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DIVERSION OF METHADONE AND BUPRENORPHINE FROM OPIOID SUBSTITUTION TREATMENT: PATIENTS WHO REGULARLY SELL OR SHARE THEIR MEDICATION

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Diversion—the practice of patients selling or sharing their medication—is a much debated problem of opioid substitution treatment. Regular diversion by patients was studied at 11 opioid substitution treatment programs in the south of Sweden. Using quantitative and qualitative data, it was investigated whether those patients differ from other patients, their motives for and means of diversion, and who the recipients are. Regular diverters are a small, yet heterogeneous group. Continued illicit drug use, however, stands out as a common risk factor. Pecuniary need and a desire to help friends are other important motives. The client base mainly consists of people from the regular diverters' own drug milieus.

KEYWORDS. Methadone, buprenorphine, opioid substitution treatment, diversion, illicit use

INTRODUCTION

This article examines patients in opioid substitution treatment (OST) who regularly sell or share part of their medication to other users who are not in treatment. These "regular diverters" constitute a group almost completely neglected by researchers. The introduction will be started with a brief description of previous research on illicit use of methadone and buprenorphine, and on diversion, before going on to delineating the purpose of this study.

Illicit Use of Methadone and Buprenorphine

Methadone- or buprenorphine-based OST is considered the most effective method for treating heroin addiction. The positive effects on mortality, morbidity, illicit drug use, social functioning, and criminality, are well documented in research.[1–3] However, OST also exhibit potential negative effects when the medication is used illicitly, and without medical supervision. Deaths due to diversion of methadone from OST have been highlighted as a problem in several countries.[4–9] Illicit buprenorphine use has been implicated in a number of deaths as well, in particular poly-intoxication with sedatives and alcohol.[10–13]

Research on diversion and illicit use has been relatively sparse. The illicit use of these substances by problematic drug users has attracted the most attention. Methadone and buprenorphine are both sought after on the illicit market. Studies have shown that illicit methadone is very common among injecting drug users and users with a heroin addiction.[14–19] This is particularly the case among older drug users, people who have previously undergone methadone treatment, and users who have recently gone through detoxification.[17] Illicit methadone is also in demand by OST patients who have failed to collect their treatment doses, or are dissatisfied with their prescribed dose.[20,21] Buprenorphine, too, is a

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prevalent street drug,[22–25] and in some countries, the substance has become the most common opioid on the illicit drug market.[25]

Illicit methadone and buprenorphine is often used for self-medication purposes, by problematic drug users who want to avoid withdrawal symptoms, perform self-detoxification, or prefer to manage substitution treatment on their own.[18,20,24,26] However, the substances can also be used for euphoria-inducing purposes, either on their own or in conjunction with benzodiazepines and other sedatives. Such combinations may boost the effect and yield a heroin-like high.[27,28]

Few studies have investigated the use of methadone and buprenorphine by more inexperienced drug users. However, there is one Swedish study which indicates that these substances tend to enter a user's drug career at a late stage, and that they are extremely rare among adolescents and young adults, unless they have already developed more severe drug problems.[29]

Diversion

Diversion of methadone and buprenorphine occurs in many ways: by physicians and other treatment staff, in transit, in the production, or from wholesalers.[20] Most studies, however, indicate that the primary source of illicit methadone and buprenorphine are patients undergoing OST.[20,30,31] "The methadone street scene" has been described as a market with a different structure than the heroin market.[28] The heroin market is typically controlled by a few major players managing networks of street dealers. The methadone market, on the other hand, consists of numerous actors selling small quantities of their own prescription medication.[28,32] The same setup, in all likelihood, also applies to buprenorphine.

OST programs have been described as "ideal locations offering virtually unfettered access to any variety of medications."[33] This, notwithstanding, research about OST patients who sell or share their medication has, until now, been sporadic and limited.[34] The prevalence of diversion varies considerably in self-reporting studies. The percentage of patients claiming to have sold or shared their medication, at some point, vary between 9.6% and 67.6%,[20,34–36] with a one-year prevalence variation between 4.3% and 23.8%,[35,37,38] and a one-month prevalence between 4.6% and 24.1%.[34,38] How these appreciable variations should be interpreted is not entirely clear. However, in all likelihood they are partly due to genuine differences, and partly a result of specific data acquisition methods (written surveys, brief structured interviews conducted by researchers, and more extensive structured interviews by researchers as well as specially trained patients) yielding contrasting results.[34,38]

Also when it comes to factors increasing the risk of diversion, previous research provides partly inconclusive answers. No connection has been established between individual characteristics (such as age, sex, civil status, or education) and an increased risk of diversion, but social risk factors have been identified in some studies.[20,34,37] Patients with personal experiences of illicit methadone or buprenorphine use are at an increased risk,[34,35,37] as well as patients who have injected their medication while in treatment.[37] Current illicit drug use has also been singled out as a risk factor in a couple of studies.[20,34]

As regards treatment factors, the studies conducted point to buprenorphine posing a greater risk of diversion than methadone.[34,35,37] Dosage levels, however, appear not to have any effect on the risk of diversion, and the results are inconclusive as regards handing-out procedures; some studies point to diversion mainly occurring among patients with a high number of take-home doses, while others indicate that diversion takes place also among patients who take their medication under supervision.[8,20,34,38,39]

Two primary motives for diversion stand out in the studies. Pecuniary need is one—it is not unusual for OST patients to be badly off, and profits from selling medication often constitutes an important addition to the household income. Furthermore, many patients continue to use illicit drugs, and selling part of their medication is a potential way of financing their

habit.[20,32] However, diversion may also have altruistic motives since patients share their dose with partners, friends, or acquaintances, who use them to avoid withdrawal symptoms or for self-medication purposes.[34,38] Other potential motives for diversion are that the prescribed dose is in excess of the patient's own needs, or that a user avoids taking his/her medication in order to get high on heroin.

The various diversion methods have been insufficiently studied. Two general strategies are to acquire more than one prescription (so called "multiple prescription"), or to acquire a higher dose than required for personal use ("overprescription"). This can, for instance, be achieved by the patient exaggerating his/her drug addiction or by negotiating a higher dose with the physician.[40] Patients who take their medication under supervision, on the other hand, need to devise ways and means of smuggling medication out of the clinic, such as exchanging methadone vials, avoiding swallowing liquid methadone,[20] caching away buprenorphine tablets, or preventing the tablets from dissolving in the mouth.[41]

Research Aims

Patients who sell or share their medication on a regular basis constitute a population almost completely neglected by previous research. Although the market for methadone and buprenorphine features numerous providers, such "regular diverters" may be responsible for a relatively large part of the supply.[a] In a previous article, where views on diversion among the staff at eight Swedish OST programs were studied, regular diverters were highlighted as the most problematic group.[42] A number of staff members were of the opinion that this group undermines the legitimacy of the treatment form, and also expressed a concern that they would divert methadone and buprenorphine to inexperienced opioid users. There were, moreover, staff who questioned whether regular diverters deserve to remain in treatment.

Until now, the only scholars to investigate regular diverters were Spunt and colleagues.[20] In 1981 and 1982 they interviewed 368 methadone patients in the Tristate area of the United States. More than one-third, 34%, of the respondents admitted to having diverted methadone at some point. Of these a further 23% (or 10% of all patients) stated that they sold or shared their medication "most of the time." The majority was unemployed, and the proportion who had used illicit drugs (cocaine and heroin) in the week preceding the interview was higher than for other respondents. The reasons given for diversion by the patients included low income, need of money for other drugs, or regularly sharing of their methadone with partners or friends in need.

The aim of this article is to investigate the phenomenon of regular diversion among patients from 11 OST programs in the south of Sweden. The authors investigate whether "regular diverters" differ from other patients, what their motives are for selling or sharing, as well as how and to whom the medication is diverted. They also investigate the potential consequences of diversion for patients, and how they see the control measures in the programs.

METHODS

Definitions

A mixed-methods design was employed where quantitative (structured) interviews are combined with qualitative follow-up interviews. In the quantitative dataset, regular diverters were defined as patients who have sold, exchanged, or given away medication on at least five days in the past month (the average for the group was 13.5 days). In the qualitative dataset, regular diverters were defined as patients who, for an extended period, have been selling, exchanging, or giving away at least one-third of their prescribed dose, without any requirement of this diversion being current. Although the definitions for the two datasets differ, in reality there is a substantial overlap between the populations (this will be discussed further later in text).

Quantitative Data and Analysis

The study is based on a quantitative dataset consisting of 411 structured interviews with

OST patients (219 methadone patients, 112 buprenorphine patients, and 80 buprenorphine-naloxone patients). The interviews took place between May and December 2012 at 11 OST programs in five Swedish towns and cities in the south of Sweden. The inclusion criterion was that the respondents had been admitted to OST for at least four weeks.

Two different data gathering methods were used: on-site interviews conducted by researchers, and peer interviews performed by patients. The on-site interviews ($n = 280$) took place at the OST clinics in each one of the five locations, and were conducted by the project coordinators (Johnson and Richert), and three project assistants. The peer interviews ($n = 131$) took place in the two major cities, in the form of "privileged access interviewing" by nine specially trained patients. These patients have extensive networks in various patient populations. The peer interviews were conducted outside of the programs (at home or in public places, such as cafes and parks). Before the data acquisition began, all interviewers—peer interviewers as well as project assistants—underwent training to familiarize themselves with the interview and its questions, and to practice interview technique.

The interviews were conducted using a questionnaire covering the following topics: demographic information, health, social situation, drug use (past and present), experiences of illicit use of OST medication, healthcare experiences, current OST status and views on the treatment form, attitudes to diversion, and finally, personal experiences of diversion. The questionnaire comprised 106 closed-ended and five open-ended questions, and took approximately 60 minutes to complete.

The authors have performed an analysis of non-participation bias at population level by gathering information about the number of patients, sex, age, type of OST medication, average doses as well as handing-out procedures from the 11 programs at the time of the visits. The total number of patients was 1,006, which means that the 411 interviewees constitute 40.8% of the entire patient population. In the material, patients who collect their medication frequently (5–7 days a week) are slightly over-represented, and there is an underrepresentation of patients who collected their medication more infrequently (less than once a week). In all other respects, there were no significant differences. A more detailed discussion of data acquisition methods, recruitment procedures, and non-participation bias may be found in a previous article from the project.[34]

The quantitative material was analyzed by means of calculations of frequencies and averages, as well as cross tabulations. Statistical significance was analyzed with χ^2 test, Fisher's exact test, and *t*-test. The analyses were performed with the SPSS software, version 20 for Windows.

Qualitative Data and Analysis

In connection with the structured interviews, qualitative follow-up interviews were also conducted with a selection of the patients who claimed to have sold or shared their medication on a large scale or for an extended period. All patients were asked who in their on-site interviews had stated that they had sold or shared their medication on at least five days in the past month ($n = 16$). Of these, ten agreed to take part in a follow-up interview. A smaller number of patients who had reported that they previously had engaged in more extensive diversion activities were also asked. Four people agreed to take part, giving an investigation population of 14 patients in total, 10 male and 4 female. Five patients had a methadone prescription, four buprenorphine, and five buprenorphine-naloxone. Their ages varied between 23 and 53 years. The qualitative interviews were all conducted by the researchers in charge, Johnson and Richert.

A semi-structured interview guide was employed comprising the following topics: (1) how the diversion started, (2) motives for the diversion, (3) who their customers/recipients were, and how they kept in contact with them, (4) the extent of the diversion and the prices of the substances, (5) how the patients acted to amass a surplus to sell or give away, (6) how they viewed the control measures of

the treatment programs, and (7) what repercussions, if any, the diversion had had for them.

Each interview typically lasted about 30 minutes. To encourage the interviewees to be open without having to worry about breaches of professional confidentiality later, no recordings were made. However, brief notes were made, and certain quotes took down verbatim during each interview. Later the same day a case report for each interview was compiled.

The analysis of the case reports were performed as a manual, three-step qualitative textual analysis. Initially, a close reading of the material was made, and performed a summary coding based on the topics of the interview guide. Then a second was made, more detailed coding, where similarities and differences in relation to the original topical subdivision were identified. Finally, the material was gone through one more time in order to identify suitable illustrative and representative quotes.

Ethics

Before the interviews began, all interviewees were informed verbally and in writing about the project and its aims. It was explained that the study was completely confidential, that participation would not affect their individual treatment, and that they had the option of ending the interview at any time. Participants were offered a gift voucher worth SEK 200 (about EUR 22) or a book, regardless of whether they completed the interview or not.

The project was conducted in accordance with The Swedish Ethical Review Act (SFS 2004:460). The design and execution of the project, including the questionnaire, has been approved by the Regional Ethical Review Board at Lund University (ref 2011/763).

RESULTS

Regular Diverters—Who Are They?

In the quantitative material certain group-related differences can be detected between regular diverters (diverted $\geq$5 days in the past month, $n = 35$) and other patients (diverted $<$5 days or not at all during the last month, $n = 376$). Table 1 is a comparison between the populations with reference to individual factors, treatments factor, social factors as well as personal experiences of illicit methadone or buprenorphine use (outside OST).

As regards individual factors there are no statistically significant differences ($p < .05$) between regular diverters and other patients. In terms of working income, however, there is a tendency (Fischer test, $p = .081$) indicating that such incomes are less frequent among regular diverters than among other patients.

Looking at treatment factors, regular diverters have been prescribed mono-buprenorphine or buprenorphine-naloxone more often, while methadone prescriptions are more frequent among other patients (χ^2 test, $p = .007$). There are no differences between the groups in terms of dosage levels, handing-out procedures, treatment duration or previous experiences of OST.

When it comes to current drug use, there is a marked difference between the groups. Regular diverters are more likely to have used illicit drugs—mainly amphetamine, sedatives/depressants, and novel psychoactive substances—in the past month than other patients (χ^2 test, $p = .002$). The trend for cannabis and heroin, respectively, are pointing in the same direction, but in this case the differences are not significant. It is also more common for regular diverters to have used alcohol in the past month (χ^2 test, $p = .003$), and their average monthly alcohol consumption, measured as number of days per months, is higher (t-test, $p < .001$) than for other patients who had used alcohol.

Usage of illicit methadone or buprenorphine outside OST is very common for all patients, without any significant differences between the groups. Regular diverters, however, are more likely than other patients to have bought or received methadone (χ^2 test, $p = .006$) and buprenorphine (χ^2 test, $p = .004$) from patients in OST in particular, than from other sources (dealers, healthcare staff, analgesic patients, the internet, or from abroad).

TABLE 1. Regular Diverters Versus Other Patients: Individual Factors, Treatment Factors, Current Drug Use and Experiences of Illicit Use

Variables	Regular Diverters ($n = 35$)	Other Patients ($n = 376$)	p-Values
Individual factors			
Age (average)	37.5 (35)	39.5 (376)	.208 (b)
Sex (male)	65.7% (23)	75.5% (284)	.201
Native country (Sweden)	91.4% (32)	80.1% (301)	.101
Civil status (married/live-in partner)	45.7% (16)	30.6% (115)	.066
Children	31.4% (11)	42.0% (158)	.223
Education, >grade school	45.7% (16)	53.2% (200)	.397
Stable housing	74.3% (26)	66.2% (249)	.332
Working income	8.6% (3)	22.3% (84)	.081 (a)
Regular heroin use prior to OST (years)	8.5 (35)	10.0 (360)	.203 (b)
Treatment factor			
Methadone	28.6% (10)	55.6% (209)	.007**
Buprenorphine	45.7% (16)	25.5% (96)	
Buprenorphine-naloxone	25.9% (9)	18.9% (71)	
Methadone, average dose (mg)	102.0 (10)	99.2 (209)	.764 (b)
Buprenorphine, average dose (mg)	18.0 (16)	19.2 (96)	.316 (b)
Bup.-nax., average dose (mg)	19.1 (9)	18.7 (71)	.836 (b)
5–7 days/week	31.4% (11)	34.8% (131)	.244
2–4 days/week	48.6% (17)	35.1% (132)	
1 day/week/more infrequent	20.0% (7)	30.1% (113)	
Treatment duration <12 months	31.4% (11)	40.1% (150)	.130
Treatment duration 12–36 months	48.6% (17)	31.8% (119)	
Treatment duration >36 months	20.0% (7)	28.1% (105)	
Previous OST	37.1% (13)	36.2% (136)	.909
Current drug use			
Alcohol past month	74.3% (26)	48.3% (181)	.003**
Alcohol consumption, days/month	14.0 (26)	7.0 (181)	.000*** (b)
Illicit drug use, any drug	71.4% (25)	44.0% (165)	.002**
Amphetamine	29.4% (10)	7.5% (27)	.000***
Cannabis	22.9% (8)	15.3% (56)	.244
Heroin	20.0% (7)	13.1% (49)	.256
Cocaine	12.5% (4)	5.0% (17)	.093 (a)
Sedatives/depressants	51.4% (18)	31.7% (117)	.018*
Novel psychoactive substances	50.0% (11)	27.4% (58)	.027*
Experience of illicit use			
Used methadone outside treatment	85.7% (30)	88.0% (331)	.940
Ever injected methadone	54.8% (17)	44.3% (154)	.254
Used mono-buprenorphine outside treatment	88.6% (31)	79.8% (300)	.267 (b)
Used buprenorphine-naloxone outside treatment	65.7% (23)	50.0% (185)	.075
Bought/received methadone from OST patient	93.3% (28)	69.5% (228)	.006**
Bought/received buprenorphine from OST patient	93.1% (27)	67.3% (191)	.004**

Significance levels (95% CI): *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$. Significance tests are χ^2-test, except (a) Fischer's exact test and (b) t-test.

How the Diversion Started

The qualitative interviews revealed various typical cases of how regular diversion may start. For most informants, diversion was not something they had planned when they entered treatment. Instead it begun only after some time had elapsed—weeks, months, even years—as a result of various "trigger events."

A recurring theme in several interviews is that a *relapse into illicit drug use* can act as a trigger event. For instance, a man aged about 35, explained how he had sold buprenorphine on and off during the three years he had been in OST. This had always been in connection with a relapse. Another patient, a woman around age 25, told us how she started selling off her buprenorphine when the controls became more infrequent, and she was allowed to collect her medication at a pharmacy instead of taking it under supervision at the clinic: "My goal [with the treatment] was to become normal, and get rid of my anxiety, but the

medication was not quite enough, I relapsed. The first time I was allowed to pick up [the medication] at a pharmacy, I sold everything I received, 84 tablets, and bought heroin." After her relapse, the woman regularly sold to acquaintances outside the program, in order to fund her own drug use.

Demand from friends and acquaintances is another common theme. A woman in her 40s, in treatment for three years, told us that she sold her methadone to an acquaintance who had previously been in OST. She started diverting medication when her acquaintance was involuntarily discharged from the program. Periodically, the woman had also shared her medication, for free, to a close friend suffering from back pain. Her friend had asked to try methadone, since no other analgesic had helped. Another patient, a man about 35 years of age and with a history of several treatment episodes, told us that he had always sold medication when in OST. This had started by friends "nagging and asking for help" when he himself had entered treatment. Several respondents, both in the qualitative and the quantitative interviews, bore witness to nagging and attempts at persuasion from friends and acquaintances not in treatment.

Two men, both in their 40s, *shared with their partners* from the beginning of their treatment. One of them revealed how he shared his buprenorphine with his girlfriend while she was waiting for a place in OST, but that he recently, after she had been admitted to the program, instead was sharing some of the medication with a couple of his friends. The other man had been sharing his medication for about ten years with his live-in partner. His partner used buprenorphine for self-medication purposes for her anxiety issues, but in the absence of a documented heroin addiction, she was not eligible for treatment.[b] "I see it as our medication, not mine," he explained.

Another trigger event for selling medication is *pecuniary need*. A woman around 55 years of age told us that she started selling when she needed an extra source of income in order to make up for deficiencies with her social benefits. She had been selling regularly throughout those stretches when she felt well enough to go without part of her methadone dose. "Often I need my dose myself, in order to function; I've been on heroin and pills for a long time. But sometimes I manage to save some, and then I can sell it and get some extra money."

Dissatisfaction with the medication, for instance as a result of side effects, may also function as a trigger event. One man, roughly 45 years old, claimed that he felt obtunded when he took his entire dose of buprenorphine (24 mg): "I can't cope with the full dose, and I don't want to take it all since I'm also using pills," he explained. A woman in her 40s, whose diversion activities dated back a few years, told us that she had reduced her methadone dose due to a weight increase, and a perceived passivization. However, she dared not inform the staff of this, since she was worried that she would not be allowed back on the higher dose if the need arose. She saved her surplus methadone to keep it in reserve. After a while, however, she met a fellow patient who—when our respondent confessed to having cut down—offered to buy her surplus.

Regular diversion has sometimes also been planned already when treatment was initiated. This was clear from a couple of interviews with people who had shared their medication with their partners or close friends. Entering OST solely in order to sell medication, *as a business venture*, however, seems not to be commonplace, although one patient admitted to having done this. The man had been prescribed buprenorphine by a general practitioner (GP) more than ten years earlier, when he was in his 20s. He collected the medication at a pharmacy, and sold nearly all of it from day one. "I received 100 tablets at a time, five collection batches in total, and no intervals between collections. So I just went around to friends and sold until the prescription ran out," he explained. The man had been in and out of treatment several times, and always sold the overwhelming part of his medication. This continued even after controls in the Swedish OST framework were tightened, and prescription of buprenorphine was banned in primary healthcare.[c]

Motives for Diversion

In the quantitative interviews we asked all respondents who stated that they, at some point, had sold, shared or exchanged their medication ($n = 277$) about their motives for doing so. They were offered six response options, and 272 respondents ticked at least one option. Table 2 summarizes the stated motives for regular diverters and other diverters, respectively. "To help a friend or partner" is by far the most common motive, and was given as the reason by 91.4% of regular diverters and 88.3% of other diverters. The motive "Need of money" is also common, stated by 54.3% of regular diverters, and 39.7% of other diverters. The difference between the groups is going in the expected direction, but still lies within the margin of error (χ^2 test, $p = .093$). However, there is one conclusive difference (χ^2 test, $p = .008$) when it comes the motive "Did not need the entire dose myself." As a factor, this was decidedly more common among regular diverters (31.4%) than among other diverters (13.8%). The difference between regular diverters (20.0%) and other diverters (9.2%) regarding the motive "Wanted to cut down" is close to significant (χ^2 test, $p = .053$).

No gradation was made in our quantitative interviews as to which motives were the most important for those patients who stated several motives. Nevertheless, the qualitative interviews indicate that financial gain is a central motive for the majority of those who continue to sell part of their medication, regardless of the event triggering the diversion.

A number of the patients that were interviewed pointed to their *precarious financial situation* and that the profits they made from selling medication made a great difference to them. For instance, one woman aged about 55, pointed out that the she got SEK 250–300 (EUR 27–32) per vial of methadone she was able to spare. "It's an important extra. I'm not doing it because I don't need my methadone, it's purely a question of me being hard up. I am on a disability pension, SEK 6,000 (EUR 650) a month to live on, and it's difficult to make ends meet." Another patient, a man about 35 years of age, said that he sold buprenorphine because he no longer wanted to be a criminal, being forced to steal, and also because he felt ashamed living off his parents. He described the selling of medication as something that benefited everyone: himself, his customers, and society.

For patients who *need money for illicit drugs*, profits from diversion can also be crucial. OST medication can be exchanged for other substances (such as benzodiazepines or other sedatives), or sold. Selling a sizeable part of the medication can bring in substantial sums each month. The woman aged around 25, discussed in the previous section, who relapsed when she was allowed to manage her medication herself, claimed to have earned a maximum of SEK 12,000 (EUR 1,300) per month by selling her buprenorphine (2 tablets/day $\times$ SEK 200).

Profits from diversion may also be *saved up*, if it is feasible to do so. One example of this was a woman in her 40s who had cut down on her methadone, due to side effects. The woman was gainfully employed and drug-free. For this reason, she used the lion's share of her profits to build up a savings buffer.

TABLE 2. Regular Diverters Versus Other Patients: Motives for Diversion

Motive	Regular Diverters ($n = 35$)	Other Diverters ($n = 239$)	p-Values
To help a friend or partner	91.4% (32)	88.3% (211)	.418 (a)
Need of money	54.3% (19)	39.7% (94)	.093
Did not need the entire dose myself	31.4% (11)	13.8% (33)	.008**
Wanted to be able to get high on heroin	5.7% (2)	15.1% (36)	.102 (a)
Wanted to cut down	20.0% (7)	9.2% (22)	.053
Was threatened or pressured	2.9% (1)	4.6% (11)	.532 (a)

Significance levels (95% CI): $^{**}p \leq .01$. Significance tests are χ^2-test, except (a) Fischer's exact test.

Patients giving away large parts of their medication for free, from *altruistic motives*, also feature in the interview data. The most obvious examples are the cases of diversion to a partner which we discussed earlier, but there are also cases where patients share their medication with close friends. The patient accounts show that financial gain and altruism are not necessarily mutually exclusive motives; on the contrary, a number of regular diverters cite money and a wish to help friends and acquaintances as driving forces. A man in his 40s told us that he relatively frequently shared his buprenorphine with friends, and that he used to offer it for free. "Since I know what it's like to be sick, I gladly hand it over to my friends if I can, but I wouldn't do it for a longer period of time, unless it was a really great friend." The man claimed to make handy illicit profits and for this reason he did not need to charge for the medication. However, there were situations when he did so, more specifically if he felt that he would otherwise be "exploited." In such cases he charged for the medication "because it's the right thing to do."

How Much of the Prescribed Dose Is Diverted?

The quantitative material shows that regular diverters on average do not receive higher doses than other patients (see Table 1). A prerequisite for regular diversion, however, is that the patient routinely takes a lower dose than the prescribed one. Based on the qualitative data it is hard to make any generalizations as to how large a part of the dose is typically sold or given away. It seems to vary, both from patient to patient, and over time.

Nevertheless, some patterns emerge. It seems to be *easier to cut down when using buprenorphine than on a methadone prescription*. Most regular diverters with a buprenorphine prescription claimed to be able to get by on 8–12 mg a day. Consequently, if they had a prescription for 16 or 24 mg they were able to sell or give away one or two tablets a day. A man aged about 35 had recently been discharged from OST when he was interviewed. He was unfazed by the discharge, and told us that from now on, he would have to buy his buprenorphine on the black market instead—he used 8 mg a day, regardless of whether he was in treatment or not, and he had previously sold the remainder of his 24 mg prescription. The methadone patients that we interviewed more often claimed that they had difficulties in coping on less than the entire dose, and were struggling to put aside any vials. However, there were methadone patients as well who claimed to be able to get by on half of their prescribed dose, or even less.Another pattern is that it seems to be *easier to vary the dose when taking buprenorphine compared to methadone*, since the withdrawal symptoms and the craving for drugs kick in later. Coping for a day without buprenorphine was fine, several patients explained, while going a day without methadone seems to be more difficult. A *lower medication dose can be compensated* by using other substances, mainly sedatives or alcohol. The quantitative interviews show that regular diverters use more of these drugs than other patients (see Table 1). It should also be pointed out that *patients who are heavy users of heroin often have difficulties in taking their buprenorphine*. Buprenorphine, which is a partial agonist, activates the μ receptors to a lower degree than heroin, but has a higher binding capacity (affinity) than heroin. Therefore, buprenorphine may trigger withdrawal symptoms in users who have taken high doses of heroin. One of the interviewees, a man around 35 years of age, stated that he very recently had relapsed on heroin, and that he on that occasion had sold all his medication. When he was interviewed, he was trying to break the relapse by taking a small quantity of buprenorphine in the evening, and then gradually increase the dose.It is worth noting that only one of the interviewees, a man with a buprenorphine prescription, stated that his strategy was to maximize the dose during the startup phase in order to acquire a surplus which he could sell. Several other respondents, however, stated that they initially had wanted as high a dose as possible, since they had perceived more as better.

Customers and Recipients

The recipients of the methadone and buprenorphine which is sold or given away, are primarily *heroin users or other users with an opioid addiction*.[d] People from the drug milieus that the seller (or donor) comes from him-/herself were mentioned by all the interviewees. They can be divided into three subcategories.

Partners or close friends are recipients who typically are offered the substances for free. Several of the interviewees informed us that they had shared medication with people in this category, as previously discussed in the article.

Friends and acquaintances who are former drug partners constitute another recipient category. The interviewees were generally prepared to share medication for free on a small scale to people in this category, out of compassion or because they themselves had received similar help previously. However, if the transfer continues for a longer period of time, it typically also means that the recipient pays for the medication. One interview, a man aged around 45, described how he used to share his buprenorphine with three friends, one of whom paid, while the other two received theirs for free since they were close childhood friends. The man pointed out that he never sold to strangers, partly for security reasons, and partly because he did not feel it was right to "to pull others down into the gutter."

The third recipient category is *people whom the interviewee recognized from the drug milieu*. In this case it is basically always a question of selling, according to the interviewees. Patients who regularly sell their medication may have a permanent client relationship with a few returning customers. A woman in her 40s explained that she had had one regular customer when she sold her medication, a patient whom she had come across at the clinic, and who bought all the methadone she could spare. The customer stood on too low a dose, and furthermore gave to her partner who was not enrolled in OST. However, there were also sellers with a more extensive customer base. A man, about 35 years old, described how he used to look for buyers at two well-known drug-dealing spots in the city—one of them only a block away from the OST program, while the other was located in the vicinity of the hospital compound. Another man, also aged about 35, told us that he used to sell buprenorphine by mail, to people living in the town where he used to live. The market price was considerably higher there, thus leading to higher profits.

Three interviewees admitted that they had *sold to strangers* as well; all three of them had a buprenorphine prescription. Two of them had been street dealers, selling other drugs as well. One man in his 40s explained that he previously had sold buprenorphine on a large scale. He bought the tablets from patients in Stockholm and then sold them on at a considerably higher price in his hometown. The other dealer—a man who in the early stages of his treatment had sold almost his entire prescription—stated he had had some ten regular customers. "I was going round like a pharmacy, selling in the apartments. To people who used it as a party drug, and to some who was really stuck on it. But I never sold to beginners," the man stressed.

Nearly all regular diverters held the opinion that it is morally right to share with friends, and defensible to sell to people with an opioid addiction. In addition, most of them felt that methadone and buprenorphine help to save lives, even when used illicitly. "I think it's OK to sell or share some for free to others who are in bad shape. I know myself how I've felt, and how methadone has saved me many times," one woman, aged about 55, explained. On the other hand, the majority of the interviewees felt it was wrong to sell to adolescents, or others who have not developed an addiction already. The woman continued: "I only sell to people I know, whom I know to be heroin addicts, who want to detox, who suffer withdrawal symptoms, or have been unable to find heroin. I would never sell to a young person whom I didn't know. Those who do, have no conscience." Another interviewee, a man around 45 years of age, considered his actions to be a good deed: "I'm not recruiting any newcomers, I'm sharing only with heroin addicts, people who definitely know what they're doing. I've

told them they mustn't inject it, I mean it's Subuxone that I've got, and you mustn't do that with these tablets." The man also stated that he had been considering to start selling by mail, but had not yet done so. "I've got a friend in X-ville—we used to be locked up together—I've thought of getting in touch with him to hear if he knows of anyone who's in need. But at the same time, I'm a little bit in two minds, not knowing who'll get the medication."

How to Handle the Controls

There are no significant differences between regular diverters and other patients as regards handing-out procedures (see Table 1). It is more difficult to divert medication when patients are collecting it frequently and take it under supervision, but at the same time these patients use alcohol and illicit drugs to a greater extent than those who pick up their medication at greater intervals, and as a result they are more prone to divert medication.

As previously discussed, buprenorphine patients are overrepresented among the regular diverters. With supervised dosing it is, naturally, easier to pilfer away buprenorphine tablets than liquid methadone. Several buprenorphine patients described various techniques they employed to smuggle tablets out of the clinic: Keep one or more tablets in your hand, and only pretend to put them in your mouth. Take the tablets out of your mouth before they dissolve. The dissolution time can be prolonged by drying out the mouth thoroughly before taking the medication, or by keep a piece of paper or cling film in the mouth to protect the tablets. "Sure, they check when you take the medication, but you know, there's no real difficulty in sneaking away some," a 35-year old man claimed. A couple of the interviewees spontaneously showed tablets they had just taken out of their mouths, and one man demonstrated the technique he used to ensure that the staff did not notice that he only took one of his three tablets. "It requires skill, and you need to be careful," he said.

In order to smuggle out liquid methadone you either have to be very dexterous and swap the vial, or keep the liquid in your mouth and spit it out in another bottle after the visit. The authors were told about such techniques, both by patients and members of staff, but none of the patients they interviewed in depth had ever tried them. In the quantitative material 11 out of 35 regular diverters collected their medication between five and seven days a week, but only two of those 11 were methadone patients.

Patients who are allowed several take-home doses can use other methods, in addition to those previously described. Methadone patients can vary their dose and take a little less on the days when they are taking the medication under supervision. As pointed out previously, a lower dose may be supplemented by other substances, such as benzodiazepines or alcohol. Buprenorphine patients find it easier to vary their dose. The extended effect of buprenorphine, and its capping of agonist activity, means that there is no need to administer the drug every day—patients who are used to a particular dose can take a double or treble dose every other or every third day instead.[43] Such a dosage regimen may be used therapeutically—to reduce the need to take doses home, or the number of take-home doses—but also creates an opportunity for diversion. One patient, a man aged about 35, took his buprenorphine under supervision for two days every week, Mondays and Thursdays, and then received take-home doses for the rest of the week. On the days when he visited the clinic, he took all three tablets (24 mg), but for the next two days he took nothing at all, and on Sundays he took one tablet. By following this dosage regimen he was able to sell 14 tablets each week.

Regular diverters also have other means of getting around the control measures. One woman, about 25 years old, who had sold all her medication when she suffered a relapse, told us that rumors were going around that she was selling her medication. This resulted in her being prescribed crushed buprenorphine tablets when she took her medication under supervision. To avoid heroin withdrawal symptoms she swallowed the crushed tablets, exploiting the fact that buprenorphine has a very low oral bioavailability.[44]

Buprenorphine patients who are heavy heroin users—and for this reason are unable to take their medication—run the risk of getting caught by their urine samples. A urine sample which tests positive for heroin, but negative for buprenorphine indicates that the patient is not taking his/her medication—and this may serve as grounds for a discharge from the program. One of the patients who was interviewed in the quantitative study had self-medicated on buprenorphine before he was admitted to an OST program. He bought the substance from a regular diverter, who sold all of his medication. As part of the payment he supplied the seller with "clean" urine; buprenorphine positive but negative for all other substances. The seller used this to manipulate his own urine samples. In this particular case the treatment worked well enough—but for the wrong person.

DISCUSSION

The Regular Diverter—A Patient Like Any Other?

Regular diverters stand out as a small, yet heterogeneous group. Some of the interviewees were patients with a precarious life situation, who sold the greater part of their dose in order to fund other drug use. Other patients were drug-free and gainfully employed, but for financial reasons still sold part of their medication. Some patients had cut down on their prescription doses, in order to reduce side effects or because they were trying to quit the treatment, and then sold their surplus medication. However, the authors also came across patients who, from altruistic motives, shared their medication with a partner or a good friend, because he or she had been involuntarily discharged from a program, or lacked sufficient documentation (of opioid addiction) to be admitted to the program.

Although "anyone" can engage in regular diversion, there are specific patient categories where the practice is more common. Regular diverters are more likely to have used illicit drugs in the past month than other patients (χ^2 test, $p = .002$). A substantial majority uses alcohol, drinking more often than other patients. Mono-buprenorphine is more common among regular diverters than among other patients, while methadone is less common. Furthermore, regular diverters were more likely than other patients to have had OST patients as their main source of illicit methadone and buprenorphine before they were admitted to treatment.

It is worth noting that the factors that we have identified in this study are identical to the factors which distinguish the larger patient population who are currently diverting medication from non-diverting patients. In an earlier article logistic regression analysis was used to compare the group of patients who had sold, shared or exchanged their medication at least once in the past month ($n = 99$), with patients who claimed not to have done so ($n = 312$).[34] The likelihood of diversion was significantly higher among patients with current drug use, among patients who had had other patients as their primary source of illicit methadone or buprenorphine, and among patients who mainly socialized with active drug users. Furthermore, the likelihood was higher among patients with a mono-buprenorphine or buprenorphine-naloxone prescription than for methadone patients.

There is nothing in the results to indicate that regular diverters are "fortune seekers" who have gained admission to OST in order to sell their medication—a fear sometimes voiced in the public debate about this form of treatment, and by some members of staff.[42] In the quantitative data, regular diverters had on average a history of 8.5 years of regular heroin use (SD: 4.4), not a significant deviation in comparison to other patients (10.0 years, SD: 6.8).[e]

On the other hand, there is some evidence pointing to regular diverters being a select group, in the sense that they are capable of getting by on less medication than other patients. There is no difference in the average dose between the groups, but large scale selling or sharing of medication requires a long-term capacity to cope on a lower dose than the actual prescription. The motives "Did not need the entire dose myself" and "Wanted to cut down" were more prevalent among regular

diverters than other patients who had sold or shared medication.

Understanding Diversion

Cicero and Inciardi claim that a certain amount of diversion—a "spillage effect"—always should be expected when prescribing addictive, psychoactive medication.[31] Consequently it is more or less unavoidable that narcotic drugs, such as methadone and buprenorphine, will end up on the illicit market.[18,39,40]

In previous studies, the illicit markets for methadone and buprenorphine have been described as more or less closed systems, consisting of OST patients and street heroin users. In a study of the market for illicit methadone by Spunt and colleagues,[20] the customers were divided into four different categories, the two most common being heroin users who wanted to avoid withdrawal symptoms when heroin was hard to come by, and heroin users who used the methadone for self-administered detoxification or treatment. Less common as customers were heroin users who wanted to use methadone to achieve drug euphoria, and methadone patients who wanted to increase their dose in order to get high or because they felt that their regular dose was insufficient to stem the craving for drugs. There was no evidence of the abuse spreading to new populations.[20] A later study has shown similar results.[16]

The authors' analysis of regular diverters gives us no reason to question the above description. The customers for the interviewees have consisted of people from the drug milieus they come from themselves: partners, friends, acquaintances, and acquaintances of acquaintances. The interviewees depict a norm system where it is considered right or legitimate to sell or share with people who are in "need" of the substances, that is to say, to people with an established opioid addiction, but wrong to pass them on to new users. The findings lend no support to the notion that regular diverters would be passing on their substances to new drug users—a fear expressed by OST staff members.[42]

Diversion of prescription drugs has been described as a "disorganized for-profit industry" with a number of actors involved.[33] Such a description is only partly correct when it comes to the market for methadone and buprenorphine. Regular diverters are often driven by a profit motive, but altruistic and reciprocal motives are also very common. Partners and close friends may receive these substances for free, while more distant friends and mere acquaintances will have to pay, at least if they are getting more than the occasional dose.

In a previous article,[34] the authors referred to U.S. anthropologist Bourgois, who has argued that "a moral economy of sharing" often develop among drug users; a norm system where it is considered unethical not to share the substances one has acquired with friends who are suffering from withdrawal symptom.[45,46] In such a moral economy, profit motives and altruistic motives often go hand in hand, which is clearly illustrated by this study.

Implications

Controls and restrictions play a fundamental role in OST, partly due to the risk of diversion. At the same time, these controls and restrictions are an intrusion, and impose limitations on the lives the patients lead. Consequently, the control measures employed need to be well balanced—misdirected or excessively strict measures have a negative therapeutic impact, and run the risk of worsening rather than alleviating the problems.

The design of handing-out procedures is an important factor for diversion prevention. British research indicates that national directives on supervised dosing had the effect of markedly reducing methadone-related mortality in Scotland and England during the period of 1995–2005.[6,8] However, supervised dosing can also be seen as an indignity, impose serious restrictions on the autonomy of patients, and reduce the opportunities for gainful employment or other occupation.

The controls at Swedish OST programs are strict, generally speaking, with daily supervised dosing for the first six months of treatment,

regular urine testing, and suspended take-home doses in case of relapse. Nevertheless, this study indicates that regular diverters are relatively unmoved by the threat of sanctions, and that control measures appear not to prevent them from selling or sharing part of their medication. A general tightening of controls therefore runs the risk of having little or no effect on this group, while hurting patients who are following the rules.

However, targeted control measures should be employed in cases where individual patients are suspected of diverting. Such controls may involve accounting for take-home doses, periods of strict supervised dosing, blood tests for analysis of plasma concentration, and prescribing crushed tablets for buprenorphine patients. The high risk of diversion among mono-buprenorphine patients suggests this substance should be avoided, unless there are specific reasons for using it. Another possibility is to combine mono-buprenorphine prescriptions with stricter supervision, at least for patients who are unemployed.

A third possibility is to administer buprenorphine more infrequently. Methadone must be taken every day, whereas buprenorphine—as confirmed by several studies—can be taken every other or every third day (as a double or treble dose) without any deterioration in treatment outcomes.[43] Such dosage regimes reduce the need of take-home doses.

This article, as well as some previous research, indicates that diversion is associated with other issues, first and foremost continued illicit drug use and high consumption of alcohol.[20,34] Such issues are frequently symptoms of psychological ill-health, for instance anxiety or sleep disorders, which the patient is trying to self-medicate. Self-medication can also be aimed at physical symptoms, such as pain conditions. Accordingly, it is critical to continuously follow up the physical and psychological health of patients, in order to apply supplementary treatment if necessary. In addition, it is also important to follow up the dosing of the medication, and the side effects experienced by patients, since such issues may function as trigger events for diversion.

As pointed out in the introduction, previous research suggests that diverted methadone and buprenorphine are primarily used by intravenous drug users as well as other users with a heroin or other opioid addiction.[14–19] It is often a question of users trying to avoid withdrawal symptoms ("to stay healthy and well"), alternatively to manage their own OST using illicit medication.[24,26] This picture is confirmed by the descriptions by the interviewees. This suggests that measures to reduce OST waiting lists, lower thresholds to treatment, and increase retention in OST programs could have a preventative effect on diversion. Such measures could help to reduce the illicit demand, and lower the street value of these substances.

NOTES

a. In the quantitative interview study, regular diverters—a population which, according to the author's definition, constituted 8.5% of the total number of patients interviewed—were responsible for more than 80% of the self-reported days with diversion.
b. In Sweden, OST is only offered to people with a documented opiate addiction (heroin, morphine, or opium) of at least one year's standing. Such documentation may be issued by addiction treatment services, social services, the penal system, needle exchange programs, etc.
c. Methadone-based OST has been strictly regulated in Sweden ever since its inception in 1966, and may only be ordered by psychiatrists. However, when buprenorphine was added to OST framework in 2000, all physicians had the authority to prescribe this substance. A public debate on diversion led to buprenorphine being subject to the same regulations as methadone from 2005 onward.
d. The reason why these users require illicit methadone or buprenorphine may vary, but it is often a case of trying to avoid withdrawal symptoms (for instance if they have failed to get hold of heroin) or wanting to

perform self-detoxification or manage OST on their own. Such "self-treaters" may be users who are on the waiting list for a program, have been involuntarily discharged, or have an ambivalent attitude toward OST, or for other reasons have chosen not to apply for a place in treatment. The motives for and experiences with self-treatment will be studied in a separate article, based on some 30 qualitative interviews.

e. Out of all the 411 patients that were interviewed, only one admitted that he had sought treatment in order to get access to medication that he could sell. This user had been prescribed buprenorphine by a GP in the early 2000s, without having to provide documentation of opiate or opioid addiction (see also endnote b).

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