

## Extent and contributing factors of drug expenditure of injectors in Glasgow

Multi-site city-wide cross-sectional study

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**Background** Recent concern about drug use has focused attention on the illegal income generated by users.

**Aims** To investigate factors associated with drugs expenditure and to estimate the cost of illegal acquisitions used to pay for drugs.

**Method** We collected self-report data from 954 current injectors, interviewed at multiple street, needle/syringe exchange and drug treatment sites throughout Glasgow.

**Results** Injectors' mean weekly drug spending was £324. The mean annual illegal drugs spend was estimated to be £11 000 per injector. We provide a central estimate – £194 million per annum – of the retail value of goods acquired illegally by injectors in Glasgow in order to pay for drugs. Higher drug spends were associated with having been imprisoned more often and with those reporting acquisitive crime, drug dealing and prostitution. Treatment with methadone, among individuals who injected in the previous two months, was associated with a 20% reduction in a typical spend on drugs.

**Conclusions** Treatment effectiveness needs to be measured both in terms of health benefit and in terms of reduction in drugs expenditure and recidivism.

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Obtaining a daily supply of illicit drugs can present a challenge; drugs are sold on the black market at inflated prices which vary with supply and demand. Faced with this difficulty, it is unsurprising that dependent drug users, many of whom have low incomes, are unable to sustain their daily intake of drugs unless their income is supplemented from illegal sources (Dorn *et al*, 1994). Indeed, drug use has been related to crime (Silverman & Spruill, 1977; Hammersley *et al*, 1989), prison experience (Covell *et al*, 1993) and prostitution (Frischer *et al*, 1993a). Recent concern about illicit drug use has focused attention on the income-generating behaviours of drug users (Bretteville-Jensen & Sutton, 1996; Task Force to Review Services for Drug Misusers, 1996; Healey *et al*, 1998b); however, most studies have been conducted on selected groups of drug users either entering drug treatment agencies or prison or attending needle/syringe exchanges. Glasgow has a well recognised and extensively studied drug problem, with an estimated drug-injecting population of 8500 in 1990 (Frischer *et al*, 1993b). Information reported by a large multiple-site sample of injecting drug users (IDUs) in Glasgow provided a unique opportunity to determine the factors associated with their spend on drugs and to derive an estimate of the cost of illegal acquisitions (i.e. from shoplifting, car theft, housebreaking, mugging, fraud and pickpocketing) used to pay for drugs.

### METHOD

#### Recruitment and interview procedure

A series of cross-sectional studies was conducted annually in Glasgow between 1990 and 1994 in order to determine the prevalence of HIV and associated risk behaviours as part of a World Health Organization initiative (WHO Collaborative Study Group,

1993). A sampling strategy was used to recruit individuals from in-treatment and out-of-treatment settings in order to ensure representativeness. In-treatment sites included 20 different drug projects and addiction services which together represented most of the drug treatment capacity in Glasgow. Out-of-treatment sites consisted of numerous settings, including eight needle/syringe exchanges, seven pharmacists, 12 shopping centres and other street locations, and were selected to maximise the likelihood that a proportion of the sample would be injectors who had no contact with drug-user treatment. A motor-caravan was used as a mobile interviewing facility; the questionnaire was administered by one of a team of trained interviewers. Sites were located throughout Glasgow so as to cover the city's entire injecting population. The interview procedure involved the use of a standardised questionnaire designed by the WHO Collaborative Study Group (1993).

#### Subjects

An IDU was defined as someone who had injected drugs in the previous two months. In order to reduce the effect of treatment for drug use on current risk behaviours, respondents recruited from in-treatment sites were only eligible for participation if their current episode of treatment had begun within the previous four weeks.

#### Statistical analyses and outcome measures

The 1993 and 1994 interviews were the first to ask questions about income from legal and illegal sources and about expenditure on drugs; a total of 1024 IDUs were interviewed in these years. Respondents were asked the following: (a) "how much money do you spend on drugs in an average week?"<sup>1</sup>; (b) "how much money do you get from all sources in an average week?"; and (c) "thinking about all the money you had to live on during the past six months, what proportion has come from illegal sources?". IDUs with a total income of more than £7000 in an average week (four cases, all

1. The 1994 interview asked "how much money do you spend on drugs in an average day?"; the response was scaled up to weekly drug expenditure for comparison with 1993 data. The change in recording of drug expenditure was introduced for the 1994 survey because of the difficulty found by respondents in calculating expenditures on a weekly basis.

of whom reported drug dealing as their main source of illegal income) or less than £10 per week (11 cases) were evidently outliers, and were omitted from analysis on the grounds that these values would seriously distort estimates such as mean values. (It has been suggested that drug dealers tend to self-report *revenue* from drug sales rather than net financial profit (Bretteville-Jensen & Sutton, 1996); this may have caused the large values for incomes.) Drug spending data were missing for a further 55 IDUs and so analyses were performed on responses from 954 individuals.

Sample characteristics for these 954 individuals are shown in Table 1. We summarised injectors' weekly drug expenditure and total income as follows. The illegal yield of respondents in an average week is obtained by multiplying the answers to Questions (b) and (c); this product divided by the answer to Question (a) is the estimate of the proportion of drug expenditure obtained illegally. The product of four variables – (i) the mean weekly drug expenditure of respondents, (ii) the estimated proportion of the drug expenditure that was obtained illegally, (iii) the estimated prevalence of injecting drug use in Glasgow (Frischer *et al.*, 1993b) and (iv) a factor to account for periods of abstinence from drug use in a year – provides an estimate of the annual illegal drug expenditure of injectors in Glasgow. A further multiplier is then applied to this figure so as to estimate the *value* of goods acquired illegally in order to pay for drugs.

We were interested in how much injectors spend on drugs in relation to demographic details, drug use intensity, treatment utilisation and crime. Preliminary analyses involved collapsing continuous and ordinal variables into groups according to either examples of categories used in previous studies or empirical examination of the distribution of continuous variables, which yielded a natural cut-off. Mean and median drug expenditures are reported for the key variables, and the Kruskal–Wallis rank sum test was used to compare drug expenditures between groups.

Ordinary least-squares regression was then used to investigate these factors in association with reported spend on drugs. A multiple linear regression model including all key variables is specified. On the basis of the multiple regression analyses, we provide an estimate of the impact of methadone treatment on drug expenditure of individuals who had injected drugs in the

previous two months, while controlling for potential confounders. The response variable ('drug spend in an average week') and 'age first injected drugs' had skewed continuous distributions and were therefore transformed (on a natural logarithm scale, as used in previous studies, such as Healey *et al.* (1998b)) in order to induce normality and to stabilise variances in the regression residuals. Highly skewed continuous data (namely 'number of times imprisoned' and 'frequency of injecting drugs') were categorised for the purpose of the regression analyses in order to reduce the influence of extreme scores. The residuals of the multiple regression model were studied graphically (Armitage & Berry, 1994) – in a normal quantile plot, against the predicted values and against the predictor variables – in order to assess how well the model explains the data (plots available from authors on request). Cook's distance (Cook, 1977) was also calculated in order to detect cases which overly influenced the regression coefficients. All analyses were conducted using the S-PLUS software package (MathSoft, 1997).

## RESULTS

### Sample characteristics

Table 1 shows the characteristics of the 480 and 474 injectors recruited in 1993 and 1994 respectively. Sixty-nine per cent (662/954) were male. The mean age at recruitment was 27 years (s.d.=4.8, range 16–45 years). The mean age of first injecting drugs was 18 years (s.d.=3.9) and the mean length of injecting career was nine years (s.d.=4.6).

The drug most frequently used was heroin; 90% (856/954) of respondents had used it in the six months prior to interview. Most participants (97%, 923/954) reported using more than one drug during the previous six months. Almost half of the participants (48%, 455/952) reported using opiates, benzodiazepines and stimulants in the previous six months, while 37% (352/952) had used opiates and benzodiazepines (but not stimulants), 5% (44/952) had used opiates and stimulants (but not benzodiazepines) and 10% (98/952) had used only opiates in the previous six months (another three had only used either benzodiazepines or stimulants; there were two non-responses).

One-fifth of participants (190/940) had no illegal source of income in the six

months prior to being interviewed. Sixty-nine per cent (514/750) of participants who had an illegal source of income reported that their main source was acquisitive crime, which includes all types of theft.

Fifty-eight per cent (553/954) of respondents had received treatment (including drug-free counselling, residual rehabilitation or maintenance or detoxification with methadone or other drugs) in the previous month. The questionnaire does not ask how long these respondents had been receiving treatment for their drug use; but owing to the nature of the inclusion criteria for individuals recruited from in-treatment settings, at least 44% (246/553) had begun their treatment within the previous month.

### Drug expenditure and proportion from illegal sources

Mean weekly drug expenditure of the 954 injectors was £324 (s.e.=9.6, median £250, range £10–£2660). Mean weekly income from all sources was £422 (s.e.=13.5, median £300). The mean illegal yield of participants was, coincidentally, £324 per week (s.e.=12.5, median £235, range £0–£4000), and the mean percentage of drug expenditure from illegal sources was then estimated to be 71% (s.e.=1.3%), with a median of 93% (inter-quartile range 51–100%).

### Annual cost of illegal acquisitions used to pay for drugs

A recent study of terms of imprisonment in the period 1983–94 in Saughton Prison for 316 male injectors who were in the Edinburgh City Hospital HIV cohort showed that they spent approximately six weeks of each year in prison (Seaman *et al.*, 1998). On the basis of these data and the assumption that half of imprisoned injectors continue to inject inside prison at a reduced frequency of six times per month (Bird *et al.*, 1997), we shall assume that injectors spend four weeks on average not purchasing drugs per annum. Their mean illegal spend on drugs would therefore be (mean weekly drug spend × percentage of drug spend illegal × number of drugs purchasing weeks) £324 × 0.71 × 48 ≈ £11 000 per IDU per annum. Hence, in Glasgow, with an estimated 8500 current IDUs (Frischer *et al.*, 1993b), the amount of illegally acquired money being spent on drugs annually by injectors is estimated at £94 million.

**Table 1** Weekly drugs expenditure and associated factors of 954 injecting drug users in Glasgow

Factors	n (%)	Weekly drug expenditure (£)		Univariate-test: <sup>1</sup> value of P for difference in drug spend between groups	Multiple-regression model of weekly drug spend on natural log scale <sup>2</sup>	
		Median	Mean (s.e.)		Coefficient (s.e.)	P
Study group	954 (100)	250	324 (9.6)		(natural log scale: median £5.52, mean £5.38, s.e.=0.03)	
Year of interview						
1993	480 (50)	225	312 (13.9)	0.03	Baseline	–
1994	474 (50)	280	336 (13.3)	–	0.19 (0.05)	0.0001
Recruitment site						
Needle exchange	347 (36)	210	271 (13.8)	<0.0001	Baseline	–
Street	341 (36)	250	320 (15.8)	–	0.14 (0.06)	0.02
Treatment	266 (28)	350	398 (20.6)	–	0.36 (0.07)	<0.0001
Gender						
Male	662 (69)	250	317 (11.4)	–	Baseline	–
Female	292 (31)	275	339 (18.1)	–	0.13 (0.06)	0.03
Age (years)						
<i>(regression uses continuous data – centred at mean 27.1 years)</i>						
16–20	73 (8)	300	423 (43.6)	0.04	–	–
21–25	374 (39)	245	308 (13.6)	–	–	–
26–30	341 (36)	250	323 (16.3)	–	0.01 (0.01)	– <sup>3</sup>
31–35	116 (12)	280	347 (33.1)	–	–	–
≥36	50 (5)	188	248 (29.3)	–	–	–
Age first injected drugs (years)						
<i>(regression uses continuous data – log scale centred at mean 2.9 years)</i>						
11–15	191 (20)	300	384 (24.8)	<0.0001	–	–
16–18	426 (45)	280	343 (14.9)	–	–	–
19–21	177 (19)	200	285 (18.8)	–	–0.62 (0.15)	<0.0001
22–25	102 (11)	188	253 (23.2)	–	–	–
≥26	58 (6)	175	227 (29.7)	–	–	–
Length of injecting career (years)						
<2	71 (7)	210	260 (29.1)	0.03	–	–
2–5	209 (22)	230	303 (20.3)	–	–	–
6–10	380 (40)	250	319 (13.6)	–	Not included <sup>4</sup>	–
11–15	251 (26)	280	351 (20.1)	–	–	–
≥16	43 (5)	280	409 (72.4)	–	–	–
Treatment received for drug use in last month						
None	401 (42)	250	314 (14.7)	0.0004	Baseline	–
Only methadone	127 (13)	180	271 (26.0)	–	–0.22 (0.08)	0.004
Other therapy <sup>5</sup>	426 (45)	280	348 (14.6)	–	–0.07 (0.06)	– <sup>3</sup>
Number of times in prison for one or more nights since started to inject (26 non-responses)						
Never	126 (14)	115	199 (21.9)	<0.0001	Baseline	–
1–4 times	201 (22)	200	261 (18.0)	–	0.06 (0.08)	– <sup>3</sup>
5–30 times	447 (48)	280	349 (14.4)	–	0.17 (0.08)	0.03
>30 times	154 (16)	383	421 (26.4)	–	0.32 (0.10)	0.0008

(continued)

Table 1 (continued)

Factors	n (%)	Weekly drug expenditure (£)		Univariate-test: <sup>1</sup> value of <i>P</i> for difference in drug spend between groups	Multiple-regression model of weekly drug spend on natural log scale <sup>2</sup>	
		Median	Mean (s.e.)		Coefficient (s.e.)	<i>P</i>
Ever injected inside prison (three non-responses)						
Yes	230 (24)	350	397 (21.1)	<0.000 1	-0.02 (0.06)	– <sup>3</sup>
No	595 (63)	250	321 (11.9)	–	Baseline <sup>6</sup>	–
Never imprisoned	126 (13)	115	199 (21.9)	–		
Main source of illegal income (last six months) (14 non-responses)						
None	190 (20)	70	116 (9.3)	<0.000 1	Baseline	–
Acquisitive crime <sup>7</sup>	514 (55)	280	336 (9.6)	–	1.00 (0.07)	<0.000 1
Drug dealing	108 (11)	300	497 (49.9)	–	1.21 (0.09)	<0.000 1
Prostitution	58 (6)	495	533 (39.3)	–	1.27 (0.12)	<0.000 1
Other	70 (7)	248	354 (39.8)	–	0.91 (0.11)	<0.000 1
Frequency of injecting opiates (last six months)						
Less than daily	257 (27)	140	203 (14.1)	<0.000 1	Baseline	–
1–3 times per day	417 (44)	280	320 (12.8)	–	0.36 (0.06)	<0.000 1
> 3 times per day	280 (29)	350	440 (21.2)	–	0.61 (0.07)	<0.000 1
Frequency of injecting benzodiazepines (last six months) (six non-responses)						
Never	528 (56)	210	299 (12.4)	<0.000 1	Baseline	–
Less than daily	263 (28)	245	320 (19.0)	–	0.01 (0.06)	– <sup>3</sup>
Daily	157 (16)	350	417 (24.9)	–	0.10 (0.07)	– <sup>3</sup>
Frequency of injecting stimulants (last six months) (two non-responses)						
Never	606 (64)	239	292 (10.0)	0.0002	Baseline	–
Less than daily	320 (34)	280	375 (20.6)	–	0.05 (0.05)	– <sup>3</sup>
Daily	26 (3)	385	438 (58.1)	–	0.23 (0.15)	– <sup>3</sup>
Preferred drug						
Heroin	531 (56)	300	368 (13.2)	<0.000 1	Baseline	–
Buprenorphine	107 (11)	140	201 (20.9)	–	-0.38 (0.08)	<0.000 1
Temazepam	54 (6)	237	366 (54.5)	–	-0.15 (0.11)	– <sup>3</sup>
Dihydrocodeine	48 (5)	103	151 (23.5)	–	-0.46 (0.11)	0.000 1
Methadone	31 (3)	105	171 (29.9)	–	-0.72 (0.14)	<0.000 1
Other	183 (19)	245	326 (21.1)	–	-0.23 (0.06)	0.0002

1. Non-parametric test performed: Kruskal–Wallis rank sum test.

2. Intercept value of multivariate regression model is 5.56 with s.e.=0.04. Multiple  $R^2=0.50$ ;  $F=32.1$  ( $P<0.0001$ ).

3. Non-significant result at 5% level.

4. 'Length of injecting career' equals 'age' minus 'age first injected drugs', so only two of the three variables are included in the multiple regression model.

5. Other therapy consists of detoxification ( $n=190$ ) or maintenance ( $n=119$ ) with other drugs, residential rehabilitation ( $n=143$ ) and drug-free counselling ( $n=117$ ); 23% (98/426) of these patients also received methadone treatment during the previous month.

6. Categories 'no' and 'never imprisoned' were merged in multiple regression analyses to assess 'ever injected inside prison' in the same model as 'number of times imprisoned'.

7. Acquisitive crime includes shoplifting, car theft, housebreaking, mugging, fraud and pick-pocketing.

The black-market value of stolen goods is low – between a quarter and a half of the retail value (Dougal, 1999, personal communication). Hence, for an injector whose illegal income is mainly generated through acquisitive crime, an illegal drugs

spend of £11 000 per annum could require the acquisition of goods with a retail value of between £22 000 and £44 000 (central estimate £33 000).

Sixty-nine per cent of respondents with an illegal income reported acquisi-

tive crime as their main source in the previous six months (see Table 1). The extent to which those individuals reporting acquisitive crime as their main source supplement their illegal income in part by non-acquisitive crime cannot be estimated

from this study. A question which directly measures the amount of illegal income associated with acquisitive crime needs to be developed. However, in the absence of such a measure, an indirect estimate of 69% is used here as a proxy for the proportion of illegal drug expenditure obtained from acquisitive crime on any one day. Hence, the annual cost of illegal acquisitions used to pay for drugs among injectors in Glasgow could range from £129 million to £259 million ( $£22\,000 \times 0.69 \times 8500$  to  $£44\,000 \times 0.69 \times 8500$ ), with a central estimate of £194 million ( $£33\,000 \times 0.69 \times 8500$ ).

### Variations in drug expenditure

Table 1 provides summary statistics of weekly drug expenditure in relation to characteristics of the injector group, including demographic details, drug use intensity, treatment utilisation and crime. The mean drug spend was significantly but slightly higher among those interviewed in 1994 (£336) than among those interviewed in 1993 (£312); this could be explained by the change in the subject of the question from weekly expenditure in 1993 to daily expenditure in 1994. Drug expenditure was higher among those recruited at treatment and street settings than among those recruited at needle exchanges. Younger individuals, respondents with longer injecting careers and those commencing injecting drug use at an earlier age tended to have higher expenditures.

Participants who had received only methadone treatment in the previous month had significantly lower drug spends than those who had received no treatment for their drug use. Those imprisoned (overnight or for longer) more times since first injecting drugs and those who had ever injected inside prison had significantly higher drug spends. Those who reported no illegal income in the previous six months had lower drug expenditures (mean £116, *s.e.*=9.3) than those reporting mainly acquisitive crime (mean £336, *s.e.*=9.6), drug dealing (£497, *s.e.*=49.9) or prostitution (£533, *s.e.*=39.3).

Frequency of injecting drugs, whether opiates, benzodiazepines or stimulants, was related to increased drug expenditures. Those who preferred other drugs to heroin particularly buprinorphine, dihydrocodeine or methadone, but not temazepam, had lower drug expenditures.

### Multiple linear regression analyses: factors associated with drug expenditure

Table 1 shows the factors significantly associated with drug expenditure, including year of interview, recruitment setting, gender, age when drugs first injected, receiving only methadone treatment in the previous month, number of times in prison since starting to inject drugs, main source of illegal income (acquisitive crime, drug dealing or prostitution), frequency of injecting opiates and preferred drug. The multiple regression model including these factors was able to explain 50% of the observed variation in drug expenditure on natural log scale. The model was significant, and graphical study of the residuals showed no obvious pattern, suggesting no outlying points or variance heterogeneity, and gave no reason to doubt that the residuals were normally distributed. Multi-collinearity between explanatory variables was not a problem. Examination of Cook's distance showed that no cases exerted undue influence on the regression coefficients.

Adjusting for other significant determinants of drug expenditure, participants who had received only methadone treatment for their drug use in the previous month (owing to the nature of the inclusion criteria, at least 18% (23/127) of these would have begun their methadone treatment during that month) had a mean reduction of 0.22 (*s.e.*=0.08) in the natural logarithm of drugs spend, from 5.56 (the intercept of the multiple regression model) to 5.34 – approximately a 20% reduction in median spend from £260 to £209 in an average week after back-transformation.

## DISCUSSION

### Study design

The income-generating behaviour of drug users is now an important focus of drug policy, particularly in the UK. Drug-related crime causes considerable harm to the non-using population. Previous studies have mostly involved the recruitment of a selected population of drug users either entering drug treatment centres or prison or attending needle/syringe exchange services. The recruitment of the individuals interviewed in this study used a multi-site sampling approach in order to facilitate obtaining a representative sample of drug injectors from every part of the city where injecting was prevalent.

In the period 1990–94, around 500 IDUs were recruited annually by our research team into studies of HIV prevalence, risk behaviours and lifestyle. The team's credibility with Glasgow injectors was therefore well established before questions about illegal income and drug expenditure were introduced in 1993. Findings have been reproducible between years (Taylor, 1993) and corroborated by data generated in other investigations (Gore & Bird, 1995). The validity of these results relies on participating IDUs' self-report data (Brown *et al*, 1992). In particular, biases may exist as a result of respondents under-reporting criminal activity, although studies of the behaviour of drug users have found no significant problems with the accuracy of self-reported criminal histories (Parker *et al*, 1998). Although we are unable to test the validity of the interview data, corroboration by external findings (detailed below) makes the drugs expenditure data from this reputedly difficult-to-access group arresting, and much needed – as the Task Force to Review Services for Drug Misusers (1996) highlighted.

### Self-reported drugs expenditure

Our finding of a mean weekly drug spend by Glasgow injectors of £324 (*s.e.*=9.6) is remarkably close to the average of £307 per week estimated for 466 new service users at the Possilpark Drugs Project in Glasgow in the two years up to December 1992 (Meikle, 1998, personal communication). More recently Edmunds *et al* (1996) estimated drug expenditure at £333 per week for 191 users interviewed in London. Half of the Glasgow injectors interviewed in the present study reported that 93% or more of their drugs spend was from illegal sources; the mean was 71% from illegal sources.

### Cost of illegal acquisitions used to pay for drugs

Our central estimate of the retail value (£194 million per annum) of goods acquired illegally by injectors in Glasgow in order to pay for drugs assumed that 69% of illegal expenditure is financed through acquisitive crime. This assumption contrasts with the results of a study conducted in Oslo which interviewed 900 drug injectors attending needle-exchange services and concluded that theft accounted for 23% of total drugs expenditure, while the corresponding figures for drug dealing



and prostitution were 42% and 21% respectively (Bretteville-Jensen & Sutton, 1996). However, it was also noted by the authors of that report that Oslo opiate users generate a larger proportion of their income through drug sales than do Scottish users, and it was reasoned that differential drug prices or potential profitability of this income source may cause the differences between countries in the relative contribution of dealing activity to drug users' income.

The central retail value estimate of £194 million does not include earnings from crimes such as prostitution or drug dealing. In addition to the above illegal acquisition costs, there are law enforcement and criminal justice costs (Task Force to Review Services for Drug Misusers, 1996), medical costs (Taylor *et al*, 1996) and social costs (Healey, 1998b) of injecting drug use, which were beyond the scope of this analysis but which are as important as the acquisition costs. While our sample is likely to be representative of the injector population in Glasgow, the estimates should not be generalised to the wider drug-taking population of non-injectors.

### Factors associated with reported spend on drugs

Higher weekly drug spends were associated with respondents who had been imprisoned more often and with those reporting acquisitive crime (55% of respondents, 514/940), drug dealing (11%, 108/940) and prostitution (20% of female injectors, 57/288). Starting to inject at an earlier age was associated with higher drug expenditures. Drug expenditure increased significantly with the frequency of injecting opiates and decreased for those who preferred buprenorphine (preferred by 11%, 107/954), dihydrocodeine (5%, 48/954) and methadone (3%, 31/954) by comparison with those preferring heroin (56%, 531/954).

### Impact of methadone treatment on drugs expenditure

After adjustment for the significant factors mentioned above, methadone treatment during the previous month was associated with a 20% reduction in typical drugs spend. This reduction is almost certainly a minimum estimate, because only current injectors – individuals who had injected in the previous two months – were eligible for entry into the study. As a result, persons

### CLINICAL IMPLICATIONS

- Injecting drug users in Glasgow reported a mean drug expenditure of £324 per week, 71% of which was financed illegally.
- Goods worth (at retail value) an estimated £194 million (range £129 million to £258 million) are being acquired illegally by injectors in Glasgow annually in order to pay for drugs.
- Treatment with methadone, among individuals who had injected drugs during the previous two months, was associated with a 20% reduction in typical drugs spend.

### LIMITATIONS

- The results rely on participants' self-report data.
- The saving reported from receiving methadone treatment is almost certainly a minimum estimate, owing to the nature of the eligibility criteria; persons prescribed methadone who were not, or were only infrequently, injecting would not have been included in the study.
- In addition to the illegal acquisition costs, there are law enforcement, criminal justice, medical and social costs of injecting drug use, which we did not consider.

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who had been prescribed methadone and who were not injecting, or were only injecting infrequently, would not have been included. In addition, individuals recruited from in-treatment settings were only eligible to participate if they had begun their current episode of treatment for drug use in the previous four weeks; however, this only applied to 18% of the methadone group, so the majority of this sample were actually recruited outwith in-treatment settings and as such could have been receiving methadone for longer than four weeks.

The Task Force to Review Services for Drug Misusers (1996) regarded the lack of UK research on drug treatment effectiveness as its largest single handicap. It therefore initiated an observational study (the National Treatment Outcome Research Study) and, more pointedly, called for randomised controlled trials of drug treatment

effectiveness (Gore & Seaman, 1996). While we accept that a more rigorous appraisal of methadone treatment effectiveness is required, the regression analysis in this paper, in the current absence of better data, yields a conservative estimate of the impact of this intervention on drug expenditure.

While this study clearly demonstrates a positive relationship between crime and drug expenditure, at an individual level a reduction in drug expenditure may not necessarily lead to a reduction in illegal activity. For some, drug use is simply an extension of a pre-existing deviant lifestyle (Healey, 1998a). For others, the difficulty in generating sufficient income to support desired consumption and a close relationship with the criminal underworld may provoke and encourage criminal behaviour (Jarvis & Parker, 1989; Deschenes *et al*,

1991). Cohort and cross-sectional studies are in progress in Glasgow, aimed at assessing, specifically and comprehensively, the impact of methadone prescribing on key outcomes, including drugs expenditure and illegal sources of income (details available from author on request). Early results suggest that the effect of methadone treatment on drugs expenditure is more dramatic than the 20% reduction that we have posited from this epidemiological study, and that large reductions in acquisitive crime have taken place.

While methadone alone was shown to be associated with a reduction in drug expenditure, we were unable to assess specifically in this study, owing to a lack of numbers and to the inclusion criteria, whether other treatments (e.g. residential rehabilitation or drug-free counselling) are also associated with such reductions. Randomised trials are therefore needed in order to measure treatment effectiveness and the effectiveness of alternative interventions both in terms of health benefit to individuals and in terms of reduction in drugs expenditure and recidivism.

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