable, including the synallagmatic nature of the contract, the unforeseen change in circumstances that the parties considered in the conclusion of the contract, the change of circumstances is due to an exceptional and unforeseen event and this has led to a transformation of the obligation of one of the parties into an excessively onerous one (Ifimie 2015, p. 133).

Unpredictability in the Context of COVID-19 Pandemic

One of the most debated issues at the international level today was the Covid-19 pandemic, especially the legal, economic and social effects of this pandemic. As already mentioned, at the time of concluding a contract, especially in periods of relative monetary stability, the contracting parties undertake in the light of the circumstances or economic realities of the moment. Yet, the economic reality also shows that during the execution of the contract unforeseen events can occur, for example, war, crises, revolution, pandemic, which can generate a series of consequences, such as: shortage of goods, decrease in the purchasing power of money through inflation, exaggerated increase in prices, services and wages. Hence, it is a single step towards the economic chasm to which a party is exposed if serious imbalances can occur between the value of the parties' (Andries 2016, p. 28).

Naturally, the world's attention is currently focused on COVID-19, the disease caused by the SARS-coV-2 coronavirus, which appeared in China at the end of 2019 and has so far spread to over 150 states. The health crisis created by the spread of this virus has caused the disruption of economic activity and destabilisation of legal relations, worldwide being enough victims to make the World Health Organisation, on 11.03.2020, declare that we are in the presence of a pandemic - qualification that has led most states to take measures to prevent the

¹⁰<https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:regio.decreto:1942-03-16;262>.

¹¹The French provision being available at: https://www.trans-lex.org/601101/_/french-civil-code-2016/#head_62.

spread of the virus, which has important legal effects in most areas. The analysis of the nature and legal effects of the pandemic generated by the SARS-CoV-2 coronavirus is a recent and ongoing concern of legal specialists, in order to anticipate potential contractual and/or litigious situations that may arise during the state of emergency or even after its cessation (including by the cessation of some of the effects of the special, derogating legislation, adopted during this period, and, therefore, after the restoration of the domestic legal order).

In order to combat and prevent the spread of the Sars-CoV-2 virus, a state of emergency was ordered throughout Romania (initially, by Decree no. 195/2020, later extended by Decree no. 240/2020), and this exceptional context has led to the gradual application of restrictive measures, which generated a major shock for the national economy and consequences with a significant impact on the economic situation of debtors, individuals or legal entities, whose incomes have decreased considerably.

In the same vein, the restrictive measures established by military ordinances began with banning the movement of individuals, closing the country's borders, suspending all trade flights in countries severely affected by the pandemic (with more than 10,000 people confirmed positive with this virus), closing restaurants, cafes, bars and terraces, banning gatherings of more than 3 people (initially, this number being gradually increased), including banning events such as weddings, baptisms, parties, etc.)

Clearly, the impact of the legislative measures and restrictions adopted to limit the spread of the COVID-19 epidemic has affected ongoing contracts, mainly works, services and transport contracts, but not only.

Thus, amid increasingly drastic measures, the issue of how to exonerate civil liability cases has been raised, given the risks currently present, mainly determined by the following factors: restrictions imposed by the Government; lack of employees, determined by isolation/quarantine; interruptions/delays in the execution of contractual obligations.

Methodology/Material and Methods

Notions such as force majeure, fortuitous event and unpredictability are already discussed in ongoing contracts. The answer to the question whether the COVID-19 pandemic and the establishment of the state of emergency automatically fall under one of the three notions mentioned above, is not a valid general answer, each situation having to be analysed in the light of its particularities. Moreover, in the context of this exceptional situation, *one-size-fits-all* approaches must be viewed with caution, given the different limitations and legal consequences that each situation entails (Strambei 2020, p. 11).

As it results from the conditions already analysed, the unpredictability is not to be mistaken for force majeure or fortuitous case, as exonerating causes of liability. The unpredictability is not to be mistaken for an impossibility of performance, but it concerns the situation in which the fulfillment of the contractual obligations is

still possible, but it has become excessively onerous in relation to the counterparty's consideration.

There are multiple situations in which the spread of the pandemic will have the effect of force majeure or fortuitous event, in that it has made the execution of the contract objectively impossible. Moreover, the public authorities have already instituted measures to block the activity of certain categories of professionals, coming to their aid with measures such as postponing the payment of rent and utilities, under the conditions of art. X of the E.G.O. no. 29/2020¹². However, these measures are not generally applicable, as economic market actors have not been uniformly affected in E.G.O. no 29/2020 (Şeulean 2020, p. 2).

As we have already shown, in order to highlight its basis and purpose, contractual unpredictability must be distinguished from a number of other similar legal figures, such as injury, error, randomness, force majeure, resolutive condition or repair of unforeseeable damage.

For our study, especially for the effect of the pandemic, the greatest interest is the difference between unpredictability and force majeure, this institution which, in terms of its character, is irresistible, invincible and inevitable.

As we have already anticipated, the two institutions have a common character through the sphere of constitutive events, both of unpredictability and force majeure. From here another similarity can be emphasised, which concerns the unpredictability of these situations. The unpredictability of force majeure is such as to remove the debtor's liability only if he was unable to objectively foresee both the occurrence of the event and the adverse effects which it caused. In the case of unpredictability, the feature of unpredictability which gives rise to a serious disturbance of the contractual balance is essential.

Another similarity is provided by the effect on the contractual liability of the party affected by the intervention of the event which determines the removal of liability, the contractual obligation will no longer be performed in the agreed terms.

Finally, exposed to a case of unpredictability or force majeure, the parties are obliged to negotiate, as a form of the obligation of cooperation that must exist between them during the performance of the contract.

¹²Emergency Ordinance no. 29 of March 18, 2020 on some economic and fiscal-budgetary measures Art. X (2) *By derogation from other legal provisions, in the ongoing contracts, other than those provided in para. (1), concluded by the small or medium enterprises provided in para. (1), force majeure may be invoked against them only after the attempt, proven by documents communicated between the parties by any means, including by electronic means, to renegotiate the contract, to adapt their clauses taking into account the exceptional conditions generated by the state of emergency. (3) It is presumed to constitute a case of force majeure, in the sense of the present emergency ordinance, the unpredictable, absolutely invincible and inevitable circumstance referred to in art. 1,351 para. (2) of the Civil Code, resulting from an action of the authorities in applying the measures imposed by the prevention and control of the pandemic caused by COVID-19 coronavirus infection, which affected the activity of small and medium enterprises, damage attested by the emergency certificate. The presumption may be rebutted by the interested party by any means of proof. The unpredictability is related to the birth of the affected legal relationship. The measures taken by the authorities in accordance with the normative act that established the state of emergency will not be unpredictable.*

As can be seen from the definition given by the Civil Code to force majeure, it is specific to its absolutely invincible and inevitable character, which highlights the extent of the prejudicial event that occurred unexpectedly. Therefore, in the case of force majeure, irresistibility and inevitability are two conditions that must be met cumulatively, because even if the event could have been anticipated objectively, its occurrence and its devastating effects generated could not have been avoided, despite the fact that the debtor has taken all necessary measures (Boilă et al. 2012, p. 1492). The doctrine states that in the case of unpredictability, “an irresistibility of a lower degree can be retained, in the sense of the impossibility of removal, of resistance to excessive onerousness or of the drastic diminution of benefits”.

As regards the effects on the contract, the occurrence of an event of force majeure entails the legal impossibility of performance of the obligation assumed. In the case of contractual unpredictability, the affected party is not unable to execute or accept the service, but the excessive burden of the obligation or the drastic decrease of the service to be received occurs.

The different status of incidental remedies is a factor generating a new difference. In the case of force majeure, the remedy for the party exonerated from liability shall take into account the duration and magnitude of the event that occurred - the total or partial termination or suspension of the contract. On the contrary, contractual unpredictability has a specific remedy, to adapt the contract to the new circumstances, in order to preserve it.

Finally, the force majeure is a real exception to the principle of binding force of the contract, while the unpredictability is an apparent exception, which reconfirms this principle and gives substance to the obligation of good faith seen as loyalty in the performance of contracts.

Therefore, in the field of civil law, the pandemic is not, automatically and abstractly, a case of force majeure or a fortuitous event, nor does it entail the *ope legis* application of the unpredictability.

However, given that the COVID-19 pandemic has an undeniable impact on the civilian circuit, affecting the security of ongoing legal relations, the three institutions could be applied, but a case-by-case assessment will be needed to conclude whether and in which to what extent their conditions are applicable to a given situation.

We must not forget that the contractual will of the parties is sovereign and may remove the incidence of cases of force majeure, fortuitous event and, in particular, unpredictability (art. 1351 para. (1) and art. 1271 para. (3) letter c) of the Civil Code), in many matters being such usual contractual clauses to remove the application of the institutions in question. In the conditions of excluding the possibility to invoke them, however, the party which, according to the relevant provisions of the Civil Code could have been exonerated from liability, so which assume the risk of events likely to attract the application of the institutions in question, will be required to fulfill the contractual obligations or repair the damage resulting from their non-performance (Preda 2020, p. 2).

As such, if we are not in a fortuitous impossibility of execution due to force majeure or fortuitous event, but the emergency situation due to the SARS-CoV-2

pandemic can be considered an exceptional change of circumstances in the execution of the benefits of one of the parties, which become excessively onerous compared to the circumstances considered at the date of signing the contract, likely to affect the contractual balance, the party affected by this change could request the court to adapt the contract, pursuant to art. 1271 Civil Code.

Results

Further, it is necessary to pass the pandemic through the filter of the conditions already exposed to retain the incidence of unpredictability. Thus, with regard to the condition that the change of circumstances occurs after the conclusion of the contract, we show that the spread of this virus, together with all measures taken by the states after the official declaration of the pandemic is an exceptional change that can be invoked in concluded contracts and still not executed on the date of the official declaration of the pandemic by the World Health Organisation, respectively 11.03.2020.

Regarding the condition of unpredictability of changing circumstances and their extent at the time of concluding the contract, it is clear that the pandemic is an external and unpredictable event, but some nuances can be made about when this phenomenon of virus spread became known to people in Romania. Thus, although it cannot be stated with certainty that the evolution of the pandemic became predictable with the media coverage of the effects of infection with this virus and the number of people who died in China due to this virus, the same cannot be said about the time of the spread of this virus in Italy, or more, at the time of the declaration of the pandemic by the WHO. Specifically, this condition will not be met in all cases, a verification being made by reference to the time when the parties to the contract knew of the possibility of changing circumstances due to the Sars-CoV-2 virus.

Subject to the condition that the debtor has not assumed the risk of a change in circumstances or is not reasonably considered to have assumed such a risk, we recall that the parties are free to stipulate certain clauses limiting the contractual liability, as well as clauses by eliminating the possibility of invoking unforeseen events in the event of changes. However, given this condition in the current context, it is easy to imagine a contractual clause whereby the parties choose to exclude the incidence of fortuitous event or force majeure (or expressly, the pandemic). For example, several people were surprised to find that in the contracts with the travel agencies for the purchase of holiday packages there were clauses excluding fortuitous events, force majeure and unpredictability in the event of events such as a pandemic, clauses which they did not analyse sufficiently thoughtfully in the given context.

The condition that the debtor has tried, within a reasonable time and in good faith, to negotiate the reasonable and fair adjustment of the contract does not raise issues in this analysis, regarding the debtor's conduct after the pandemic. In this context, we point out that a large part of the contracts affected by the change of circumstances taken into account at the time of their conclusion were renegotiated and/or rebalanced by the parties, following the negotiations, in order to bear fairly

the losses suffered as a result of the changing economic context. For example, in the case of a lease contract with a legal entity, which in turn subleased Airbnb to tourists, the measure restricting the freedom of movement of people outside the country led to the cessation of all reservations made by the tourists on that platform, with the consequence of losing the profit from which the legal person pays the rent established by the contract.

Finally, reviewing the implicit conditions shown above, we appreciate that it is clear that the condition of the exceptional nature of the change of circumstances is met. Thus, the whole of humanity was surprised by the appearance of this pandemic, which is, in itself, an exceptional event, being compared to the Spanish flu that devastated the whole world last century and had tragic effects on those times.

Also, as regards the transformation of the debtor's obligation into an excessively onerous one, the verification of this condition is to be made in each individual case. A common situation is when the debtor's income has been considerably diminished (either due to technical unemployment or dismissal), which prevents him from either paying the bank loan installments, due rent, or continuing previous contractual relationships.

Another common situation concerned the freight transport, in particular cross-border transport contracts. As we have shown, the traffic restrictions were severe, at the border crossing points being established real epidemiological controls, along with the formalities of registration of persons transiting several countries, the purpose of transit and especially the final destination. Adding to all these controls and the fear generated by the possibility of contracting the virus in contact with other people in countries deeply affected by the pandemic (with about 1000 deaths per day), leading to the situation that transport companies did not have drivers available to assume these risks for the same income as before the pandemic, which is why they requested significant salary increases. These additional costs incurred by transport companies have led to the transformation of pre-pandemic obligations into excessively onerous ones.

The situation generated by coronavirus could make many companies objectively unable to fulfill their contractual obligations to their trading partners. In such cases, the non-performance of the obligations could be excused by a situation of force majeure, which usually implies the existence of an objective, unpredictable, invincible and external event. An example would be the obligation to deliver a good in an isolated city, which cannot be entered.

As we have shown on the occasion of the delimitation between force majeure and unpredictability, if for some situations of force majeure, they can justify the non-execution, others could only be in a situation that does not make the execution impossible, but only much more onerous. For example, if the city where the property in question is to be delivered is not isolated and entry into it is not blocked by the authorities, yet fulfilling the delivery obligation becomes much more expensive for the debtor - for example, the usual route used for deliveries is no longer valid, because it passes through blocked cities, and/or has to find other suppliers, because the ordinary one could no longer produce goods, it turns out that such a situation could radically increase the cost for the one who has to deliver

a good. Yet there is nothing in the present case that would prevent the debtor (objectively) from fulfilling his obligation, but would only make it much more difficult for him to comply with his contractual commitments. In such situations, although he cannot use the excuse of force majeure, the debtor could still rely on the unpredictability mechanism to obtain a remedy.

We consider that in the latter hypothesis we can talk about a potential contractual imbalance, which occurred as a result of the pandemic. The parties must negotiate in good faith, a context in which we consider that the disadvantaged party has to prove in concrete terms the excessive burden of its obligation.

Equally, a distinction must be made between unpredictability and fortuitous impossibility of execution, in the light of the premise of each institution. For example, in one case, the Bucharest District 3 Court ruled that from the grammatical interpretation of the provisions of art. 1271 Civil Code, the intervention of the unpredictability can be questioned only in the hypothesis in which the execution of the contract has become excessively onerous, or, in the case brought before the court, the obligation of the defendant to organise a wedding event with 150 people on August 22, 2020 has not become overly onerous, but has become impossible to enforce due to legal restrictions at the time.

Therefore, it is not excluded that the pandemic with COVID-19 is a case of unpredictability, if the conditions previously analysed are met. The mere occurrence of this event, however, does not exempt the party invoking it from the obligation to prove concretely the contractual imbalance encountered, as well as the direct causal link between the occurrence of the pandemic and the situation thus created.

Conclusions

The regulation of unpredictability in the New Civil Code is certainly one of the great challenges brought by the legislator in the civil legislation of Romania. The current regulation appeared in the context of denying the intervention in the contract and evolved towards the possibility of the judge to adapt the contract, in order to rebalance it.

Used as a means of aligning economic and legal realities with the new challenges of the 21st century, the theory of unpredictability is intended to be a viable solution to ensure the completion of as many contracts as possible whose performance is jeopardised by the existence of a major imbalance between the parties, appeared after the conclusion of the contract.

However, adapting the theory of unpredictability of our legal system does not appear to be easy, as the implementation of this theory will overlap with the legal regime of other legal or economic institutions, such as force majeure or credit, for example, a regime that should not be affected.

The current social and economic context has undergone significant changes due to the COVID-19 pandemic, meaning that the institution of unpredictability also comes to help the contracting parties to save the contracts concluded before the pandemic, which were affected in the context of measures and restrictions taken by everyone.

In the matter of execution of the contractual obligations assumed before the declaration of the pandemic and, later, of the state of emergency, there is no generally valid solution, the contractual treatment finds - to a large extent - its solution, in the very clauses of the legal act which ascertains the obligatory relations, corroborated with the factual situation specific to each contracting party, in part. It is essential that we have established that the pandemic and the state of emergency regulated, followed by normative and administrative measures issued by the authorities, fall into the category of cases of force majeure lato sensu and the same causes can be the support, in particular situations, to invoke the fortuitous case by some persons (placed in such circumstances, by the force of the application of restrictive measures by the authorities) or, as the case may be, for invoking the unpredictability.

We believe that it will be a test both for the participants in economic and legal life, as well as for the courts, which will have to rule impartially and professionally when called upon to assess the adaptation of contracts, in the context of ambiguous formulations of the legislator and in the absence of clear criteria for this mission, but especially in the context of the global difficulties posed by the pandemic that hit the world in early 2020.

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Insolvency of the Natural Person and COVID-19 in Romania

Lavinia-Olivia Iancu

Considering that since 2009 draft normative acts have been submitted to the Romanian Parliament, for regulating the insolvency of the natural person, the adoption of the law into 2015 and the entry into force in 2018 represents an indisputable progress but also an entry into normality in the context that all EU member states already had legislation in this area. Three years after the entry into force of the insolvency of the natural law, we can say that the results anticipated by the legislator are far from the reality. The year 2020 characterised by the devastating effects of COVID-19, affected both individuals and legal entities. If the impossibility of overcoming difficult situations by legal entities leads to their deregistration, as far as natural persons are concerned, their disappearance due to the difficulties cannot be taken into account, they must continue their existence with overcoming the situation. Accessing the insolvency procedure of the natural persons is the solution that can be accessed by those in financial difficulty.

Keywords: *insolvency, natural person, COVID-19*

Introduction

In 2014, by the enactment of Law No. 85, the “Insolvency Code” entered into force, which unified the insolvency prevention procedures, the insolvency procedure applicable to all the economic agents as well as the insolvency legislation in relation to the credit institutions, the insurance/reinsurance companies, the corporate groups, and the cross-border insolvency. The “Insolvency Code” name is used in practice in reference to Law No. 85/2014, but such normative act is not a code, in the sense given to this notion by Law No. 24/2000¹, i.e., a systematization and a concentration of the legislation in a certain field or a branch of law subordinated to certain common principles. Obviously, this act is incomplete, due to the absence of legal provisions in the matter of the insolvency of the natural person. The Romanian insolvency legislation is characterised in the recent doctrine (Piperea 2020, p. 501) as being ephemeral, sliding and disseminated into too many normative acts.

Bercea et al. (2014, p. 1023) claim the necessity of a law to regulate the insolvency procedure of the natural persons who do not carry out a business activity, stating that a balanced procedure, devised on the basis of the *win-win* principle, in the application of a payment plan with the discharge of the residual debts on condition of the restitution of a significant percentage of the liability, the debtor would be jointly interested in making the effort of paying a part of the debt knowing that, in the end, he will be exempt from the remaining part, while the creditor would sustain a much smaller loss.

¹Art. 18-19 of Law No. 24/2000 on the legislative technique norms for the drafting of normative acts.

The sole legal provisions that still acknowledged the fact that natural persons as well may have financial difficulties with honoring their assumed obligations are found in art. 1417 of the Civil Code², which states that the debtor loses the benefit of payment by instalments if he is in an insolvency state or, as the case may be, in insolvency declared according to conditions of law and in art. 675 of the Code of Civil Procedure³, where, within the same context of losing the benefit of payment by instalments, reference is made to the “debtor who is in a commonly-known insolvency state”.

The reason for avoiding the adoption of an insolvency code results from the letter of intention issued by the Romanian authorities in September 2012, approved by the International Monetary Fund and ratified by the Government Emergency Ordinance No. 45/2013⁴, where the Romanian state committed not to adopt the Insolvency Law of natural persons with the purpose of maintaining the lending discipline and of avoiding the moral hazard among debtors. Such commitment led to the rejection of three draft proposals in the matter of the insolvency of natural persons.

It was only in 2015 that the Romanian legislator prioritised the necessity of harmonizing the national legislation with the European one and of adopting the Law of insolvency of natural persons No. 151⁵. The law was adopted on the 25th of June 2015 and it should have entered into force within 6 months from the adoption, i.e., on the 25th of December 2015. The 6-month deadline was meant for the performance of the implementation steps required to put it into practice. The law (art. 92) establishes clear implementation deadlines starting from the date of publication in the Official Journal: 60 days for the approval of the methodological norms for the application, 3 months for the establishment of the insolvency commission at a central level and of the insolvency commissions in the territory, 5 months for drafting the lists of members admitted as administrators/liquidators in the natural person insolvency procedure. Since none of these objectives were reached, the deadline for the application of the law was postponed by the G.E.O No. 61/2015⁶ to the 31st of December 2016. The postponement of the entry into force by a year was not enough for the drafting of the methodological norms and the organization of the technical body required for the application of the law, so that by the Government Emergency Ordinance No. 98/2016 published in the

²Law No. 287/2009, republished in the Official Journal No. 505 of the 15th of July, 2011.

³Law No. 134/2010, republished in the Official Journal No. 247 of the 10th of April, 2015.

⁴The Government Emergency Ordinance No. 43/2013 on the ratification of the Letter of Intention signed by the Romanian authorities in Bucharest on the 12th of September 2012, approved by the Decision of the IMF Executive Board of the 28th of September 2012, as well as of the letter signed by the Romanian authorities in Bucharest on the 8th of March 2013, approved by the Decision of the IMF Executive Board on the 15th of March 2013, by means of which Romania was requesting the extension of the Stand-by Agreement between Romania and the International Monetary Fund.

⁵Law No. 151/2015 published in the Official Journal of Romania No. 464 of the 26th of June 2015 and entered into force on the 1st of January 2018.

⁶GEO No. 61/2015 was published in the Official Journal No. 962 of the 24th of December 2015 and it establishes by means of a sole article: the deadline for the entry into force stated in art. 93, the first thesis of Law No. 151/2015 on the natural person insolvency procedure, published in the Official Journal of Romania, Part I, No. 464 of the 26th of June 2015, is extended to the 31st of December 2016.

Official Journal of the 21st of December 2016 - the application of the normative act was postponed again to the 1st of August 2017. By the Government Emergency Ordinance No. 6 of the 27th of July 2017, the deadline for the entry into force was prolonged to the 1st of January 2018. The arduous journey of the entry into force of the law of insolvency for natural persons was completed by the adoption of Law No. 234/2017 when the Government Emergency Ordinance No. 6/2017 for the extension of the deadline for the entry into force of Law No. 115/2015 on the natural person insolvency procedure was adopted.

Finally, Law No. 151/2015 on the natural person insolvency entered into force as late as the 1st of January 2018. The methodological norms⁷ for the application of Law No. 151/2015 on the natural person insolvency entered into force on the 1st of August 2017. The insolvency commissions at the local and central level were established by the Government Decision No. 11/2016.

Landmarks of the Law

Law No. 151/2015 comes to regulate the insolvency of the natural persons whose obligations do not result from the operation of a company. Within such new context, the notion of insolvency acquires a legal definition sanctified by art. 3 point 12 of Law No. 151/2015: “the state of the debtor’s patrimony, which is characterised by insufficiency of pecuniary resources available for the payment of the debts, when they become due. The debtor's insolvency is presumed when, 90 days after the due date, the debtor has not paid his debt to one or more creditors. The presumption is relative.

The notion of over-indebtedness or excessive indebtedness responds to the definition of insolvency that indicates a lack of liquidity for the payment of all the assumed obligations. In a study by the European Commission⁸ it was stated that there is no unanimous definition of the notion of over-indebtedness, such notion being approached differently by the national legislator. Nonetheless, the vast majority of legislations approach the economic dimension, the temporal dimension, the social dimension and the psychological dimension of the phenomenon. The economic standpoint contemplates the amount due, the temporal approach refers to the medium and long-term possibility of payment of the debts, the social dimension comprises the expenses required for everyday life and the psychological standpoint points at the stress of the subject that must cope with the difficult financial situation.

The main purpose of this law is the financial recovery of the natural person debtor, so that the protection of the natural person who is in a difficult financial situation becomes a priority for the legislator. The normative act provides the natural person acting in good faith a series of procedures to be accessed so as to

⁷The methodological norms for the application of Law No. 151/2015 on the natural person insolvency procedure, which were approved by the Government Decision No. 419 of the 9th of June 2017, published in the Official Journal of Romania No. 436 of the 13th of June 2017, entered into force on the 1st of August 2017.

⁸The over-indebtedness of european-households: updated mapping of the situation, nature and causes, effects and initiatives for evaluating its impact http://ec.europa.eu/consumers/financial_services/reference_studies_documents/docs/part_1_synthesis_of_findings_en.pdf.

offer the opportunity to surpass the solvency issues with a view to the social and economic reintegration of such person.

Moreover, the wording chosen by the legislator to define the purpose of the law reveals an imbalance even between the manner of protection of the debtor's interests and his creditors. The debtor appears as a protégé from the economic and social standpoint, while the creditors will recover their claims within the limit of the debtor's possibilities. Such approach is natural within the context where the subject facing financial difficulties is not a legal entity whose failure in business is sanctioned by cancellation from the registry where it is registered. It must be stressed that the natural person will continue its existence after this procedure as well, therefore the very first article establishes the debtor's discharge from debts. A mere debt rescheduling is obviously not satisfying for the insolvent natural person, given that a cancellation, a removal of the debts that are impossible to pay within a reasonable time is necessary.

The financial recovery of the debtor acting in good faith within the context of legal protection of the essential elements of his patrimony for the preservation of a decent living and with the possibility of total or partial debt discharge accounts for the legal framework that gives the insolvent natural person the opportunity of a fresh start.

The chance of a fresh start is conditioned by the good faith of the debtor whose insolvency state must be excusable. It is obvious that the option of accumulating debt with the perspective of non-payment towards the creditors provided for by the Insolvency Law for the natural person may also generate a bad-faith or fraudulent behaviour, which, however, if discovered, is sanctioned by the law by the non-discharge of the residual debts.

The bodies that apply the insolvency procedure are the insolvency commission and the administrator of the procedure, the courts of law and the liquidator.

The efficient application of the law entails the assignment of the human and material resources required within the context of performance of the natural person insolvency procedure. Reaching the principles of such procedure: the debtor's financial recovery, the protection of the creditors' rights and interests, the maximization of the debtor's assets, the expeditiousness, the transparency, the predictability, is ensured by specialised bodies. Although the legislator had bodies already specialised in the matter of insolvency of the professionals, and we refer here to the insolvency practitioners and the syndic judges within the courts of law, the legislator changed such configuration profoundly precisely in order to ensure the debtor's accessibility to the procedure. Moreover, the legislator created a new body in the Romanian legislation - the insolvency commission. The difficulties generated by the allocation of the required human resources, which must also have a high professional standard, are obviously reflected by the subsequent postponements of the entry into force of the insolvency law for natural persons.

An unprecedented fact in the Romanian legislation, the legislator passed special regulations on the insolvency of natural persons - the insolvency commission at a central level and the insolvency commissions at a local level, establishing their attributions.

Whereas the insolvency commission at the central level has the main attributions of monitoring and coordinating the insolvency commissions at the local level, the latter are organised and operate at the level of each county and they have decisional, controlling and supervision attributions within the insolvency procedure.

The local insolvency commission is made up of representatives of the deconcentrated structures within the territory of the National Authority for the consumer protection, the Ministry of Labour, Family, Social Protection and the elderly, as well as one representative of the Ministry of Public Finance.

The establishment of a new body, specific to the insolvency of natural persons encountered a series of difficulties, which led to the postponement of the entry into force of the law until the beginning of 2018. The application of the norms issued by Law No. 151/2015 imposed the establishment of a complex system at the national level, made up of 42 local insolvency commissions, one technical body, logistics as well as the adoption of the application norms for the law. For an efficient operation of such new structure, both human and financial resources had to be allocated. Moreover, the human resources needed a specialization and professional training on the activity they were to carry out.

The Directorship for the Insolvency of Natural Persons within ANPC (National Authority for Consumer Protection) provides the technical body of the central insolvency commission and of the commissions organised at the local level. ANPC is a public institution that operates as a specialty body of the local public administration, with legal personality, subordinated to the Government, which coordinates and accomplishes the Government's strategy and policy in the consumer protection field. Although initially 270 contractual staffing positions were allocated, they were subsequently reduced to 255 and then, radically, to 81, so that currently, the staffing plan only includes 64 positions (Bărbulescu 2020).

Although the efforts made for devising and implementing this new body - the insolvency commission - were consistent, they were hindered by the lack of trust of the Romanian in the provided solutions, aspects that may be quantified in the small number of people who requested to access the natural person insolvency procedure.

Both the procedure administrator and liquidator shall be appointed from among the insolvency practitioners, officers of the court, lawyers and public notaries registered in the List of procedure administrators and liquidators for the natural person insolvency procedure.

The list of procedure administrators and liquidators for the natural person insolvency procedure includes insolvency practitioners, officers of the court, lawyers and public notaries who expressed their intent to perform such activity.

Traditionally, the notion of insolvency was related to the insolvency practitioner who, under the name of trustee or judicial liquidator used to administer the insolvency procedure of professionals. The organization of the insolvency practitioners' activity is regulated by the Emergency Ordinance No. 86/ 2006⁹.

⁹The Emergency Ordinance No. 86 of the 8th of November 2006 on the organization of the insolvency practitioners' activity, published in the Official Journal No. 94 of the 22nd of November 2006.

The admission to the insolvency practitioner profession entails passing an examination, completing a 2-year professional training course and only then sitting the final professional certification examination. Remaining in the profession requires the completion of annual professional training courses.

Within the context of the regulation of the insolvency practitioner profession, it seemed bizarre to allow some other three liberal professions, i.e., officers of the court, public notaries and lawyers, to enrol in the List of procedure administrators and liquidators for the natural person insolvency procedure. Moreover, the norms of regulation of such professions¹⁰ actually contain express interdictions to exercise simultaneously the insolvency practitioner profession. The firm position of the legislator in allowing, by way of exception, several liberal professions to act as administrators or liquidators of the natural person insolvency procedure results from the provisions of art. 12 comma 2 of Law No. 151/2015: “the capacity of insolvency practitioner, officer of the court, lawyer, and notary is compatible with exercising the capacity of procedure administrator or liquidator for the natural person insolvency procedure”. Thus, by means of an article all the interdictions and incompatibilities existing in the various normative acts that regulated the activity of lawyers, public notaries or officers of the court were lifted.

Deleşan (2015, p. 183) also formulated the arguments for which the members of four liberal professions were allowed to become administrators or liquidators in the natural person insolvency procedure. One of the arguments is that for an over-indebted natural person debtor it is more simple and less costly to find support as close as possible, whereas the insolvency practitioners are especially concentrated in the localities where there are county courts, and not in other localities, while the other three professions usually have representation at least in the localities where there are district courts. Another argument is that the insolvency practitioners’ expertise in the professionals’ procedures would be wasted in the administration of natural person procedures, which are more or less professionally challenging, but which are expected to be numerous, therefore repetitive and time and resource-consuming. On the other hand, in regard to the over-indebted natural persons, oftentimes individual forced execution procedures are in progress, initiated by the officers of the court, who, knowing the patrimony situation of the specific debtors, will administer more efficiently the collective procedure. Since such procedure refers to the natural person, and his/her financial difficulties may have various causes (family, loss of job, health issues), the access of lawyers, respectively of notaries was also permitted, to act as administrators/liquidators of the procedure, who may support the debtors to find a solution to their problems. Furthermore, the public registries kept by the notary offices are an important source of information to which the commission must have access, so that the notaries would anyway be involved in the application of this law, and it is therefore legitimate to also grant the capacity of procedure administrator, to the extent to which the representatives of these liberal professions are willing to accept the administration of the procedure. Last but not least, given that the law opens the access to a large number of natural persons to the procedure, it was necessary to have a covering number of

¹⁰Law No. 51/1995 for the organization and exercise of the profession of lawyer, the Law of public notaries and notary activity No. 36/1995, Law No. 188/2000 on the officers of the court.

persons that may have the capacity of administrator/liquidator so as not to prevent the natural person debtors to take advantage of the provisions of the law.

The large number of debtors that would access the procedure in 2015, once with the entry into force of the law, was anticipated by the legislator based on the Report by National Bank of Romania for 2014 where it was stated that as of December 31st the Central Credit Register had a number of 218,000 natural person debtors registered by the credit institutions, the non-bank financial institutions and the payment institutions, with arrears representing 309,000 loans amounting to 33,704 million lei. Faced with such numbers, the Romanian legislator considered that many of these natural persons who have outstanding credits will apply for the natural person insolvency procedure, this being also the reason, in our opinion, why the exercise of the capacity of administrator or liquidator in the natural person insolvency procedure was also permitted to the officers of the court, notaries and lawyers. The intention certainly was to make available to the debtor a considerable number of professionals, easily accessible from a territorial standpoint, who would support, guide and direct the natural person debtor in the insolvency procedure.

The explosion of the natural-person insolvency cases, anticipated by the legislator, did not occur, and 3 years after the entry into force of Law, 25 natural persons are in insolvency, which does not justify the ample system engaged in the performance of the natural-person insolvency procedure.

According to art. 10 of Law No. 151/2015, all the requests and actions in the judicial insolvency procedure by liquidation of assets, the appeals against the insolvency commission decisions and also the debt release requests will fall within the competence of the district court, under the jurisdiction of which the debtor had his/her residence for at least 6 months before referral to the court, without taking into account the subsequent residence changes of the debtor.

Whereas traditionally the court with full competence for the merit trial in the court of first instance in the matter of insolvency was the county court, this time the subject-matter jurisdiction was attributed to the district court.

The arguments used by the legislator to allow the four liberal profession categories to act as administrators, respectively, liquidators of the natural person insolvency procedure also underlie the decision to grant the district court the subject-matter jurisdiction. In addition, it was taken into account that once with the entry into force of Law No. 151/2015, the forced execution requests, which are also under the jurisdiction of the district court, will decrease significantly. The reports¹¹ on the state of justice drafted and published annually by the Superior Council of Magistracy reveal that from 2011 to 2015, over 50% of the cases newly introduced to civil-case judges are constantly related to forced execution. Thus, anticipating the massive access to the natural person insolvency procedure, which entailed the decrease of the number of forced execution cases, fairness was found in attributing the subject-matter jurisdiction to the district court. Yet, the legislator's predictions, as we have shown, did not prove real with respect to accessing the natural person insolvency procedure by the possible beneficiaries. The reports on the state of justice for 2018 and 2019 continue to reveal that over 50% of the cases

¹¹<https://www.csm1909.ro/267/3570/Rapoarte-privind-starea-justi%C5%A3iei>.

newly introduced to civil-case judges are still related to forced execution, aspects deriving from the natural person insolvency procedure not being used.

In the present, noticing the small number of natural persons interested in accessing Law No. 151/2015, we consider that the insolvency procedures might have been attributed to the first instance jurisdiction of the county courts (Nasz 2016, p. 170). We make this claim because the professionals' insolvency matter has a tradition of 26 years and is successfully managed by the syndic judges within the county courts. Moreover, keeping the first instance jurisdiction line within the county court for all the insolvency procedures (professionals and natural persons), would have allowed, on the one hand, the management of the natural person insolvency procedure by judges specialised in the insolvency matter, and, on the other hand, the provision of unitary case law.

The procedures accessible by the natural person debtor are: the administrative insolvency procedure on the basis of a repayment plan, the judicial insolvency procedure through the liquidation of the debtor's assets and the simplified insolvency procedure.

The administrative insolvency procedure on the basis of a repayment plan is defined as the collective and egalitarian insolvency procedure, which is applied to the natural person debtors acting in good faith for their financial recovery, for the adequate management of income and expenses in order to cover as much as possible the liabilities, by means of a debt repayment plan, followed by a release of the residual debts, in accordance with the present law. The central element of this procedure is the debt repayment plan, which must be drafted within 30 days from the communication to the creditors of the final debt table.

The debt repayment plan is the document drawn up by the debtor with the administrator of the procedure, which includes the way in which claims against the debtor's assets are covered, the amounts and the payment deadlines, but not more than the amounts due according to the debt table, as well as any other measures for the financial recovery of the debtor.

The judicial insolvency procedure through liquidation of assets is, pursuant to Article 3(18) of Law No. 151/2015, the collective and egalitarian insolvency procedure, which applies to the natural person debtor acting in good faith, with a view to capitalise the enforceable assets and/or income of the debtor in order to cover the liabilities, followed by the release of residual debts, in accordance with the law. Characteristic of the liquidation procedures is the debtor's loss of the right to dispose of his/her own enforceable assets and income. As results from the very name of such procedure, its essence consists in the liquidation/capitalization of the debtor's enforceable assets so as to cover the creditor's liabilities.

The simplified insolvency procedure is destined to a limited category of debtors. Thus, besides the general requirement for the debtor to be a natural person in an insolvency state and for there not to exist a reasonable probability for the debtor to become, within a 12-month period, capable to fulfil his/her obligations, as they were contracted, with the maintenance of a reasonable standard of living for himself/herself and his/her dependants, with the verification of the interdictions imposed by the law to certain categories of debtors to access any insolvency procedure, the legislator requests the fulfilment, cumulatively, of the following

conditions¹²: the total amount of the obligations is at most 10 national minimum wages; the debtor does not have enforceable assets or income; the debtor has passed the standard retirement age or has lost entirely or at least half of the work capacity. Consequently, the recipients of this procedure are the natural persons who are no longer able to work because of old age or other reasons, do not have assets or income, and their debts do not exceed the amount of 23,000 RON (approximately 4600 Euros).

Comşa (2018, p. 87) compared this last procedure with a social assistance measure for certain categories of debtors and, although it is a standalone procedure, having its own triggering conditions, it is not a genuine collective insolvency procedure.

The financial difficulty that the debtor confronted may not be exceeded only by the suspension of the forced executions or of the accessories, or by granting longer payment deadlines, while the essential aspect is the cancellation of a part of the debt for the debtors acting in good faith. Good faith, as we have shown, is a central element of the natural person insolvency procedure, which must characterise the debtor's behaviour before the opening of the procedure, during the procedure and also after the closure of the insolvency procedure so that the debtor may take advantage of the residual debts release.

Insolvency of the Natural Person in the Context of the COVID-19

The crisis caused by the COVID-19 pandemic from 2020 to 2021 is a major shock for citizens both from a financial-economic standpoint and from a social standpoint. The member states adopted a series of measures to enhance the systems' capacity to offer help to the people from the severely-affected sectors.

Even though at an academic level we speak of supporting the "critical sectors of the economy", the protection of jobs and of citizens in general were particularly contemplated.

The economic impact varied from one sector to another and from one company to another. A series of factors were decisive, among which the possibility to adapt to the interruptions within the procurement chain, stock existence, financial reserves and so on. It is no secret that very many small and medium businesses closed temporarily or for good during the pandemic and very many citizens survived on diminished salaries or were even left without a job. Such aspects led to the diminution of the standard of living.

In the study of Chivu and Georgescu (2020, pp. 26–27) it was shown that in Romania there are about 7 million people at risk of poverty or social exclusion, and the COVID-19 pandemic will further increase this number up to 8 million citizens.

Within the context of a profound economic and financial impact on the Romanian citizen, caused by the pandemic, without being able to anticipate in a real manner the quantitative or temporal dimension of the disaster, the natural person insolvency procedure had to appear as a solution.

¹²Art. 65 of the Law.

In June 2018, the National Office of the Trade Registry (ONRC) announced the publishing in the Romanian Insolvency Proceedings Bulletin (BPI) of the first case of insolvency of a natural person whose obligations do not result from the operation of a company. In March 2019, more than one year after the entry into force of the Law, only 13 Romanians had accessed the natural person insolvency procedure (Niculescu 2019). In January 2020 (Bakos 2020), two years from the entry into force of the Law only 25 natural person debtors had chosen to claim the advantages provided by the natural person insolvency law¹³.

The failure to access the procedure is recognised at institutional level; in September 2020 ANPC¹⁴ announced in a press release that it offers gratuitous guidance procedures for the preparation of the insolvency file of the natural persons who have debt repayment delays exceeding 90 days, and that it will identify new tools suitable for the clients acting in good faith resorting to the insolvency procedure.

Three years after the entry into force of the insolvency law, a very small number of natural persons are in insolvency, although the period from 2020 to 2021, characterised by the COVID-19 pandemic, should have brought a significant increase of this number. Even though this epidemic brought along severe financial difficulties for natural persons, and declaring personal bankruptcy would be a solution, still it is not used by the potential recipients.

Analysing the devastating economic effects caused by the COVID-19 pandemic and materialised into a global recession, the World Bank draws attention to the national legislators on the importance of the crediting activity. The specialists stress the transparency of the crediting process, the reduction of the credit costs, waiving confidentiality clauses and urgent legislative reforms that would allow an efficient management of the debts of natural persons and legal entities. Furthermore, the adoption of urgent measures to improve and consolidate the legal framework in the matter of insolvency are considered “critical” (World Bank 2021, p. 18)

The doctrine on the natural person insolvency in Romania is scarce, yet the authors do agree that the first shape drafted by the legislator - Law No. 151/2015 is not an attractive one for debtors, inasmuch as it is complicated, by many rules, imprecise and interpretable notions and that its modification is required so as to transform it into a tool that would be able to provide clear and concrete solutions in order to exceed the state of financial difficulty of the natural person.

¹³BPI does not provide statistics with respect to the number of natural persons for whom the insolvency procedure is currently open, providing only information related to the number of procedural files issued by the courts of law, the insolvency commissions and the procedure administrator/liquidators and published in BPI - the Debtors Section - natural persons having obligations that do not result from the operation of a company. Thus, in 2018, 28 such files were published, in 2019, 40 files were published and in 2020, 28 such files were published.

¹⁴<https://anpc.ro/articol/1495/comunicat-de-presa.html>.

Conclusion

From a medical standpoint, the fight against the COVID-19 virus in Romania seems to be reaching an end, through the vaccination process that is currently in progress, although the doctors warn of possible subsequent waves of infections caused by mutations of the virus.

From a financial-economic standpoint though, we consider that we will only be able to quantify the effects of the pandemic, generated by the fracturing of the balance existing in society, in 2022.

It is certain that the standard of living of the Romanian citizens decreased and a large part of the population is excessively indebted. Among the efforts made to reduce the social and economic effects generated by COVID-19 on the citizens, we must take into account the encouragement to access the natural person insolvency procedure, by means of which the debtors acting in good faith may be exonerated from part of their debts.

Unfortunately, as we have shown, despite the multiple benefits of such procedure, it is not accessed by the over-indebted natural persons. The ambiguous and interpretable legislation along with the large number of documents required in order to access the procedure does not convince the natural persons to resort to such solution.

The Romanian legislator, following the recommendations of the World Bank, must provide a new legal framework for the natural person insolvency procedure. The law will have to convince the potential natural-person recipients of the benefits provided to them, being able to provide a fresh start to any citizen acting in good faith who has reached a financial state of over-indebtedness for reasons not ascribable to the citizen.

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