

Determinants of methadone treatment assignment among heroin addicts on first admission to public treatment centres in Italy

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Abstract

Aims: To identify factors associated with entering any methadone treatment at first admission at an NHS treatment centre in Italy and to investigate determinants of receiving detoxification or maintenance methadone treatments.

Methods: Data were analysed from 565 heroin addicts who entered for the first time one of 90 NHS treatment centres in 12 Italian regions between September 1998 and March 2001. Subjects were interviewed at admission by the centre's staff and followed-up for 18 months. Details on treatments provided were recorded using a standardised form. Random effects logistic regression analysis was applied.

Results: Factors positively associated with any methadone treatment assignment were: being younger than 25 years and using heroin more than twice a day, having been recently incarcerated, and living with a partner. Independent predictors of admission to methadone maintenance were injecting heroin, having sex without a condom in the previous six months, being HIV positive and having been enrolled at a NHS TC where a psychiatrist was present. Using heroin once a day or more and using cocaine were factors associated with enrolment into detoxification treatment. A significant heterogeneity between centres was observed.

Conclusions: Results from this study give an insight into different patient profiles who are enrolled in methadone treatments. The observed heterogeneity between centres indicates the need to develop and implement common guidelines for the access of heroin addicts to substitution treatment.

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1. Introduction

Heroin addiction is associated with considerable social and medical consequences and represents a serious health problem in the young adult population. Drug treatment is widely recognized as an important component of the public health effort to reduce drug use and drug injection and to control the spread of HIV among injecting drug addicts (McCusker et al., 1996; Booth et al., 1996; Hubbard et al., 1988; Metzger et al., 1998; Sisk et al., 1990). Independent of treatment typology, substance abuse treatment has also been found to be effective in improving family relations, physical and psychological health and in reducing criminal activity

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(McLellan et al., 1986; Strain et al., 1991). Many studies have been carried out, mainly after the onset of the HIV epidemic (Mattick et al., 2002; Zule and Desmond, 2000; John et al., 2001; Schütz et al., 1994; Shah et al., 2000), to investigate factors encouraging entry into drug abuse treatment programs, in particular methadone maintenance, to reduce the public health burden of substance abuse. A variety of treatments are available for heroin addiction with a variety of goals, clinical practises and effectiveness. While there is sound evidence of efficacy based on randomised controlled trials and systematic reviews (Coplehorn et al., 1993; Gearing and Schweitzer, 1974; Amato et al., 2002a) for methadone maintenance treatment (MMT), for other treatments the evidence is far from satisfactory (Amato et al., 2002b). Methadone maintenance has been consistently associated with cessation of drug use and lower rate of injection, needle exchange and HIV infection (Mattick et al., 2002; Metzger et al., 1993; Gossop et al., 2003). Enrolment into methadone maintenance is related with a long history of use, prior treatment episodes and living with a partner while entry into methadone detoxification treatments seems closely associated with recent drug use and recent complications of injecting drugs.

Since the 1980s treatment of drug addiction in Italy has been provided mainly on an outpatient basis, within the National Health Service, through a network of treatment centres and agencies run by non-governmental organizations (NGOs). NHS treatment centres offer a broad spectrum of treatment modalities. The 554 treatment centres present in Italy at the time of this study offered the same types of treatments: methadone maintenance (occasionally buprenorphine); detoxification with substitution drugs, especially methadone, naltrexone, therapies with symptomatic and/or antagonist drugs, and various types of psychosocial interventions. The provision of these treatments vary widely from region to region and, even from treatment centre to treatment centre. In 2001, the percentage of clients who entered long term methadone treatment (>6 months) ranged from 10% in Liguria (Ministry of Health, 2002) to 50% in the Lazio region. In the same year, the availability of MMT differed within the Lazio region, ranging from 3.6 to 68.0% (Pasqualini et al., 2002). Moreover, although methadone maintenance at high dosage (ranging from 60 to 100 mg/day) is recommended for reducing illicit opioid use and promoting longer retention in treatment (Faggiano et al., 2003), dosages provided tend to be low and vary greatly between centres.

Therefore, in spite of the overwhelming evidence of efficacy for methadone maintenance treatment, the organisation and regulation of this treatment in Italy vary greatly.

The aims of the present analysis were to identify factors associated with entering any methadone treatment at first admission at an NHS treatment centre and factors associated with receiving detoxification or maintenance methadone treatments.

2. Methods

2.1. Context

This study was part of the VEdE^{TTE} study described in detail elsewhere (Bargagli et al., *in press*). Briefly, 10,454 heroin addicts were enrolled between September 1998 and March 2001 who were: 18 years of age or over, entering treatment at one of 115 NHS treatment centres in 13 Italian regions. At enrolment subjects were defined as “incident cases” ($N=1249$; 12.0%) if they were starting treatment for the first time at a specific TC during the study period; “re-entry cases” ($N=1981$; 18.9%) if they were not in treatment at the beginning of the study but had been treated by the centre in the past, and “prevalent cases” ($N=7224$; 69.1%) if they were already in treatment at the beginning of the study. To enrol patients, a formal written consent was requested. After the consent, a standardised intake questionnaire was administered by a trained interviewer, usually belonging to the centre’s staff. There was a delay between the start of treatment and the administration of the intake questionnaire. Among incident and re-entry cases, the median delay was 19 days, but 42.4% of these patients were interviewed 30 days after the start of treatment.

2.2. Study population

In order to analyse determinants of the first treatment assigned, we included only first time patients to the treatment centre. It does mean that we included patients who could have been previously treated in other treatment centres, but entering for the first time the enrolment centre (incident cases, $N=1249$). As a consequence we excluded all the re-entry cases ($N=1981$) and the prevalent ones ($N=7224$). Furthermore, we excluded the incident cases for whom information was collected more than 30 days after admission ($N=684$; 54.7% of 1249); for these patients information on heroin use before entering treatment have not been considered valid for the present analysis.

According to the previous criteria, the study population included 565 “incident cases” who entered 90 of 115 centres participating in the VEdE^{TTE} study. The rules for treatment admittance in Italy require that a patient can be admitted only to the centre of his/her own area of residence; therefore, people who moved might have already had contact with another treatment centre. For these people information on possible previous treatments was available, and considered as a covariate. Information on typology of previous treatments was not known.

2.3. Data collection

Data collection was performed using research instruments especially designed for the VEdE^{TTE} study: the Intake Questionnaire, administered at the moment of treatment admission, and the Treatment Registra-

tion Form, used to gather detailed information on treatments.

Heroin addicts who agreed to participate in the study were interviewed by a member of the centre's staff at admission. Participants provided socio-demographic information, history of previous treatments, age of first use of heroin, pattern of drug use in the previous 30 days (i.e. route of heroin administration and frequency of heroin use and cocaine use), sexual and injecting practises during the previous six months and lifetime overdose episodes. Socio-demographic variables included gender, age, civil status, living situation, educational level, employment status, legal problems, and history of imprisonment. Data on HIV, HBV and HCV serological status and psychiatric diagnoses other than drug dependence were retrieved from clinical records. We also included in the analysis if a psychiatrist was present or not at admission.

Information on the first treatment was gathered from the Treatment Registration Form, which recorded for each treatment the beginning and ending date, dosages and frequency of administration of drugs, timetable and duration of psychosocial sessions and outcome. In the Treatment Registration Form, methadone maintenance was defined as "methadone therapy at stable doses and varying not more than 20 mg". Methadone detoxification was defined as "methadone therapy at decreasing doses, lasting less than 180 days and aimed to reach a drug free status".

2.4. Statistical analyses

Participants were grouped according to the two main types of first treatment: methadone detoxification or maintenance (first group), and all other pharmacological treatments and psychosocial programs (second group). If methadone was used in conjunction with another pharmacological treatment or psychosocial program, clients were assigned to the methadone group. Heroin users entering any methadone treatment were compared to those starting other treatment typologies, to identify conditions that might influence assignment to substitution therapies. Subsequently, heroin users entering methadone maintenance have been compared to those starting a detoxification treatment, in order to investigate criteria on admission to different substitution approaches.

Logistic regression models were applied for both comparisons. We introduced a random effect in the models to take into account the potential correlation existing among individuals enrolled at the same treatment centre, and to obtain unbiased estimates. Covariates to be entered into logistic regression models were selected through a backward stepwise procedure, with $p < 15$ for the likelihood ratio as the entry criterion and $p > 2$ set as the criterion for removal from the model. Among HIV, HBV, and HCV we only included in the models the first one, because they were highly correlated. Results are reported only for variables entered in the final model.

Potential two-way statistical interactions were assessed between all variables, independently predictive of the outcome in the final models.

Missing observations were excluded from the multivariate analysis. Statistical analyses were performed using SAS version 8.2 and STATA version 8.0 for Windows.

3. Results

Of the 565 heroin addicts who were included in the study, 373 (66.0%) entered methadone treatment as first treatment at admission; of these, 143 (38.3%) were enrolled in maintenance treatments and 230 (61.7%) in detoxification treatments. Psychosocial interventions were associated in about 47% of the 373 methadone treatments. Among heroin addicts that did not enter methadone treatments ($N = 192$), 70% were offered only psychotherapy, psychological support, or counselling while the remaining (30%) received pharmacological therapies with antagonists, symptomatic drugs, or naltrexone. Tables 1 and 2 describe the socio-demographic and drug use characteristics of heroin users according to participation in methadone treatment (both maintenance and detoxification) and in other treatments. In the total sample of heroin users included in this study, the mean age was 28 years, 85% were males, 60% lived alone or with friends, 42% were steadily employed and 10% reported having been incarcerated within the past 12 months. The mean age at first heroin use was 20 years (S.D. 4.7), the mean length of heroin use was 7.6 years (S.D. 6.1), 67% of people enrolled injected heroin and more than 80% used at least daily. Among those using less than daily, 50% use at least seven times per month.

HIV prevalence among recruited heroin addicts was 2%, yet for many patients (56%) the result of the HIV test was not available when treatment began. Most heroin addicts (89.7%) reported at least one episode of lifetime overdose. Four percent of clients had a psychiatric diagnosis other than drug addiction without differences among treatment groups. For a high proportion of subjects this information was not available (29.2%).

More subjects who began any methadone treatment were living with a partner, had been incarcerated within 12 months before the admission and reported a high frequency of use in the past 30 days (Table 1) than heroin users entering other treatments.

More clients entering MMT injected heroin and reported a lower frequency of use than those who started detoxification treatment (Table 2). Tables 3 and 4 show the results of the two multiple logistic regression models identifying correlates of enrolment in any methadone treatment and methadone maintenance. Living with a partner and having been incarcerated proved to be independent predictors for entry into methadone treatments (ORs 3.25, 95% CI: 1.71–6.21 and 3.32, 95% CI: 1.30–8.47, respectively). A statistically significant interaction was observed between age at enrolment in methadone treatment and frequency of heroin use. For heroin addicts

Table 1
 Characteristics of heroin addicts entering treatment

	Any methadone program (<i>N</i> = 373)		Other treatments (<i>N</i> = 192)		Total (<i>N</i> = 565)		<i>p</i> -value**	
	<i>N</i>	Percentage ^a	<i>N</i>	Percentage ^a	<i>N</i>	Percentage ^a		
Gender								
Males	314	84.2	168	87.5	482	85.3	0.29	
Females	59	15.8	24	12.5	83	14.7		
Age at admission								
<25 years	131	35.1	69	35.9	200	35.4	0.08	
25–29 years	92	24.7	62	32.3	154	27.3		
≥30 years	150	40.2	61	31.8	211	37.3		
Civil status								
Single/divorced	273	73.2	155	80.7	428	75.8	0.05	
Married/steady relationship	100	26.8	37	19.3	137	24.2		
Living situation								
Alone/with friends	205	55.6	132	68.8	337	60.1	0.00	
Parents/relatives	41	11.1	18	9.4	59	10.5		
Partner	116	31.4	35	18.2	151	26.9		
Residential treatment centres	1	0.3	5	2.6	6	1.1		
Homeless		6	1.6	2	1.0	8		1.4
Educational level								
≤5 years	58	15.5	30	15.7	88	15.6	0.99	
6–8 years	207	55.5	106	55.5	313	55.5		
>8 years	108	29.0	55	28.8	163	28.9		
Employment status								
Unemployed	116	31.6	68	35.6	184	33.0	0.31	
Occasionally employed	100	27.2	41	21.5	141	25.3		
Steadily employed	151	41.1	82	42.9	233	41.8		
History of imprisonment^b								
No	326	87.4	181	94.3	507	89.7	0.01	
Yes	47	12.6	11	5.7	58	10.3		
Age at first use of heroin								
≤16	74	19.9	24	12.6	98	17.4	0.03	
>16	298	80.1	167	87.4	465	82.6		
Route of administration								
Other	124	33.5	60	31.4	184	32.8	0.62	
Injected	246	66.5	131	68.6	377	67.2		
Frequency of use								
<1/day	63	16.9	42	21.9	105	18.6	0.04	
1–2/day	155	41.6	91	47.4	246	43.5		
>2/day	155	41.6	59	30.7	214	37.9		
Lifetime overdose								
No	39	10.6	18	9.6	57	10.3	0.73	
Yes	330	89.4	169	90.4	499	89.7		
Use of cocaine								
No	246	66.3	129	67.9	375	66.8	0.70	
Yes	125	33.7	61	32.1	186	33.2		
History of lifetime treatment								
No	200	53.6	118	61.5	318	56.3	0.07	
Yes	173	46.4	74	38.5	247	43.7		
Sex without a condom^c								
No	318	86.9	166	90.7	484	88.2	0.19	
Yes	48	13.1	17	9.3	65	11.8		
HIV test								
Negative	142	38.1	95	49.5	237	41.9	0.02	
Positive	10	2.7	2	1.0	12	2.1		
Not available	221	59.2	95	49.5	316	55.9		

Table 1 (Continued)

	Any methadone program (N=373)		Other treatments (N=192)		Total (N=565)		p-value**
	N	Percentage ^a	N	Percentage ^a	N	Percentage ^a	
Other psychiatric diagnoses							
No	236	63.3	139	72.4	375	66.5	0.06
Yes	16	4.3	9	4.7	25	4.4	
Not available	121	32.4	44	22.9	165	29.2	
Psychiatrist at centre							
No	167	44.8	66	34.6	233	41.3	0.02
Yes	206	55.2	125	65.4	331	58.7	

Methodadone program vs. other types of treatment.

^a Valid percent.

^b In the previous 12 months.

^c In the previous 6 months.

** χ^2 -test.

Table 2

Characteristics of heroin addicts entering treatment

	Methadone maintenance (N=143)		Methadone detoxification (N=230)		Total methadone (N=373)		p-value**
	N	Percentage ^a	N	Percentage ^a	N	Percentage ^a	
Gender							
Males	125	87.4	189	82.2	314	84.2	0.18
Females	18	12.6	41	17.8	59	15.8	
Age at admission							
<25 years	47	32.9	84	36.5	131	35.1	0.09
25–29 years	29	20.3	63	27.4	92	24.7	
≥30 years	67	46.9	83	36.1	150	40.2	
Civil status							
Single/divorced	102	71.3	171	74.3	273	73.2	0.52
Married/steady relationship	41	28.7	59	25.7	100	26.8	
Living status							
Alone/with friends	82	57.7	123	54.2	205	55.6	0.89
Parents/relatives	16	11.3	25	11.0	41	11.1	
Partner	42	29.6	74	32.6	116	31.4	
Residential treatment centres	0	0.0	1	0.4	1	0.3	
Homeless	2	1.4	4	1.8	6	1.6	
Educational level							
≤5 years	24	16.8	34	14.8	58	15.5	0.22
6–8 years	85	59.4	122	53.0	207	55.5	
>8 years	34	23.8	74	32.2	108	29.0	
Employment status							
Unemployed	47	33.3	69	30.5	116	31.6	0.85
Occasionally employed	37	26.2	63	27.9	100	27.2	
Steadily employed	57	40.4	94	41.6	151	41.1	
History of imprisonment ^b							
No	130	90.9	196	85.2	326	87.4	0.11
Yes	13	9.1	34	14.8	47	12.6	
Age at first use of heroin							
≤16	24	16.8	50	21.8	74	19.9	0.23
>16	119	83.2	179	78.2	298	80.1	
Route of administration							
Other	37	26.2	87	38.0	124	33.5	0.02
Injected	104	73.8	142	62.0	246	66.5	
Frequency of use							
<1/day	37	25.9	26	11.3	63	16.9	0.00
1–2/day	57	39.9	98	42.6	155	41.6	
>2/day	49	34.3	106	46.1	155	41.6	

Table 2 (Continued)

	Methadone maintenance (N = 143)		Methadone detoxification (N = 230)		Total methadone (N = 373)		p-value**
	N	Percentage ^a	N	Percentage ^a	N	Percentage ^a	
Lifetime overdose							
No	13	9.2	26	11.4	39	10.6	0.51
Yes	128	90.8	202	88.6	330	89.4	
Use of cocaine							
No	106	74.6	140	61.1	246	66.3	0.00
Yes	36	25.4	89	38.9	125	33.7	
History of lifetime treatment							
No	76	53.1	124	53.9	200	53.6	0.88
Yes	67	46.9	106	46.1	173	46.4	
Sex without a condom ^c							
No	115	82.1	203	89.8	318	86.9	0.03
Yes	25	17.9	23	10.2	48	13.1	
HIV test							
Negative	61	42.7	81	35.2	142	38.1	0.03
Positive	7	4.9	3	1.3	10	2.7	
Not available	75	52.4	146	63.5	221	59.2	
Other psychiatric diagnoses							
No	91	63.6	145	63.0	236	63.3	0.22
Yes	7	4.9	9	3.9	16	4.3	
Not available	45	31.5	76	33.0	121	32.4	
Psychiatrist at centre							
No	49	34.3	118	51.3	167	44.8	0.00
Yes	94	65.7	112	48.7	206	55.2	

Methadone maintenance programs versus methadone detoxification.

^a Valid percent.

^b In the previous 12 months.

^c In the previous 6 months.

** χ^2 -test.

younger than 25 years the adjusted OR of entering methadone treatments was 2.57 (95% CI: 0.83–8.01) for once or twice a day users and 5.93 (95% CI: 1.78–19.77) for more than twice a day users. No statistically significant associations were found in older age groups for any frequency of use. However, while in the 25–29 age group we did not find any specific trend in the odds ratio estimates, in the oldest age group (≥ 30 years) a decreasing trend for frequency of use was observed, exactly opposite the younger than 25 group. In the multivariate model, injectors were more likely to participate in methadone maintenance than non injecting users (OR 2.55, 95% CI: 1.12–5.76). Having sex without a condom in the prior six months and being HIV positive were also independently associated with entry into MMT (ORs 2.92, 95% CI: 1.07–7.93 and 15.22, 95% CI: 1.04–223.31, respectively) while decreased odds of participation in methadone maintenance were observed for heroin addicts who used cocaine (OR 0.32, 95% CI: 0.14–0.72) and used heroin once a day or more (OR 0.22, 95% CI: 0.10–0.63 and 0.32, 95% CI: 0.11–0.90). The adjusted odds ratio of entering methadone maintenance was 9.00 (95% CI: 2.78–29.11) for heroin addicts enrolled in a treatment centre with a psychiatrist on staff. No statistically significant interactions were found among variables included in the multivariate analysis.

In the logistic models for enrolment in any methadone treatment and methadone maintenance, high intra-class correlation coefficients were observed (0.71, 95% CI: 0.57–0.83; and 0.85, 95% CI: 0.72–0.92, respectively).

4. Discussion

This study identified some of the factors associated with enrolment into any methadone treatment and into methadone maintenance treatment in a sample of heroin addicts recruited at their first admission to treatment centres in Italy.

Factors predicting enrolment into any methadone treatment, versus other pharmacological or psychosocial treatments, seem to distinguish two different populations of heroin addicts: very young patients reporting high-risk addiction and social behaviours (recent arrest and using heroin more than twice a day), and an older, more stable group (living with a partner). The subsequent analysis showed that, as expected, heroin addicts with poorer health conditions and high-risk behaviours, such as injecting heroin, having sex without a condom in the previous 6 months, and being HIV positive, are more likely to be assigned to methadone maintenance. This should be taken into account when effectiveness of

Table 3
Factors associated with enrolment in any methadone program: final random effects logistic regression model

Variable ^a	OR	95% CI
Age at admission * frequency of use		
<25		
<1/day	1	
1–2/day	2.57	0.83–8.01
>2/day	5.93	1.78–19.77
25–29		
<1/day	0.90	0.22–3.65
1–2/day	1.00	0.31–3.22
>2/day	1.72	0.49–6.07
≥30		
<1/day	3.77	0.97–14.6
1–2/day	2.39	0.71–7.99
>2/day	1.70	0.51–5.65
Living situation		
Alone/with friends	1	
Parents/relatives	1.81	0.79–4.19
Partner	3.25	1.71–6.21
Residential TCs	0.13	0.01–1.98
Homeless	1.56	0.21–11.5
History of imprisonment ^b		
No	1	
Yes	3.32	1.30–8.47
ρ^*	0.71	0.57–0.83

^a Other variables included in the model: gender, employment status, age at first heroin use, HIV test, history of treatment, presence of a psychiatrist at centre.

^b In the previous 12 months.

* Likelihood ratio test of $\rho = 0$; $p < 0.001$.

methadone maintenance treatment is evaluated in observational studies.

A high frequency of heroin use, and cocaine use are related to a higher probability of receiving detoxification treatment. This finding was quite surprising, but could be the result of the therapeutic alliance between doctors and poorly motivated patients who ask for methadone detoxification in order to continue injecting heroin.

We also found that patients entering a treatment centre with a psychiatrist on staff are more likely to receive methadone maintenance. No previous studies have investigated the role of treatment centre staff make up. In Italy any type of physician in public treatment centres, can prescribe methadone, but we believe that the presence of a psychiatrist may better support long-term substitution therapy. Most guidelines stress the importance of co-operation between methadone-prescribing doctors and psycho-therapists in order to establish a good relationship with the patient and to enhance retention in treatment. Furthermore, the presence of a psychiatrist in a treatment centre could be a proxy of other centre characteristics, such as more structured and organised services, which provides the support necessary to manage a maintenance approach. In a separate analysis we used the available information on centre characteristics to define a centre profile indicator, which proved to be not associated with treatment choice. However, the information available

Table 4
Factors associated with enrolment in methadone maintenance treatment: final random effects logistic regression model

Variable ^a	OR	95% CI
Route of administration		
Other	1	
Injected	2.55	1.12–5.76
Frequency of use		
<1/day	1	
1–2/day	0.22	0.10–0.63
>2/day	0.32	0.11–0.90
Use of cocaine		
No	1	
Yes	0.32	0.14–0.72
Sex without a condom ^b		
No	1	
Yes	2.92	1.07–7.93
HIV test		
Negative	1	
Positive	15.22	1.04–223.31
Not available	0.94	0.43–2.03
Psychiatrist at centre		
No	1	
Yes	9.00	2.78–29.11
ρ^*	0.85	0.72–0.92

^a Other variables included in the model: gender, age at admission, living status, age at first heroin use, history of prior arrest, history of treatment.

^b In the previous 6 months.

* Likelihood ratio test of $\rho = 0$; $p < 0.001$.

in our dataset was very limited and probably not sufficient to fully describe the therapeutic preferences of the centre personnel. We think that staff's beliefs should be further investigated as possible determinant of treatment assignment. It should also be considered that centres where a psychiatrist is present might select higher risk patients, with poorer psychosocial and medical health and severe substance disorders, more likely to be assigned to maintenance. In fact, the high value of the intra-class correlation coefficient supports the hypothesis of heterogeneity among patients referring to each treatment centre: some of the characteristics associated to treatment assignment could also be interpreted as selection criteria for treatment entry, which work differently according to organizational and structural characteristic of the centre itself. In any case, the effect of a psychiatrist presence on methadone maintenance remains even after adjusting for severity.

We began our study by investigating determinants of methadone assignment without distinguishing detoxification and maintenance. This analysis did not allow for the identification of factors associated to the two different methadone approaches but it helped to reveal the situations in which substitution therapy is assigned at first admissions. Preliminary analysis of the VEdeTTE data (Amato et al., 2002a) showed that methadone detoxification and methadone maintenance treatments are often similar in practice. For example, the me-

dian length of detoxification methadone treatment observed in the VEdeTTE study is 31 days (range 1–517), versus 15 days as described in a Cochrane review (Amato et al., 2004); whereas, the median length of methadone maintenance is 21 weeks with an average dosage of 40 mg (S.D. 19.8 mg), both lower than recommended in the international scientific literature.

Therefore, most patients who were intended for detoxification methadone actually received methadone maintenance (stable doses of methadone over a prolonged period). On the other hand, those intended-to-treat according to a methadone maintenance approach received very low doses, for short periods.

A similar situation was found within the National Treatment Outcome Research Study carried out in the United Kingdom (Gossop et al., 2001). The authors observed that many patients allocated to methadone reduction did not receive reduction treatment as intended, and called for a reappraisal of the goals and procedures of methadone reduction treatment.

Some possible limitations of our study should be taken into account when interpreting results. Firstly, in our study data were derived from a subset of a larger sample of heroin addicts enrolled in a longitudinal large scale study (Bargagli et al., *in press*), which limits the generalizability of our findings. The VEdeTTE cohort was compared to the total number of patients treated in Italy during 2000: there were more incident cases in the overall population than in the study cohort (21.1 and 11.5%; $p < 0.01$). The age at enrolment was significantly different; subjects under 30 made up 41.5% of the cohort, while 43.5% of the total Italian treated population was under 30 ($p < 0.01$). There were more women among incident cases in the VEdeTTE study cohort than among patients treated for the first time among the population (16.3% versus 13.0%). Due to the aim of this study we focused on patients who entered treatment centres for the first time and for whom valid information preceding their entry into treatment was available. There were very few heroin addicts who entered treatment for the first time in Italy in the 2000s. Only 12% of patients enrolled in the VEdeTTE study fall into this category; in addition, even though by protocol the information on patients' characteristics should have been collected at admission, for about 55% of "incident" cases the questionnaire was completed more than 30 days later. Even though the information collected still should have referred to a time period preceding treatment entry, we adopted a more conservative approach to increase the internal validity of the study. However, comparing the 565 subjects included and the 684 excluded from the analysis for age, sex, age at first heroin use, age at first injection, and lifetime overdose we did not observe any important difference between the two groups, with the exception of lifetime overdose (76% of subjects referring life-time overdose among excluded versus 90% among included subjects). Furthermore, our study population includes both clients that have never been treated for heroin use and clients previously treated in another PTC. However,

the two groups are very similar according to demographic and drug-use characteristics and they differ consistently by long-term patients included in the VEdeTTE cohort. Controlling for patients history of treatment did not change the results.

In conclusion, we identified possible factors associated with first treatment assignment among heroin addicts, and found great heterogeneity between centres. Such heterogeneity cannot be explained by patients' variables and should be investigated further; it suggests the need for common admission guidelines for substitution treatment.

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