
THE IMPACT OF HEROIN PRESCRIPTION ON HEROIN MARKETS IN SWITZERLAND

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***Abstract:** A program of heroin prescription was introduced in Switzerland in 1994. This initially targeted 1,000 heavily dependent heroin users, most of whom were also involved in drug dealing and other forms of crime. It has recently been extended to cover 3,000 users. Evaluation of its impact on users shows large reductions in use of illicit drugs and in drug-related crime. The evaluations were not designed to assess the program's impact on drug markets, but some data can shed light on this. It seems likely that users who were admitted to the program accounted for a substantial proportion of consumption of illicit heroin, and that removing them from the illicit market has damaged the market's viability. Before involvement in the program, a large proportion of users sold drugs to finance their own use, since the illicit drug market in Switzerland relies heavily on users for retail drug selling. It is likely, therefore, that the program additionally disrupted the function of the market by removing retail workers. The workers no longer sold drugs to existing users, and equally important, no longer recruited new users into the market. The heroin prescription market may thus have had a significant impact on heroin markets in Switzerland.*

SWISS DRUG POLICY: FROM NEEDLE PARKS TO DRUG SUBSTITUTION

Until the late 1980s, Switzerland followed a conventional drug policy, with heavy police pressure on addicts and dealers. Until around 1985 and after, it was standard practice to confiscate injecting materials. The sudden appearance of AIDS, and — in an international perspective — the unusually high prevalence rate of HIV infection led to a rethinking of conventional practice. It was recognized that the drug problem played a substantial role in this context. Nearly one half of the regular heroin users were found to be HIV positive at that time.

The immediate response was the establishment of medical care for drug addicts. Among other measures, sterile injection materials were made available to addicts on a large scale, and certain cities opened injection rooms where addicts could also get various forms of social and medical assistance. This policy was very successful in the sense that those who started injecting heroin after its implementation, i.e. after around 1985, were found to test positive for HIV at a rate of less than 5% (Grob, 1993). An unanticipated side effect of offering social and medical assistance to addicts and, concomitantly, reducing police pressure on drug markets, was the extension of needle parks in major Swiss cities to dimensions never seen before. This stage of Swiss drug policy produced particularly ugly images of drug misuse that attracted international coverage as an example of the dangers of liberal drug policies.

Within Switzerland, public drug-using sites led to major public order problems in certain urban areas (Eisner, 1993). The feeling that "something" should be done about these sites was shared by all significant political forces. However, vigorous steps to "close" the Zurich needle park failed to eradicate the problem; such initiatives only shifted addicts to adjacent residential and commercial areas. After a few weeks, a new needle park emerged less than a mile away from its predecessor.

Thus, a wide political consensus to close all needle parks emerged in the country, as well as the wish to try new drug policies that might allow the maintenance of medical and social assistance to addicts without producing new public using sites. In this context, drug substitution became an essential part of Switzerland's national drug policy (Killias, 1999). Despite strong opposition to its introduction in late 1993, several referendums have confirmed that drug substitution is supported by a large majority of voters. In October 1998, the Parliament voted a law allowing extension of heroin prescription to 3,000 (instead of fewer than 1,000) subjects. On June 13, 1999, this law

was accepted in a national referendum with 55% of the votes approving the measure.

HOW DOES DRUG SUBSTITUTION WORK?

Late in 1993, the Swiss government decided to allow, on an experimental basis, trials with prescription of heroin (and a few other opiates). After an initial pilot period, this program was extended to about 1,000 recipients, of which 800 received heroin. In addition to this project, methadone was made available to about 15,000 users. Thus, a significant part of Switzerland's opiate users became engaged in substitution programs.¹ In this paper, we are only concerned with heroin prescription.²

The main features of heroin prescription are (Uchtenhagen, 1997a; Rihs-Middel, 1994):

- In order to qualify, users have to (1) be at least 20 years of age; (2) have been addicted to heroin — daily use — for at least two years; (3) present signs of deterioration of health and/or social relations as a result of drug use; and (4) be engaged in conventional treatment without success despite two or more attempts.
- Those prescribed heroin are assigned to special clinics that offer also a wide array of medical and social assistance. No clinic has more than 150 patients.
- Heroin can be obtained solely at the clinic, and it has to be injected on the spot. No heroin can be taken away. If the patient is unable to attend the clinic, he/she will be aided by receiving methadone.

The population enrolled on this program presented a wide range of medical³ and social problems (Uchtenhagen, 1997b); they also displayed an unusually high involvement in drug use and crime:

- Overall, the average age of participants was just over 30, with an average career of heroin use of 10 years.
- The prevalence of criminal backgrounds was unusually high: 87% had a criminal record, with an average of eight previous convictions. More than half had been imprisoned at least once. For the general (male) Swiss population of that age, the lifetime prevalence of convictions is about 25%, and the lifetime prevalence of custodial sentences is about 6%.
- According to self-reports (Killias and Rabasa, 1998), around 70% were engaged in offending during the six months before

admission to the program, more than 50% were involved in drug trafficking, around 40% in minor thefts (e.g., shoplifting, receiving or selling stolen property) and more than 10% in serious thefts (e.g., mugging, robbery, burglary).

Given the profile of the treated population, occasional criticisms that the Swiss program included many low-level and occasional users seem absolutely unfounded.

It has been estimated that the number of seriously dependent heroin users meeting the program's criteria of eligibility is likely to be about 3,000. Thus, the new extension voted by the Parliament will make heroin substitution available to a significant proportion, if not the most current "problematic" users.

EVALUATIONS OF THE PROGRAM

As an essential part of the project, all trials had to be evaluated by independent research institutes. The main findings can be summarized as follows:

- (1) Medical and social psychiatric research (Uchtenhagen, 1997a; 1997b) has shown a substantial improvement in health and social conditions among those prescribed heroin. The same is true in relation to employment and social rehabilitation.
- (2) The criminological evaluation (Killias and Rabasa, 1998; Killias et al., 1998) has established a substantial fall in criminal involvement (whether measured by rates of prevalence or incidence). This fall was greatest (50% to 90%) for the most serious offenses, such as burglary, muggings, robbery and drug trafficking. It was observed with all indicators used, i.e. self-reports, victimization, police records, and conviction records. Thus, it is hard to think of any validity problem that could have affected these various and independent crime measures so consistently and to such an extent. Moreover, a comparative study of these measures has shown the validity of self-reported delinquency in this particular context (Aebi, 1999).
- (3) The program's impact on national and city crime levels was not evaluated. It was felt that the number of subjects eligible for heroin substitution was too low to affect aggregate crime levels. Data on muggings from Zurich suggest, however, that some effect might have occurred in this respect (Killias and Rabasa, 1998). Another visible outcome was the substantial reduction of open, drug-using sites in Swiss cities.

- (4) For the most part, the evaluations were based on "before and after" comparisons. Only a few randomized trials could be conducted comparing heroin and methadone. The tentative conclusions are that: (1) heroin is more effective in the recruitment of addicts, particularly among those who have failed treatment in the past; (2) those prescribed heroin are complying better with treatment conditions (i.e., less additional drug use); and (3) the drop-out rates tend to be lower for this group (Dobler-Mikola et al., 1998; Uchtenhagen, 1997a).

THE IMPACT OF HEROIN SUBSTITUTION ON DRUG MARKETS

In all its public statements about drug policy and heroin substitution, Swiss government officials consistently denied that this program could produce any effect on drug markets. Of course, the purpose was not to overstate the case of drug substitution, and to gain public support by pointing to positive effects of the program in areas where its success was less debatable (such as, for example, improving health conditions and reducing criminal involvement among addicts).

Since disrupting the heroin market was not included in the program's goals, evaluations have, so far, largely neglected outcomes in this domain, and few data have been collected that might be helpful in analyzing this issue. The following sections of this paper assemble what limited empirical results there are on drug dealing and describe, to a large extent hypothetically, longer-term effects of drug substitution on the heroin market.

Reduction of Demand Through Heroin Substitution

The main reason why Swiss policy makers did not anticipate effects of the current program on drug markets was the small number of addicts treated with heroin. At best, three to five percent of the estimated number of regular heroin users are currently prescribed heroin. Some might argue, therefore, that by taking out this small a share of actual buyers, no significant reduction in demand might be obtained on the market. The same argument might, implicitly, apply even with program's future extension to 3,000 regular users.

The problem with this view is that, within a given population of users, the distribution of actual consumption may be heavily skewed. As with alcohol — where 5% of the drinkers might account for 50% or more of the actual demand — a minority of heavy, regular heroin us-

ers might absorb a disproportionate quantity. Since heroin substitution tends to reach especially problematic users, i.e., heavy consumers, and assuming that 3,000 addicts represent 10% to 15% of Switzerland's heroin users, it does not seem not unrealistic to speculate that they may account for 30% to 60% of the demand for heroin on illegal markets.

The Outlook for Potential Market Responses

The question arises as to how the market will react to a drop in demand of such proportions. One possible strategy might be to promote new drugs, or those which are currently less popular in Switzerland, such as cocaine. It is difficult to assess whether such strategies will be successful, as displacement effects are always hard to study, whatever the offense to be prevented and the possible "alternative" crimes might be.

The data collected so far tend to show, however, a decline not only of nonprescribed heroin consumption, but also of other illicit drugs. As the following tables illustrate, police, as well as self-report data, consistently show that use of illicit drugs fell among those prescribed heroin; more significantly, incidence as well as "daily" use — i.e., proxy measures of the actual volume of consumption — decreased more than the number of users.

For example, in Table 1, police records show that the prevalence rate of police contacts (i.e., the percentage of patients contacted by the police) for use or possession of heroin during the first six months of treatment decreased by 68% in comparison to the six months preceding the treatment. When the comparison is extended to periods of 24 months before and after admission to the program, the decrease is 71%. Concerning the incidence rates of police contacts (i.e., the mean number of contacts per person), Table 2 shows that, for the same offense, the decrease is 78% for the six-month period and 88% for the two-year period.⁴

In Table 3 we can see that before admission and according to self-reports, those who did not use cocaine over the previous six months represented only 15% of the sample; but the proportion of noncocaine users increased progressively to 28% six months after admission, 35% after 12 months and, finally, 41% after 18 months. At the same time, Table 4 shows that 18 months after the beginning of the treatment, the daily users of nonprescribed heroin had fallen to 6%, while nonusers increased to 74%.

The reduction in the use of illicit drugs among subjects enrolled in heroin substitution points to a possibly opportunistic character of the use of additional drugs. Cocaine and other drugs were perhaps used

whenever heroin was unavailable or available only under unacceptable conditions.

Table 1: Drop in Prevalence Rates of Police Contacts for Use/Possession of Hard Drugs by Matched Periods of Time Before and After Admission to the Program

Substance	Observation Period			
	6 months before vs. 6 months after (N=604)	12 months before vs. 12 months after (N=336)	18 months before vs. 18 months after (N=153)	24 months before vs. 24 months after (N=108)
Heroin	-68%	-68%	-77%	-71%
Cocaine/ecstasy	-47%	-40%	-50%	-48%
Other drugs	-68%	-72%	-43%	-43%

Table 2: Drop in Incidence Rates of Police Contacts for Use/Possession of Hard Drugs by Matched Periods of Time Before and After Admission to the Program

Substance	Observation Period			
	6 months before vs. 6 months after (N=604)	12 months before vs. 12 months after (N=336)	18 months before vs. 18 months after (N=153)	24 months before vs. 24 months after (N=108)
Heroin	-78%	-82%	-87%	-88%
Cocaine/ecstasy	-54%	-47%	-48%	-54%
Other drugs	-85%	-69%	-35%	-36%

Table 3: Prevalence of Self-reported Use of Cocaine Before and After Admission, by Reference Periods of Six Months (N=237)

	6 months before the beginning of the treatment	After 6 months in treatment	After 12 months in treatment	After 18 months in treatment
No use in the last six months	15%	28%	35%	41%
Some use in the last six months	56%	63%	61%	52%
(Almost) daily use	29%	7%	4%	5%
Answer not clear	0%	3%	0%	2%

Sign tests for each line between first and last period: $p \leq .001$.
Source: Uchtenhagen (1997b:70).

Table 4: Prevalence of Self-reported Use of Nonprescribed Heroin Before and After Admission, by Reference Periods of Six Months (N=237)

	6 months before the beginning of the treatment	After 6 months in treatment	After 12 months in treatment	After 18 months in treatment
No use in the last six months	4%	61%	72%	74%
Some use in the last six months	14%	30%	20%	19%
(Almost) daily use	81%	6%	5%	6%
Answer not clear	0%	3%	4%	1%

Sign tests for each line between first and last period: $p \leq .001$.
Source: Uchtenhagen (1997b: 70).

Another market response might be to maintain demand at current levels by lowering prices. This might help in the recruitment of new consumers, an option we shall look at more carefully in the following section. Demand could also be stimulated by encouraging the remaining black-market customers to increase their consumption. Earlier research has indeed shown demand to be highly elastic in the sense that users of opiates manage to adapt consumption to market conditions, such as availability of preferred drugs, quality, prices, and the availability of cash (Grapendaal et al., 1995; Grapendaal, 1992). Therefore, lower prices could lead existing users to increase the quantities consumed and thereby increase the severity of their dependency. Research conducted in the U.S. has shown that drug use varies consistently according to availability of drugs, prices, and legal restrictions (cf. Hawkins et al., 1995). On the other hand, the results shown in Tables 1 to 4 suggest that a shift to increased consumption, either of heroin or other nonprescribed drugs, did not occur once addicts got their "base rate" through substitution programs.

Lower prices mean reduced profits, at least if costs of production, supply, and distribution cannot be adapted. Thus, such policies might impose some strain on organizations of dealers and increase internal conflict. Recent shifts in distribution networks and the emergence of new distributors (as well as the disappearance of others) may well be related to shrinking margins.

Interestingly, we are not aware of any research available, in Switzerland and other European countries, on the effects of lower prices on users, their habits of use, and networks of dealers. This lack of research is the more surprising as Europe has seen a dramatic drop in street prices of heroin over the last five to eight years. In Switzerland before 1990, one gram used to be sold for at least 500 Swiss francs, i.e., about \$300. Since then the price per gram has fallen to about 70 francs, about \$45. The reasons for this dramatic drop could be external, i.e., related to the emergence of new supply lines and distribution networks, and totally independent of local substitution programs and the impact they might have had on demand.

However, the prices of heroin, cocaine, and marijuana did not follow the same trend. Marijuana remained fairly stable at about 10 Swiss francs per gram (about \$6.5) over the last 10 years. Cocaine prices dropped from less than 200 francs (\$130) to about 120 francs (\$80) per gram.⁵ Thus, the drop of heroin prices was incomparably more dramatic. These different trends support the idea that demand for heroin might have declined. On the other hand, heroin prices started to decrease before 1994, when heroin treatment became an official option. The trend was similar in other countries without heroin prescription programs. The "missing link" may have been metha-

done prescription. Although somewhat less effective in preventing use of nonprescribed drugs, it certainly reduces the volume of demand among those treated, and it is, as a treatment option (Office Fédéral de la Santé Publique [OFSP], 1996), available to far larger numbers within and outside of Switzerland. Currently, about 15,000 of an estimated number of 30,000 regular opiate users receive methadone as a treatment. It would be surprising if a program of that size had no effect on demand. Research on drug markets in London confirmed, indeed, that markets are vulnerable to demand reduction through drug substitution programs (Edmunds et al., 1996).

With cocaine and marijuana the story may be different. Although the production of marijuana has increased substantially in recent years, especially within Switzerland, the prices may have been stabilized by an increasing demand, as documented by longitudinal data on drug use (OFSP, 1998). In the case of cocaine almost nothing is known concerning supply and demand, but the best guess may be that there were few changes.

Drug Substitution and the Recruitment of New Users

The current evaluation of substitution programs has established that selling heroin to other users had been the most common criminal activity of heroin users admitted to the program. According to self-reports, more than 50% of all subjects admitted to the program turned out to be dealers. This prevalence rate far exceeds the extent of acquisitive crimes, such as burglary or mugging (Killias and Rabasa, 1998). Police records confirm, for this population, the central role of drug dealing in earning illegitimate incomes (Killias et al., 1998).

Under the heroin substitution program, according to both self-report and police data (Tables 5 and 6), the prevalence and, even more so, the extent of drug selling dropped considerably. Interestingly, those who continue to sell illegal drugs, tend to be those who maintain use of nonprescribed illegal drugs (mostly cocaine, Table 7), probably because they do not cut their links to this particular milieu, unlike the majority of those on the program.

For example, in Table 5 we can see that, according to self-reports, the prevalence rate of hard-drugs trafficking (i.e., the percentage who admitted this offense) over the six months preceding treatment was 43%. This dropped to 10% during the first six months of treatment and to 6% during the last twelve months. At the same time, the incidence rate (i.e., the mean number of offenses per person) for the same offense decreased from 22.8 to 0.8.

Table 5: Prevalence and Incidence Rates of Self-reported Drug-trafficking for Periods of Six (A, B-1, B-2) and 12 Months (C-1) Before Each Interview (N=242)

	6 months before the beginning of treatment (A)	After 6 months in treatment (B1)	After 12 months in treatment (B2)	After 24 months in treatment (C1)
Prevalence of soft-drug trafficking	23%	15%	12%	12%
Prevalence of hard-drug trafficking	43%	10%	6%	6%
Incidence of soft-drug trafficking	7.8	1.5	2.5	1.3
Incidence of hard-drug trafficking	22.8	2.8	1.4	0.8

Table 6: Drop in Prevalence and Incidence Rates of Police Contacts Related to Drug-trafficking, by Matched Periods of Time Before and After Admission to the Program

	Observation Period			
	6 months before vs. 6 months after (N=604)	12 months before vs. 12 months after (N=336)	18 months before vs. 18 months after (N=153)	24 months before vs. 24 months after (N=108)
Prevalence	-63%	-51%	-61%	-61%
Incidence	-58%	-50%	-73%	-80%

In Table 6, police records confirm this trend showing the prevalence rate of police contacts for drug trafficking during the first six months of treatment decreased by 63% in comparison to the six months preceding treatment, while the incidence rate decreased by 58%. When the comparisons are extended to periods of 24 months before and after admission to the program, the decrease is 61% for the prevalence rate and 80% for the incidence rate.

Finally, in Table 7 we can see that, according to self-reports and during the first six months of treatment, 10% of the patients who did not use illicit drugs ("nonconsumers") had sold soft drugs, while among those who used illicit drugs ("consumers") this percentage was 18%. At the same time, the average number of soft-drug trafficking offenses was 0.7 for the non-consumers and 2.6 for the consumers.

Table 7: Prevalence and Incidence Rates of Self-reported Drug-trafficking for a Period of Six Months Before Each Interview, by Consumption of Nonprescribed Hard Drugs (Cocaine and/or Heroin; N=305)

	After 6 months in treatment (B1)			After 12 months in treatment (B2)		
	non-consumers	consumers	p*	non-consumers	consumers	p*
Prevalence of soft-drug trafficking	10%	18%	.09	12%	14%	NS
Prevalence of hard-drug trafficking	0%	16%	<.01	1%	15%	<.01
Incidence of soft drug trafficking	0.7	2.6	NS	2.3**	2.2	NS
Incidence of hard drug trafficking	0	4.2	<.01	0.01	4.0	<.03

* T-test between groups (nonconsumers and consumers)

** This rate is heavily increased by a patient who admits selling soft drugs daily (i.e., 180 times in six months)

In sum, the data consistently suggest that selling of heroin can successfully be reduced to a very large extent by drug substitution.

The question is how this might affect the recruitment of new users. According to conventional criminological wisdom, any arrested drug dealer will immediately be replaced by a new one (Blumstein, 1986). Even if this may be true, the question remains of how the "loss" of addicted users as sellers of drugs on the streets and outside urban areas might affect supply lines and, especially, the recruitment of new users.

Over the last 15 years or so, the organization of drug distribution systems in Switzerland and other continental countries has undergone a special kind of differentiation. While gangs from Eastern Europe have taken over import and wholesale, the small retail business on the streets tended to remain in the hands of local addicts who sold the substance to their "friends." They also tended to recruit new users through their friendship networks. This pattern matches the results of American research (Hawkins et al., 1995), suggesting that drug-using peers are among the strongest predictors of substance use among youth. Although no recent information is available on this issue in Switzerland, user-dealers seem to play a significant role in the initiation of teenagers into drug use.

Thus, by losing this special "workforce," foreign and international traffickers may face some problems in maintaining the recruitment of new users at former levels. Although they tend to be highly sophisticated in the importation of large quantities at low prices, to date they have had great difficulty in gaining access to new and occasional users. In fact, the number of regular heroin users (prevalence rates) seems to have remained remarkably stable over the last years in all age groups. This conclusion derives from data of the Swiss Health Survey (OFSP, 1998) that suggest stable rates of heroin users, some increase of cocaine use, and a substantial increase of marijuana smoking. Estimates based on police contacts arrived at very similar conclusions (Estermann, 1998). Nor does the drop in drug-related fatalities from 419 (in 1992) to 209 (in 1998) point to a contrary trend in illicit drug use (Office Federal de la Police [OFP], 1999).

Thus, the idea that lower prices may automatically attract new consumers into the market (see Hawkins et al., 1995, concerning American research) may be somewhat simplistic and neglect the crucial role of distribution chains. In fact, such networks are no less crucial in stimulating sales of commodities in legal markets. Simultaneously, the stability of the number of regular heroin users in Switzerland invalidates occasional claims that heroin prescription is "sending the wrong message" to young people, and that it will ultimately increase the number of juvenile drug users (on such claims, see also MacCoun, 1998).

Anecdotal accounts from police officers in Zurich suggest that a few changes in distribution networks might have taken place recently. Dealers are no longer operating in the streets but in apartments. The contacts are being established through addicts, often of Swiss background, who look out for clients in the streets, but who no longer sell drugs themselves.⁶ This kind of distribution may work well in urban areas with established users, but it may be less effective in rural areas. These contain significant proportions of the Swiss population, and many users originate from them.

In sum, drugs like heroin might become less easily available to casual or novice users or to those who otherwise might wish to experiment out of curiosity. If this should hold true, heroin substitution might become not only a strategy of harm reduction, but contribute to reducing the extent of the drug problem.

CONCLUSIONS AND NEW PRIORITIES FOR THE RESEARCH AGENDA

The Swiss heroin prescription program was targeted at hard-core drug users with very well established heroin habits. These people were heavily engaged in both drug dealing and other forms of crime. They also served as a link between importers, few of whom were Swiss, and the — primarily Swiss — users. As these hard-core users found a steady, legal means for addressing their addiction, they reduced their illicit drug use. This reduced their need to deal in heroin and engage in other criminal activities. Thus, the program had three effects on the drug market:

- It substantially reduced the consumption among the heaviest users, and this reduction in demand affected the viability of the market.
- It reduced levels of other criminal activity associated with the market.
- By removing local addicts and dealers, Swiss casual users found it difficult to make contact with sellers.

So far, very little is known about habits of consumption, ways of recruitment and initiation, and distribution networks. Therefore, one future research priority should be to look more carefully into these factors in order to anticipate potential effects of substitution programs on drug markets. Another priority should be the study of market responses to reduced drug prices. How has the market absorbed the tremendous drop in drug prices in many Western countries? How did trafficking organizations manage the increased internal strain

and conflict? Eventually, did some traditional organizations (such as Italian and Turkish mafias) leave this market to new ones, e.g., from Albania, for reasons related to insufficient profitability? Or, as recent research suggests (Nett, unpublished), did Turks lose their market position because more and more of their local offspring became addicted themselves?



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NOTES

1. Estimates of the number of regular hard-drug users oscillate around 30,000 (Reuband 1998; OFSP 1997).
2. The details of heroin substitution programs in Switzerland have been reported in a number of publications available in English (Uchtenhagen et al., 1999; Killias and Rabasa 1998; Uchtenhagen 1997a; Killias and Uchtenhagen 1996); therefore, only a few essential characteristics of this project are given here.
3. A medical evaluation at the start of the program established that around 20% of the patients were in a bad physical condition and around 40% in bad psychological condition. 16% were found to test positive for HIV, 70% suffered hepatitis A infections, 74% suffered hepatitis B infections and 83% suffered hepatitis C infections (Uchtenhagen 1997b: 54-57).
4. At the time of data collection in the different police forces, 604 patients had been treated for at least six months, but only 108 of them had been treated for at least 24 months (see Ns in Tables 1 and 2).
5. The authors are much indebted to Lt. N. Klossner of the Zurich City police for having provided information on recent changes in drug market.
6. This "job" is certainly less rewarding than selling drugs. This trend illustrates how dealers' organizations try to straighten supply lines (and control costs of distribution) by eliminating addicts as dealers in the streets.