

# Can Heroin Maintenance Help Baltimore?

What Baltimore can learn from the experience of other countries.

BY PETER REUTER

School of Public Policy and  
Department of Criminology  
University of Maryland, College Park

• • •

PUBLISHED BY  
The Abell Foundation  
111 S. Calvert Street, Suite 2300  
Baltimore, Maryland 21202  
[www.abell.org](http://www.abell.org)

• • •

JANUARY 2009

---

# Table of Contents

· Executive Summary .....1

· Introduction .....8

· Historical Background .....9

· Recent Developments in Other Countries .....10

· The Heroin Problem in Baltimore City .....30

· Policy Analysis .....32

· References .....37

· Appendix .....40

· About Peter Reuter .....41

· Endnotes .....42

---

# Executive Summary

Baltimore City in particular has been adversely affected by the problem of heroin addiction. Whether measured by the number of heroin-related deaths per capita, heroin treatment admissions, or HIV related to heroin injecting, Baltimore City has for decades been the leading or close to the leading city in the United States. Even the massive expansion of Baltimore City's treatment programs that has occurred since 1995 has failed to rid the city of the problem.

Given that tougher enforcement and greater treatment provisions have not managed to make a large dent in the harm that heroin causes Baltimore City, there is a continuing desire to consider more radical solutions. In November 2007, the Baltimore City Council once again considered a bill proposing the legalization of drugs<sup>1</sup>, hardly a realistic option given the federal government's views on, and role in, drug policy.

There is, however, a less radical, though still bold, innovation that has received attention from time to time in Baltimore City: heroin maintenance. Under this option, heroin users who have tried and failed in other kinds of treatment, including methadone maintenance, are provided heroin in the context of a medically supervised facility.<sup>2</sup> The assumption is that if an addict has cheap access to heroin in safe conditions, many of the harms of the drug will disappear; the risk of overdose will become minimal, and the addict will no longer have to commit numerous property crimes, or sell to other users, in order to finance an extremely expensive habit.

There are many arguments against this assumption, involving both principle and pragmatic considerations. For example, in the heroin maintenance program, the government appears simply to be providing addicts with what they want rather than curing them of a dependence that prevents them from leading productive and socially engaged lives. Others assert that these programs lead to an increase in heroin initiation because they make the consequences less harmful. Nonetheless, a small but growing number of Western nations are experimenting with heroin maintenance. In two European countries, the Netherlands and Switzerland, heroin maintenance is now a routine treatment option, available to most heroin addicts, though taken up by few. Germany, the United Kingdom, and Spain are seriously considering the option. Canada has experimented with heroin maintenance in two cities, Vancouver and Montreal. The treatment evaluations, which are of varying quality, generally show positive results; none show negative results.

The purpose of this study is to provide interested citizens, specifically in Baltimore City but elsewhere in the U.S. as well, with a summary of what is known about heroin maintenance as of early 2008. The study does not make recommendations as to whether Baltimore should adopt this option, which would require a great deal of legal

---

change, because the issue involves important and controversial value judgments. However, the study does aim to allow citizens to develop an informed position by presenting an examination of the concerns that have been raised about the option.

*Switzerland*

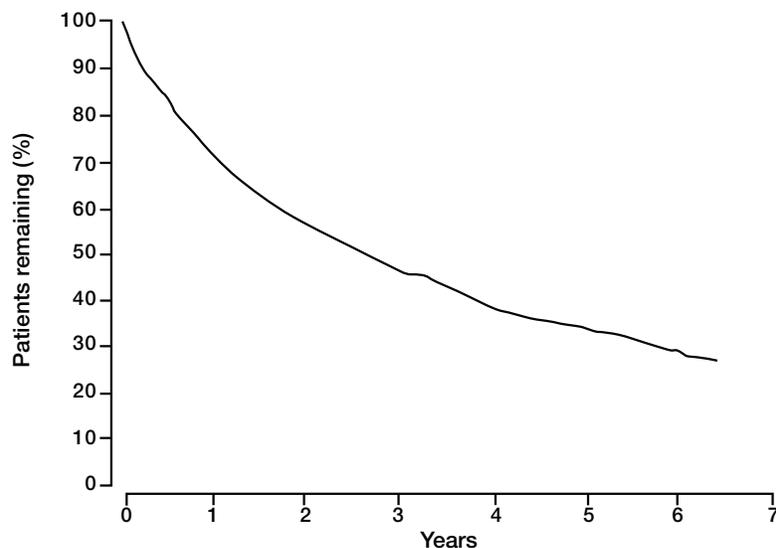
There are now 23 facilities in Switzerland providing heroin-assisted treatment (HAT); two are located in prisons. The total number of clients in treatment has stabilized at about 1200, constituting less than 5 percent of the estimated heroin-addict population. The total number of places available for treatment has been capped, but there is no indication of substantial waiting lines.

A decision to allow addicts to choose their own dose was critical. It removed any incentive to supplement the clinic provision with black-market purchases. A patient could receive heroin three times daily, 365 days of the year; very few now receive it more than twice daily. The average daily dose stabilized at 500 to 600 milligrams of pure heroin, a massive amount by the standards of U.S. street addicts.

The programs, by design, offer a very sterile, indeed clinical, environment. Operators make every effort to reduce this experience to medicine rather than recreation. Patients must turn up on time, take the drug promptly, and leave the premises. There is to be no congregating and socializing. For example, in one facility there are few chairs in the waiting room; the aim is to move patients in and out as soon as they have recovered from their dose. They are expected, here and elsewhere, to leave within 20 minutes of taking their heroin.

The patient population is aging and, mostly, very troubled. They have long-standing problems in all aspects of their personal lives and little prospect of being able to improve their conditions.

Perhaps the most significant evaluation of the Swiss experience appeared in a 2001 issue of *The Lancet*, a leading British medical research journal. The study followed 2,000 addicts admitted to HAT over a six-year period. One thousand were discharged for some reason but the retention rate was high; even at the six-year mark nearly 30 percent remained in the program.



**Figure 4: Proportion of Patients in Treatment Over Time, Switzerland**

Of particular note was the analysis of reasons for discharge; more than 60 percent of those who left HAT did so in order to take up another treatment option. Most of those seeking other treatment went into a methadone maintenance program (60 percent) but almost 40 percent went into an abstinence program.

What these data suggest is that heroin maintenance is not a *terminal* state, as most critics have (plausibly) alleged, but that it is mostly a *transitional* state. The Swiss experience suggests that the transition might take a few years and that some will stay in heroin assisted therapy. Nonetheless, it does potentially change assessments of the desirability of the program if perhaps one-third of those who enter have transitioned to other treatment within a few years.

### *The Netherlands*

The Netherlands has a well-deserved reputation for innovation and clarity in drug policy. Best known for its tolerance of small cannabis sales from coffee shops over the last 25 years, the Dutch government has been extremely explicit in its implementation of a harm-reduction approach to the drug problem.

The Netherlands experienced one of the first heroin epidemics in Europe. A distinctive feature of Dutch heroin use is that the drug is mostly smoked rather than injected and this has been true since the early days of the epidemic. In 2001, the estimated number of heroin-dependent persons was between 28,000 and 30,000—essentially unchanged from the 1993 estimate; this per capita rate (two per thousand) appears to be below estimates for the U.S. in 2000.<sup>3</sup> Since the 1980s, the heroin-using population has aged substantially, as in Switzerland and the United States, reflecting the low rate of initiation. In the Netherlands, methadone is widely available from general practitioners. It is estimated that in 2001, about 50 percent of all Dutch heroin addicts were enrolled in some methadone program.

A trial of HAT was conducted from 1998 to 2001. More sophisticated in design than the Swiss trials conducted four years earlier, it also found higher retention in heroin

---

treatment and better outcomes with respect to both crime and health. The national government plans to increase enrollment to about 815, on the way to an estimated total demand of 1,000 to 1,500. The figure of 1,000 comes from the findings of the committee set up to implement heroin treatment. The 815 figure is a consequence of some municipalities not taking up the local option. But there has been considerable initial enthusiasm by cities for this program, even though they have to provide some of the funds. Until about 2005, financing of methadone maintenance was a local government responsibility; a single budget covered both shelter provision and addiction treatment, leading to unattractive competition between these programs. Addiction treatment was not covered either by public or private insurance; now it is covered by public insurance.

***Vancouver***

Canada, with a population of 31 million, is estimated to have between 80,000 and 125,000 injecting drug users, representing a population rate not much different from that in the United States. Vancouver, with a population of 580,000 and a metropolitan area population of 2.2 million, has been the city most affected by heroin use for more than 50 years.

By a variety of indicators Vancouver's heroin problem has been declining. For example, the total number of deaths related to the use of illicit drugs has fallen substantially since the late 1990s. Whereas the average number of drug-related deaths was 160 between 1996 and 1998, it fell to almost one-third that level between 2003 and 2005.

Vancouver has had three successive mayors who support drug policy innovations. Vancouver's heroin problem has a very specific and visible face, associated with a 15 to 20 block area near the center of town. This was the site of an experiment (which was also conducted in Montreal).

The initial results of the study were published in October 2008; final results are not available. Primary outcomes presented were the retention rates at 12 months (87.8 percent for the experimental group vs. 54.1 percent for the control group receiving methadone) and the percentages that "responded" positively to treatment (67.0 percent vs. 47.6 percent, respectively). There were also greater reductions in expenditures on illegal drugs by the experimental group, as well as fewer days of criminal activity; both differences were statistically significant. There were a minimal number of adverse incidents in the facility, of which few were related to injecting as opposed to the pre-existing problems of the patients.

**Policy Analysis for Baltimore City**

The table below summarizes the three major studies to date, including the one recently completed in Germany. All evaluations so far have been positive. Retention





---

substantial reductions in crime and various other problems that greatly trouble the city. That is enough to make a debate on the matter worthwhile.

**Acknowledgements**

I was fortunate to receive cooperation from many individuals in all four sites:

**The Netherlands** – At the Ministry of Health, Judith Verlind, Ingrid Sneekes, Wil De Zwart, and Marcel de Kort gave useful advice. At the programs Renata Bok (Utrecht) Ineke Huijsman (Rotterdam), Peter Blanken (Rotterdam), and Elska de Bock (Rotterdam) were generous with their time.

**Switzerland** – Diane Steber-Buchli of the federal office of public health provided initial introductions to program operators. Her colleague, Sandra Wüthrich, gave a helpful overview of the program nationally. Individual program operators were generous with their time; these included Markus Herold (Zurich), Julius Maaskola (Zurich), Ariane Schweizer (Thun), Christoph Burki (Bern), and Hannes Strasser (Basel).

**Vancouver** – Donald McPherson (Vancouver drug coordinator) provided both a good overview of the development of programs and introductions to the local participants. Dan Small (the Portland Group) guided me around the area targeted for the intervention. At the University Hospital, Martin Schechter, Dave Marsh, Michael Krausze, and Candice Gurty all provided valuable information.

**Baltimore** – At the Maryland Alcohol and Drug Agency, William Rusinko and Steve Bocian provided data on treatment admissions. Adam Brickner and Susan Swanton gave helpful interviews.

I thank Sara Betsinger for research assistance.

---

# Introduction

Baltimore, in particular, has been adversely affected by heroin. Whether measured by the number of heroin-related deaths per capita, heroin treatment admissions, or HIV related to heroin injecting, Baltimore City has for decades been either the leading city or close to the leading city in the United States. Even the massive expansion of Baltimore City's treatment programs that has occurred since 1995 has failed to rid the city of the problem.

Given that tougher enforcement and greater treatment provisions have not managed to make a large dent in the harm that heroin causes Baltimore, there is a continuing desire to consider more radical solutions. In November 2007, the city council once again considered a bill proposing the legalization of drugs<sup>4</sup>, hardly a realistic option given the federal government's views on, and role in, drug policy.

There is, however, a less radical, though still bold, innovation that has received attention from time to time in Baltimore City, namely heroin maintenance. Under this option, heroin users who have tried and failed in other kinds of treatment, including methadone maintenance, are provided heroin in the context of a medically supervised facility.<sup>5</sup> The assumption is that if an addict has cheap access to heroin in safe conditions, many of the harms of the drug will disappear; the risk of overdose will become minimal and the addict will no longer have to commit property crimes, or sell to other users, in order to finance an extremely expensive habit.

There are many arguments against this, involving both principle and pragmatic considerations. For example, the government appears simply to be providing addicts with what they want rather than curing them of a dependence that prevents them from leading productive and socially engaged lives. Others assert that these programs will lead to an increase in heroin initiation, by making the consequences less harmful. Nonetheless, a small but growing number of Western nations are experimenting with heroin maintenance. In two European countries, the Netherlands and Switzerland, heroin maintenance is now a routine treatment option, available to most heroin addicts, though taken up by few. Germany, the United Kingdom, and Spain are seriously considering the option. Canada has experimented with heroin maintenance in two cities, Vancouver and Montreal. The treatment evaluations, which are of varying quality, generally show positive results; none show negative results.

The purpose of this study is to provide interested citizens, specifically in Baltimore but elsewhere in the U.S. as well, with a summary of what is known about heroin maintenance as of early 2008. It does not make recommendations as to whether Baltimore should adopt this option, which would require a great deal of legal change, because the issue involves important and controversial value judgments. However the study does aim to allow citizens to develop an informed position by an examination of the concerns that have been raised about the option.

---

# Historical Background<sup>6</sup>

Heroin maintenance is long-contested territory. Indeed, a key Supreme Court decision in 1919 concerning the legitimacy of allowing doctors to prescribe heroin to their addicted patients (*Webb vs. U.S.*)<sup>7</sup> was critical to the establishment of the current system following the 1914 Harrison Act. British doctors have long been allowed to maintain heroin-addicted patients on heroin<sup>8</sup> if they believe it is an appropriate treatment. Until about 1967, maintenance was in fact the way in which most of the small number of heroin addicts in Britain were treated. Once methadone became available, heroin maintenance dropped precipitously as a share of all treatment episodes.

Even in the United States discussion of this option has emerged from time to time over the last 50 years. The American Medical Association and American Bar Association both endorsed this possibility in 1957. Nothing came of that proposal, which arrived at a time when heroin was not at all prominent and the general attitude toward illegal drugs was highly punitive. After the heroin epidemic of the late 1960s had begun, the Vera Institute, a prominent criminal justice research and advocacy organization, promoted the idea of an experiment in New York City in 1971. This was vehemently criticized from all sides, right and left, and was soon abandoned.

The option was once again discussed in the 1990s. In 1998, David Vlahov, a professor at the Johns Hopkins School of Public Health, proposed to undertake a trial. The usual chorus of disapproval was instantaneous. Maryland's democratic governor said: "It doesn't make any sense. It sends totally the wrong signal." The lieutenant governor expanded on this slightly. "It's much better to tell young people that heroin is bad. This undermines the whole effort." Even former Mayor Kurt Schmoke, a leader in liberal drug policy, distanced himself from the proposal and censured his health commissioner for endorsing it. It was also reported that "many addiction experts say funding for traditional drug treatment falls far short of the demand, and heroin maintenance is a dubious distraction from proven remedies for drug abuse."<sup>9</sup>

---

# Recent Developments in Other Countries

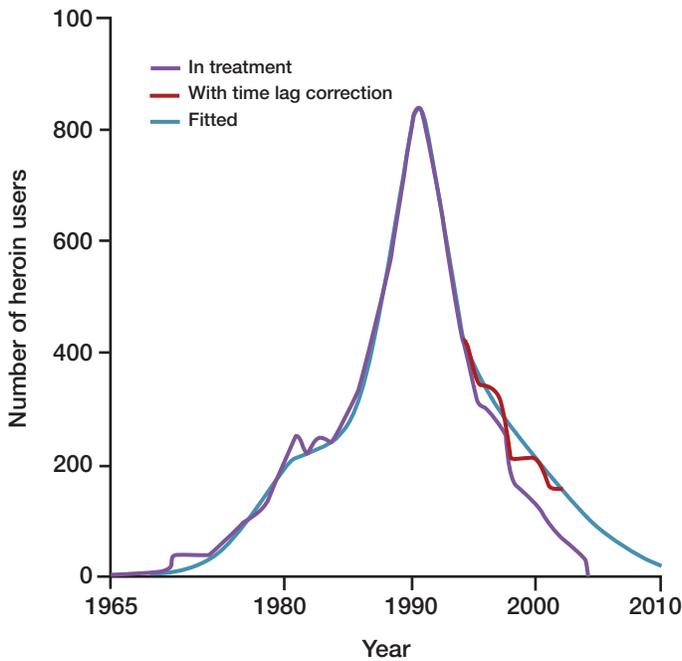
In 1994, HAT reignited interest in heroin maintenance, which led to experiments in at least five other nations: Britain, Canada, Germany, the Netherlands, and Spain (see Fischer, et al., 2007 for a brief description of the different experiments). This type of program is now implemented in the Netherlands and Switzerland. Germany, having completed its experiments successfully, has suspended implementation for political reasons. The first Spanish experiment was treated by the government as inconclusive and the second, which is more limited, has not been concluded. The initial Canadian results were published in October 2008. The British experiment is still underway.

## *Switzerland*

To understand the Swiss experience with HAT requires a knowledge of Switzerland's treatment system more generally and of the epidemiology of heroin use in that nation. It is estimated that Switzerland had approximately 30,000 heroin addicts in 1999 (Maag, 2003); in per capita terms this is a very similar figure to that in the United States at the beginning of the century (three to four per thousand persons).<sup>10</sup> The estimates, which come from a variety of sources and have a good deal of uncertainty, suggest that there has been a modest decline since the middle of the 1990s. This represents a common phenomenon in Western Europe and the United States, namely the aging of the cohort of heroin addicts generated by a relatively brief epidemic of heroin initiation.<sup>11</sup> In Switzerland that epidemic occurred between roughly 1985 and 1995, as indicated in Figure 1, which gives an estimate of the flow of new heroin users in Zurich, the country's largest city with a population of 350,000.<sup>12</sup> In the peak year of 1990, more than 800 individuals (who were later in treatment) started using heroin, compared to less than half that number five years before and five years after. By 2000, the number of new initiates had fallen to about 200.

Since 1995, relatively few individuals have begun heroin use in Switzerland because heroin addiction is a long-lived phenomenon. This record implies that the population of dependent users will age and slowly get smaller over the following decades. The aging of the addict population can be seen in the treatment populations, which became about nine months older each year.<sup>13</sup>

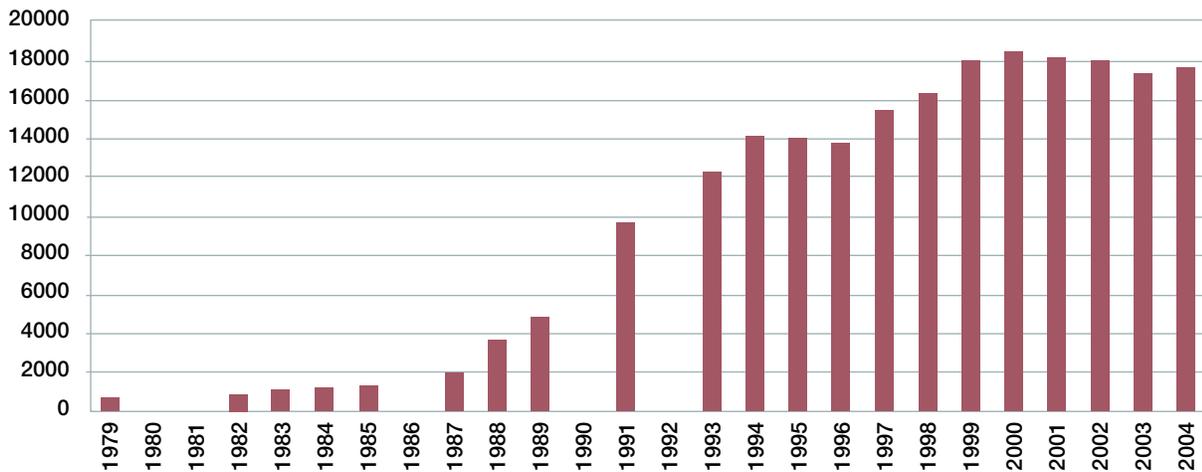
Methadone enrollment in Switzerland (see Figure 2) has been between 16,000 and 18,000 since 1999, constituting about 60 percent of the heroin addict population, one of the highest percentages in the world. Since 1991, any physician can prescribe methadone or buprenorphine, and all long-term residents have mandatory health insurance that covers the service. The only qualifying condition for entry into substitution treatment is heroin dependence.



**Figure 1: Incidence of regular heroin use in the methadone case register of the canton of Zurich, March 2005**

Source: Nordt and Stobler, 2006

Some methadone clients are in what is called low- threshold programs, in which the patients receive very low levels of methadone (20 to 30 milligrams per day) and few other services. The intent is to reduce some of the adverse consequences of heroin and keep the addict in contact with the treatment system.<sup>14</sup> A modest number are in other treatment programs, such as residential facilities and therapeutic communities.



**Figure 2 Number of methadone clients in Switzerland 1979-2004**

Source: Swiss Office of Public Health

---

### **Heroin Assisted Treatment**

Faced with a growing and visible heroin problem in the 1980s, local governments in Switzerland experimented with various ways of reducing three heroin-related problems: heroin dependence, the spread of HIV associated with injection drug use, and the disorder that surrounded street markets that sprang up in some cities, most prominently Zurich. The Zurich government's experiment with the Platzspitz, a park near the main train station in which small quantities of drugs could be sold and used without police interference, attracted a great deal of critical attention around the world. The experiment led to an influx of drug users from outside the city and did not contain the disorder, so the park was closed in 1991.

The decision to launch the heroin trials in 1994 was made after very public consultations at the highest levels. An unusual summit meeting was held, at which the Swiss president and the heads of the cantonal governments<sup>15</sup> approved an experiment to test whether heroin maintenance would reduce heroin problems. Public opinion was strongly supportive. In a 1991 poll, 72 percent expressed approval of controlled prescriptions of heroin (Gutzwiller and Uchtenhagen, 1997). The experiment was widely discussed in the media before implementation. An elaborate governance structure was established, including very detailed ethical scrutiny by regional ethics officers (Uchtenhagen, et al., 1999). As an example of the care that was taken to protect public health, each enrollee was required to surrender his driver's license, thus reducing the risk of driving while heroin-intoxicated. Similarly, it was decided that once the government provided heroin addicts with the drug, it incurred a continuing obligation to maintain those addicts as long as they sought heroin.

Participants in the trials were required to be at least 20 years old, have undergone two years of intravenous injecting, and have failed at two other treatment attempts. These are hardly very tight screens. In fact, most of those admitted had extensive careers both in heroin addiction and in treatment. For example, at the Geneva site, the average age of participants was 33, with 12 years of injecting heroin and eight prior treatment episodes.

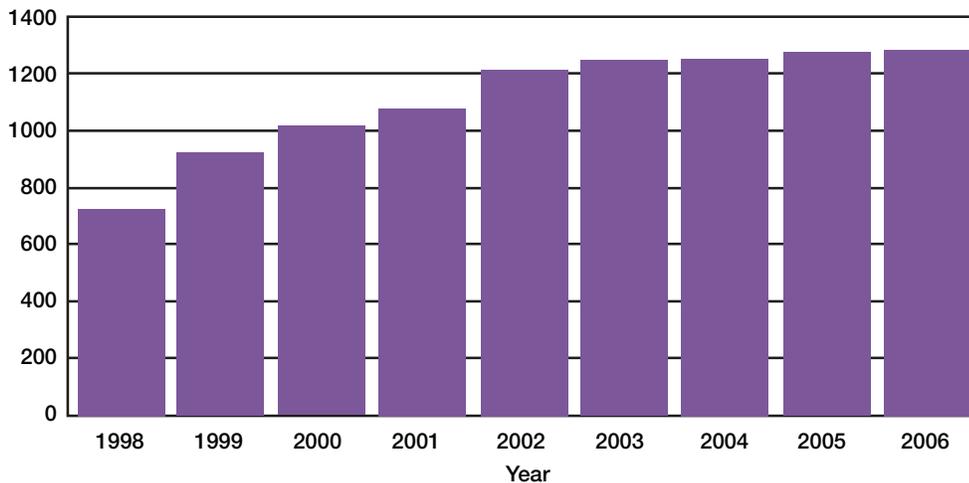
A decision to allow addicts to choose their own dose was critical. It removed any incentive to supplement the clinic provision with black-market purchases and eliminated what had been an important source of tension in the relationship with clinic personnel in the British practice. A patient could receive heroin three times daily, 365 days a year; some patients were permitted to inject more than once in a single session. The average daily dose stabilized at 500 to 600 milligrams of pure heroin, a massive amount by the standards of U.S. street addicts.<sup>16</sup>

The patient self-injected with equipment prepared by the staff, which could provide advice about injecting practices while they supervised the injection. A daily fee of 15 Swiss Francs (then about \$10) was charged to participants, many of whom paid out of

their state welfare income. No heroin could be taken off the premises, minimizing the risk of leakage into the black market. Initially, enrollment in the trials lagged behind schedule, but after the first year, enthusiasm among local officials increased sharply; consequently, the trials ended up enlisting more than the initial targets and in a greater variety of settings than expected. Small towns (e.g., St. Gallen) and prisons even volunteered to be sites and were able to enroll patients. Nonetheless, some sites, such as Geneva, were never able to reach their enrollment targets (Perneger, et al., 1998).

The trials were declared a success because participants showed marked improvement in social functioning. There has been extensive criticism of the evaluation on which this decision was based (e.g., Farrell and Hall, 1998). The lack of a control group is the central concern of the critics. Nonetheless, HAT became a routine treatment option available to any experienced heroin user who sought it.

There are now 23 facilities in Switzerland providing heroin assisted treatment; two of them are located in prisons. The total number of clients in treatment has stabilized at about 1200 (see Figure 3), constituting less than 5 percent of the estimated heroin addict population. The total number of places available for treatment has been capped but there is no indication of substantial waiting lines.



**Figure 3: Enrollment in Heroin Assisted Treatment, Switzerland 1998-2006**

---

· **Program Operation**<sup>17</sup>

· Before giving summary impressions of the programs as a group, here is a more  
· detailed description of one particular urban program.

· *Program One*

· This program was originally set up for women involved in an open drug scene and  
· then expanded to include their partners; it is now open to anyone but remains about  
· half female, an unusually high ratio.

· It is housed in a neat building in a middle-class neighborhood near the train station.  
· Downstairs is a bit shabby but upstairs the facility has three pleasant-looking  
· physicians' offices. There has been little trouble with the neighbors. The occasional  
· complaints about disturbances in the neighboring café may reflect problems of  
· a nearby social service center for immigrants rather than the program's patients.

· The staff director is a young psychiatrist; included on staff are two physicians (one  
· gynecologist), two psychiatrists, two psychologists, one social worker, plus front office  
· staff (physician's assistant, nurse, medical students, etc.). The director thought that  
· it was hard to maintain enthusiasm with such an intractable population and that  
· staff members would burn out. The center provides the same services as a general  
· practitioner's office, only without X-ray facilities. The services are provided only  
· during the dispensing time.

· Admission procedures take two to three weeks, which is seen by some applicants as  
· a serious barrier. This is the time for staff to deal with paper work, checking prior  
· contacts with the system, etc. It is in sharp contrast with methadone programs where  
· the paper work is dealt with in 20 minutes.

· The program has 130 patients. Only one-third are employed (full- or part-time) and  
· few of these are in good jobs. Another one-third receives a pension from the state.  
· All are from the canton (equivalent to a U.S. county in the sense that it encompasses  
· suburbs); the director thought the center might treat three patients who live  
· elsewhere but work in the canton. Ten percent to 15 percent are foreigners living  
· in the canton; the requirement for the center is residency, not citizenship. About  
· two-thirds have dual diagnosis and many are on medications for those underlying  
· problems. About 70 percent have hepatitis C (mostly still asymptomatic) and about  
· 30 percent are HIV positive.

· Each patient receives counseling at least once a month for a wide variety of problems.  
· For example, one has a phobia about opening mail because of fear of what is in  
· the letter. The patient brings letters to the clinic for the social worker to open in the  
· client's presence.

---

Between one-third and one-half of the patients choose to take methadone as well as heroin. This option allows them to take the heroin just once daily. The methadone can be taken out of the clinic. Though some patients try to taper their dosage, their daily heroin consumption seems to be fairly stable now.

Most of the cost is covered by state health insurance. The patient pays 7 to 9 SFr (approximately \$6-\$8) per day; about one-third even have this part paid by their pension from the state.

The program is privately operated, subject only to federal regulation. For example, the clinic is required to test urine, even though patients are perfectly willing to tell the providers what they are using because they will not be punished for reporting use of prohibited substances. The testing does not include cannabis.

Patient turnover is slight. The director thought that 12 to 15 clients (about 10 percent) left each year. In the director's two-and-a-half years at the program only about 20 had tried abstinence.

The injecting room has eight booths, plus an observation stool for a supervisor who *inter alia* checks that no one walks away with heroin. Theft is not motivated so much by re-selling as for the opportunity to make a cocktail with cocaine outside of the clinic. Attempted theft happens very rarely. Those who persist are sanctioned by being offered only methadone for a week. The observer also tries to help with safe injecting practices (e.g., avoiding large veins) but the director is pessimistic that this has much effect.

Doses are 100 milligrams to 200 milligrams of pure heroin. If a patient misses one day there is no sanction. After two days absence, the dose is cut by 25 percent, three days by 50 percent and after four days by 75 percent. This is not a punitive regime but reflects concern about reduced tolerance.

The facility is open 7:30 a.m. to 9:30 a.m., 11:45 a.m. to 1:15 p.m., and 5:00 p.m. to 8:30 p.m. Patients are allowed to have two injections in any session but have to wait at least a half-hour between injections. About one-third take their heroin orally; they consume much larger quantities (up to 1.8 grams per day) with doses as high as 700 milligrams. Many require a couple of minutes to take their drug, but those who are already high may take 15 minutes, including some time nodding off.

All patients are cigarette smokers; preventing them from smoking in the facility has been a bit of a problem because those who want to linger now have to do it outside. The heroin is stored in a huge safe. The alarm system occasionally goes off, triggering rapid police response, but there is no indication so far that any effort has been made to steal the heroin.

---

When patients go to prison they may continue to receive heroin, but only three to four are imprisoned each year. One young patient neglected himself in early treatment and went to prison; he responded well to the discipline and cleaned himself up. He continued to do well for a while after release but then deteriorated again. The director suspects that he sought to get imprisoned again in order to clean himself up and may even have committed petty crimes for that purpose.

When patients go on vacation, the clinic provides methadone for the travel period, along with a list of countries that will allow them to carry the drug with a prescription. A patient recently had his drugs confiscated by Spanish police and had to return home as a consequence.

#### **Programs Nationally**

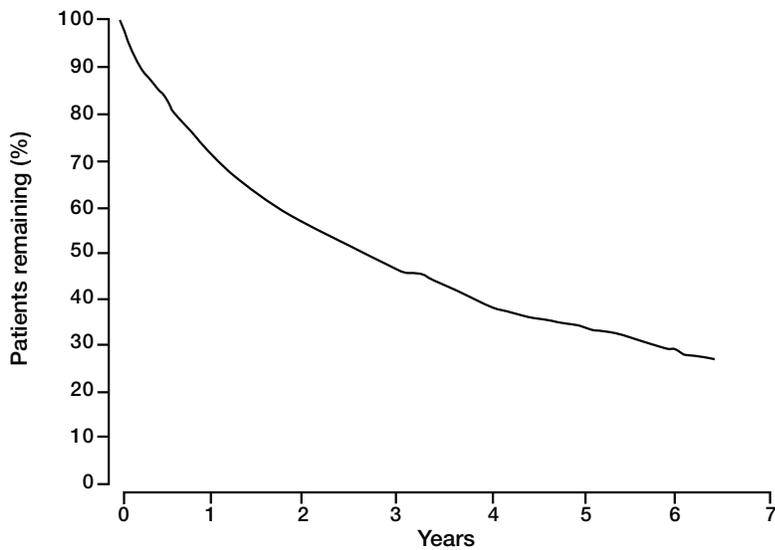
Most of the Swiss facilities began by offering three time slots for injections, including one in the middle of the day. However, there has been decreasing demand for that slot. Program One is unusual. Most facilities now offer only two slots: one early in the day (8:00 a.m. to 10:00 a.m.) and one at the end of the day (5:00 p.m. to 7:00 p.m.). Patients who have a job are given priority at the beginning of the day, so that they can go on to their employment. The programs are all open seven days per week.

The programs, by design, offer a very sterile, indeed clinical, environment. Operators make every effort to reduce this process to medicine rather than recreation. Patients must turn up on time, take the drug promptly, and leave the premises. There is to be no congregating and socializing. For example, in one facility there are few chairs in the waiting room; the aim is to move patients on as soon as they have recovered from their dose. They are expected, here and elsewhere, to leave within 20 minutes of taking their heroin.

The patient population is aging and, mostly, very troubled. They have long-standing problems in all aspects of their personal lives and little prospect of being able to improve their conditions.

#### **Patient Outcomes**

Perhaps the most significant evaluation of the Swiss experience appeared four years after the formal trials themselves were completed. In 2001, *The Lancet*, a leading British medical research journal, published an article by Jurgen Rehm and colleagues that was based on follow-up of 2,000 persons admitted to HAT over a six-year period. More than 1,000 clients were discharged for some reason but the retention rate was high; even at the six-year mark, nearly 30 percent remained in the program (see Figure 4).



**Figure 4: Proportion of Patients in Treatment over Time**

Source: *Rehm, et al., 2001*

Of particular note was the analysis of reasons for discharge. Rehm, et al. found that more than 60 percent of those who left HAT did so in order to take up another treatment option; these findings are reproduced in Table 1. Most of those seeking other treatment went into a methadone maintenance program (60 percent), but almost 40 percent went into an abstinence program. The share of those discharged going into methadone treatment increased with the length of time to discharge. For example, those who were discharged after three years were almost as likely to seek methadone treatment (29 percent) as abstinence treatment (38 percent), and those who left in less than four months were only one-quarter as likely to seek methadone treatment (9 percent) as abstinence treatment (35 percent).

**Table 1. Reasons for leaving HAT, by duration of treatment**

Reason for discharge	Time to discharge				Total
	≤ 4 months	>4months to 1 year	>1 year to 3 years	>3 years	
Abstinence treatment	21 (9%)	74 (22%)	82 (27%)	47 (29%)	224 (22%)
Methadone-maintenance treatment	79 (35%)	128 (38%)	112 (37%)	60 (38%)	379 (37%)
Other treatment	3 (1%)	3 (1%)	14 (5%)	8 (5%)	28 (3%)
Death	4 (2%)	12 (4%)	10 (3%)	4 (3%)	30 (3%)
Violence or illegal trafficking	20 (9%)	32 (9%)	25 (8%)	10 (6%)	87 (8%)
Imprisonment	7 (3%)	15 (4%)	6 (2%)	6 (4%)	34 (3%)
Health reasons	12 (5%)	9 (3%)	12 (4%)	8 (5%)	41 (4%)
Treatment break off, refusal, lack of compliance	68 (30%)	51 (15%)	29 (9%)	6 (4%)	154 (15%)
Other	11 (5%)	15 (4%)	17 (6%)	11 (7%)	54 (5%)
Total	225	339	307	160	1031

Data are number of patients (column %) unless underwise indicated. Number of missing values=144.

: Source: *Rehm, et al., 2001*

:  
: What these data suggest is that heroin maintenance is not a *terminal* state, as  
: most critics have (plausibly) alleged, but that it is mostly a *transitional* state. That  
: indeed was the contention of the Vera Institute when it proposed a trial of heroin  
: maintenance for New York City in the early 1970s; addicts would only receive  
: heroin for a period of a few months before they moved to other programs. The  
: Swiss experience suggests that the transition might take a few years and that not  
: all participants will make the transition. Nonetheless, it does potentially change  
: assessments of the desirability of the program if perhaps one-third of those who  
: enter have transitioned to other treatment within a few years.<sup>18</sup>

:  
: Unfortunately, there are no studies of the outcomes of the former HAT patients when  
: they enter the other treatment programs. One conjecture is that having discovered  
: that the central problem of their lives was not an inability to obtain heroin, but  
: getting rid of the dependence, they perform better in treatment programs than they  
: would have otherwise. However, this is an empirical question, not to be resolved  
: through amateur (or even expert) speculation.

:  
: The central question is why HAT attracts such a small share of all Swiss heroin  
: addicts. In no year have more than 1,300 patients enrolled. Even taking into account  
: that a number have dropped out to try other treatment programs, it is unlikely that  
: as many as 10 percent of Switzerland's 30,000 heroin addicts have participated in the

---

program at any time. Why do so many resist the lures of essentially free heroin? This is discussed further in the Policy Analysis section.

***The Netherlands***

The Netherlands has a well-deserved reputation for innovation and clarity in drug policy. Best known for its tolerance of small cannabis sales from coffee shops over the last 25 years, the Dutch government has been extremely explicit in its implementation of a harm-reduction approach to the drug problem. For example the first sentence of an official summary of policy states: “Drug policy in the Netherlands aims to reduce demand for drugs, reduce the supply of drugs and the risks to drug users, their immediate surroundings and society.” (Ministry of Health Welfare and Sports, 2002). There is no reference to a “drug-free society.” The government is willing to implement a program that might increase drug use if the program will substantially reduce the adverse consequences of use at the individual level. Among the novel programs that it encourages is the testing of pills that are sold at dance clubs, on the basis that it will reduce the adverse consequences.

The Netherlands experienced one of the first heroin epidemics in Europe and already had a substantial heroin-dependent population by 1980, but the epidemic phase is long past. A distinctive feature of Dutch heroin use is that the drug is mostly smoked rather than injected and this has been true since the early days of the epidemic (Grund and Blanken, 1993). In 2006, 71 percent of heroin users in treatment (mostly methadone maintenance) reported that they smoked the drug (National Alcohol and Drugs Information System, 2007). In 2001, the estimated number of heroin-dependent persons was between 28,000 and 30,000—essentially unchanged from the 1993 estimate; this per capita rate (two per thousand) appears to be below estimates for the U.S. in 2000.<sup>19</sup> Since the 1980s, the heroin-using population has aged substantially, as in Switzerland and the United States, reflecting the low rate of initiation. In 1989, the median age of those in treatment in Amsterdam was 32; in 2002, the median age was 43 (National Drug Monitor, 2003). Heroin was the primary drug of abuse for 62 percent of patients admitted to treatment for the first time in 1994; that figure was down to 28 percent in 2005. The Netherlands has seen a sharp increase in cocaine use; for example, whereas cocaine was the primary drug of abuse for only 17 percent of patients admitted for the first time in 1994, the figure for 2005 was 35 percent.

In the Netherlands, methadone is widely available from general practitioners. It is estimated that in 2001, about 50 percent of all Dutch heroin addicts were enrolled in some methadone program (National Drug Monitor, 2003), though many of these are low-threshold programs primarily designed to ease continued heroin consumption and keep the user in contact with the treatment system. Buprenorphine, though permitted as a substitution drug, is hardly used at all.

---

Given the methodological criticisms of the Swiss trials, it was hardly surprising that the Netherlands launched its own experimental evaluation of heroin -assisted therapy; the principal results of the experiments can be found in van den Brink, et al., 2003. The Dutch experiments were very carefully designed to avoid the criticisms cast against the Swiss studies. Thus, there was a complex cross-over design intended to produce a strong comparison group. However, the trials did have an important structural weakness that only became obvious well after the experiment was launched. Because it limited participation to 12 months, there was no possibility of detecting the longer-term effects documented by Rehm and colleagues of a shifting from HAT to other kinds of treatment. After encountering some obstacles to post-experimental implementation during a period of political instability (Lemmens, 2003), the program has been implemented in six facilities with a total enrollment of about 450 in 2007.

Here are notes on one specific program.

**Program One**

The heroin program is located in a building on a side street that has primarily businesses, not shops. There is at least one apartment building nearby. A meeting with community and police is held every six weeks in an effort to deal with any problems. The community mostly uses this time to vent at the police, leaving the heroin facility managers as amused observers.

The program is primarily for heroin smokers. With a capacity of 70, it is now handling 85 patients until a new 70-patient unit can be established. Nineteen patients are injectors. The facility is open during three time periods: 8:00 a.m. to 11:00 a.m., 1:00 p.m. to 4:00 p.m., and 6:00 p.m. to 8:00 p.m. Most patients come only twice; only three patients come three times. The dosage for smokers and injectors is almost equal, about 550 milligrams per day.

Regulations require a doctor for three days per week for every 50 patients. In addition there should be seven full-time equivalency (FTE) nurses.

Most of the patients smoke crack as well as heroin, even though that is a violation of rules. The program is also operating a cocaine contingent management experiment. For the first negative urine sample (cocaine only), a patient gets 2 Euros; the payment goes up by 1 Euro for each of the next 15 negative urine samples, making the highest amount 16 Euros. The maximum weekly pay is 56 Euros. Originally, the payment was made in cash but a newspaper article on the subject, which suggested that the money was then being used to buy crack, changed the procedure. Now patients have to use it for an approved expenditure. The staff knows that this is a mere facade and that the money is fungible and can be used for any purpose.

---

These facilities operate very differently from those in Switzerland. Smokers have 45-minute sessions and these are very sociable. After the session, patients are required to spend a half-hour in the waiting room for observation before leaving the facility. Injectors also must linger, but obviously spend less time ingesting their drug.

Eligibility is demanding: To be admitted, patients must be over 25, be daily users of heroin in the previous 30 days, and not be doing well (“little improvement”) on a methadone dose of at least 50 milligrams daily. Few methadone maintenance clients in the Netherlands receive more than 60 milligrams (National Alcohol and Drug Information System, 2007). While in HAT they receive about 50 milligrams per day of methadone; the purpose is to reduce the euphoria associated with the heroin itself.

Smoking heroin is given to the patient in the form of a sachet, along with foil and other paraphernalia (even a lighter), in a plastic bag; it all must be returned in the same bag and disposed of by the nurse. The staff is constantly watching the patients, who may try to conceal some heroin and take it with them, perhaps to share with friends. Patients are not allowed to scratch their heads because they may be trying to conceal powder in their hair; staff may sometimes be too tough in enforcing this regulation.

There has been an effort to impose a work requirement for patients, such as street sweeping. The aim is to have them work 12 hours per week, for which they receive 20 Euros. Given that rent might take half their social welfare check, this is a substantial addition to discretionary income. The program also helps with housing. Only one patient is homeless; a number of others were homeless at program entry but are now orderly enough that they can manage to live in a room that the facility has found for them.

**Nationally**

The national government plans to increase enrollment to about 815, on its way to an estimated total demand of between 1,000 and 1,500 patients. The figure of 1,000 comes from the findings of the committee set up to implement heroin treatment. The 815 figure is a consequence of some municipalities not taking up the local option. But there has been considerable initial enthusiasm by cities for this program, even though they have to provide some of the funds. Until about 2005, financing of methadone maintenance was a local government responsibility; a single budget covered both shelter provision and addiction treatment, leading to unattractive competition between these programs. Addiction treatment was not covered either by public or private insurance, now it is covered by public insurance.

HAT (called just “heroin treatment” in the Netherlands) remains politically controversial. Parliament wants to be involved in the decisions about its expansion and continuation, and had to at least passively approve the inclusion of heroin in

---

the national pharmacopoeia, which permits reimbursement from health insurance. Although the opinion is favorable there continues to be conservative resistance; the Labor Party, for example, is more supportive than its coalition partner, the Christian Union.

Christian Democrats (CD) were long opposed to the program at the national level. That attitude changed after some local CD governments became involved in running HAT programs. They were impressed by how well the program worked and wrote a letter to the national party supporting it. The result was that the national party changed its position.

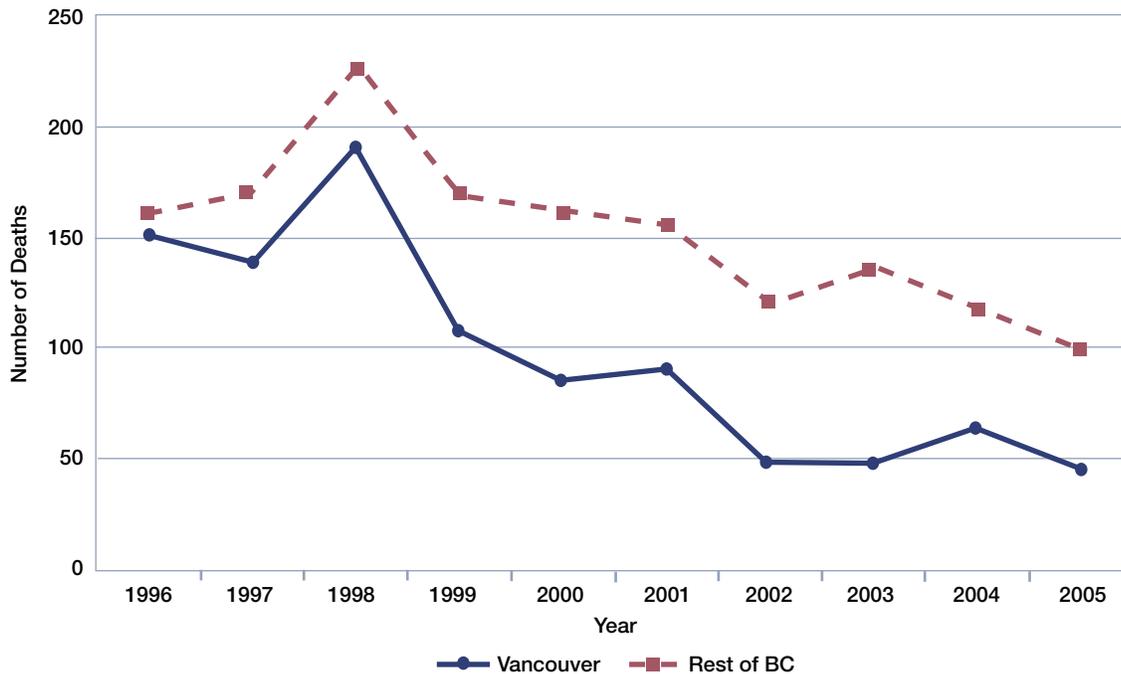
The program was expanded with temporary funding in 2007. The minister of health did not want to make a long-term commitment. However, he was convinced that the program worked after seeing one facility and observing that the patients were not in very bad condition. He forced the minister of justice to provide about half the additional funds, on the basis that the criminal justice system benefited, but the minister of justice opposed this. If the minister of health does not support continued funding after 2007, parliament will probably require it.

***Vancouver***

Canada, a country with a population of 31 million people, is estimated to have between 80,000 and 125,000 injecting drug users, representing a population rate not much different from that in the United States.<sup>20</sup> Approximately 60,000 to 90,000 individuals are estimated to use opioids<sup>21</sup> regularly (Popova, Rehm, and Fischer, 2006).

Vancouver, with a population of 580,000 and a metropolitan area population of 2.2 million, has been the city most affected by heroin use for more than 50 years. Perhaps, like Baltimore, this heroin problem reflects the city's status as a major port. For example, in 1954, a Canadian Senate committee set out to study why Vancouver had the worst heroin problem in the country. Benedikt Fischer and his colleagues (2005) analyzed differences among Canada's provinces in opioid problems. They estimated that the prevalence of regular illicit opioid use (mostly heroin) in 2003 was about 60 percent higher in British Columbia than in the next highest province. There are no documented estimates of the prevalence of heroin addiction at the city level.

By a variety of indicators Vancouver's heroin problem has been declining. For example, Figure 5 shows that the total number of deaths related to the use of illicit drugs has fallen substantially since the late 1990s. Whereas the average number of drug-related deaths was 160 from 1996 to 1998, that average fell to almost exactly one-third that level from 2003 to 2005.



**Figure 5: Deaths from Illicit Drugs in Vancouver and rest of BC, 1996-2005**

Source: *Buxton, 2006*

The Vancouver heroin problem once had a Chinese face but that was a long time ago. Chinese, Indian, and Vietnamese are involved in trafficking but use is not high in those communities. The Chinese merchant community, an important group in the city, is very hostile to drug users and favors draconian punishments; it has, however, ultimately supported the HAT experiment.

Vancouver's heroin problem has a very specific and visible face, associated with a 15 to 20 block area near the center of town. The city had about 6,000 SRO (Single Room Occupancy) hotel rooms concentrated in this area. The SROs had developed to serve the logging and fishing workers, who came into town for a few days of drinking, etc. These SRO facilities had never been very reputable and got worse as the clientele got poorer. Lay-offs in the lumber and fishing industries led to an increasing number of older, alcoholic, and drug-using men staying for longer periods in the SROs in the 1980s. The streets served as living rooms for those people.

There was a marked expansion of Vancouver's heroin problem in the late 1980s; the number of overdose deaths soared from 17 in 1987 to more than 200 in 1993. The problem also was conspicuous because it was so geographically concentrated in an area that abutted some upscale and commercial parts of the city. For a dozen years

---

the area around Main and Hastings was like Needle Park in Zurich. What follows are notes from observations of the area accompanied by a local activist.

“The area through which we walked is only about 15 to 20 blocks and the sidewalks are crowded with the walking wounded, ghastly emaciated figures that would make most people uncomfortable. There are various low-level commercial activities, such as a bottle collection facility but lots of the addicts were just sitting around in the middle of the day. It did not feel dangerous; only one or two males seemed aggressive. But it was chaotic and disturbing. In alley ways we saw people going through garbage containers and shooting up a couple of times. My guide says that about one-third of the addicts are aboriginal people.

“The area consists of medium-rise buildings—three to five stories, some of them formerly hotels; they constitute quite good housing stock. The drug district is surrounded by nicely restored areas, gentrification for an area that is near the water and very convenient for all sorts of the city’s amenities.

“A striking number of drug users are in wheelchairs. One explanation offered is that they have mostly been afflicted with osteomyelitis, the consequence of some distinctive features of the heroin scene in Vancouver. For example, the heroin has been pure enough that it is directly dissolved in water, without any heating; consequently, it is not as sterile as it is in other cities. The addicts did not always have access to clean tap water, so they would clean needles with water in the stagnant pools and pick up infections that way.”

Violent crime is modest in Vancouver; there are about 20 homicides a year in a city of 600,000. However auto breaking and entering and larceny are very high, and drug dependence is thought to be a contributing factor.

### **Political Background**

The chief drug policy officer for the city (Donald Ferguson) was the originator of a variety of innovations in the city. He became interested in HAT at a meeting of the International Harm Reduction Association; he was impressed by a presentation on the Swiss experience. His insight was that one important aspect of the heroin problem was a local responsibility, both in Europe and North America, namely managing the disorder surrounding drug scenes. He believes that many city governments in Europe have taken the lead on this; indeed, HAT in Switzerland was a Zurich initiative. In Germany, both Frankfurt and Hamburg have been very active on this. For example, both cities purchased buildings to house essentially homeless heroin addicts and to move them away from the drug scene, even if only a small distance. Frankfurt fought the national government in order to be allowed to set up safe injecting sites. Order is a local responsibility and can be separated from drug or health policy.

---

Vancouver has had three successive mayors who support drug policy innovations. Phillip Owen, a wealthy conservative, supported it but was then unseated by his own party. His successor was Larry Campbell, a former Royal Canadian Mountain Police (RCMP) official and coroner from the left-center who also made this a major issue; indeed, he made the election essentially a referendum on drug-reform issues. The current mayor, Sammy Sullivan, has also been very active. He is not very interested in safe injecting sites (regarding it as too passive) but would like to expand HAT substantially.

In April 2001, the city published the “Four Pillars” strategy document (MacPherson, 2001). It was mostly standard doctrine, promoting the need for balance among prevention, treatment, harm reduction, and law enforcement. The innovation was to present HAT as a treatment option; the Safe Injecting Site (SIS) was identified as a harm-reduction initiative. To promote this strategy, the mayor held six public hearings and had more than 30 meetings with specific groups. At each public hearing there was a representative for each pillar. By putting SIS and HAT in the context of a “balanced strategy,” the drug policy chief believes that much of the sting was removed.

Public support has been strong. The big battles were fought in fall 2001, over the development permits for four new facilities, two medical and two “low threshold,” though that refers to providing services without requiring abstinence or many other conditions. There were days of hearings on these facilities, with hundreds of supporters turning out in favor of the new facilities. The strong show of support established that the community wanted to do something about the problem of addicted drug users. Then the other innovations were more easily swallowed.

The police have been generally supportive of the experiment, which they see as potentially crime reducing. The police chief has been openly supportive, the rank and file passively so. There is still discomfort with the SIS because it has no crime-fighting potential.

**The Experiment<sup>22</sup>**

The HAT experiment in Vancouver is a component of a larger project, the North American Opiate Medication Initiative (NAOMI). Started in 1997, this was originally a joint Canadian-U.S. initiative, involving researchers from Montreal, Toronto, Vancouver, Baltimore, New Haven, and New York. The researchers agreed that a site was likely to be successful if it met three conditions: supportive political leadership, an entrepreneurial researcher, and a willing clinical site. Baltimore failed on the last, New York on the first. After about 2001, it was decided that the Canadian sites should go ahead on their own.

There have been criticisms of NAOMI. For example, Drs. Meldon Kahan, Anita Srivastava, and Kay Shen (2006) argued that the combination of high per patient costs

---

and difficulty in recruiting subjects appropriate for the specific design, along with the low expected methadone dose for the control group, undermined first the value and second the validity of the experiment. However, local opposition appears to have been modest.

Unlike the European trials, this was purely a private initiative. The local government was supportive but played no active role. An application to the Canadian Health Research Agency, CIHR, got a very high priority score (4.3 out of 5) but initially only half the required \$8.1 million. After a year in which the researchers explored alternative sources for the other half of the funding,<sup>23</sup> the CIHR received increased funding and decided to provide the other half as well. The trials were to be mounted in Montreal, Toronto, and Vancouver. Toronto dropped out because the local government demanded that it include those addicted to diverted pharmaceutical narcotics, which the researchers did not believe fit the goals of the experiment.

The initial budget request turned out to be too low. The researchers had failed to include money for the medication itself. That failure turned out to be very expensive because the regulatory agency refused to allow use of the formulation (simply the powder) that would be provided by the foreign manufacturer; this requirement raised the medication cost from \$100,000 to \$800,000. The costs of meeting various regulatory applications also turned out to be substantial. For example, the manufacturer's description of the process used for production had to be translated from German into English (fortunately not French as well). The program had to provide armored-car delivery each day and build very elaborate vaults for security purposes as well as seek approval from the International Narcotics Control Board (INCB) to import. This posed an interesting practical problem. The INCB allows no hold-over of stocks from one year to another. That requirement created problems, as NAOMI ordered heroin that it wasn't then able to take delivery of for some time.

The question of continued obligation to provide heroin to patients had to be dealt with as well. The Dutch had rules that there were contingent obligations, triggered for patients who had benefited from the heroin and then reverted when the drug was withdrawn. The Canadian experiment did not require continued provisions of heroin.

The Vancouver trial includes hydromorphone, another opioid used as an analgesic, as well as heroin; that is the novel double-blind component of the trial. Initially, it was thought that the patients would be able to tell the difference between the two medications. Indeed, there was, at first, intense interest among the participants in this matter; they often guessed wrong. After the first month they stopped paying attention to it. The hydromorphone arm has added to costs because the site had to be provided with the drugs in the syringe and the regulators said that there was no

---

evidence that this would be stable (against bacteria) for more than 72 hours. The researchers then did studies that showed it could be kept sterile for 31 days.

The original design called for 470 subjects (total of control and treatment) in the two sites (Montreal and Vancouver). Difficulties in recruiting made this problematic. The Vancouver program recruited 192 subjects over two years; Montreal recruited 59 subjects. Moreover, the differences in retention between the control and treatment groups were much higher than anticipated. The researchers went back to the project advisory group and received permission to cut the sample size. The recruitment difficulties arose partly from suspicion among users but also the screening criteria, in particular the requirement to have failed twice in methadone treatment. The definition of failure is that the patient received at least 60 milligrams per day for 30 days. It turns out that many patients dropped out of an episode in less than 30 days and/or received less than 60 milligrams. The patients typically know their dose because, in contrast to the U.S., the drug is dispensed in pharmacies, so the patient takes prescriptions to the pharmacist and sees the figure.

The requirement that participants come from within one mile of the facility turned out not to be important. The notion here was to prevent the area from acquiring even more users. However, the researchers doubted that there would have been many from outside the area who actually wanted to enter, so it has probably not been a serious constraint.

The trial received 1,500 inquiries about participation and 250 of those were screened as eligible. These figures suggest that if the program were to run as a routine part of the treatment system, it could indeed reach perhaps 15 percent of the total heroin-dependent population; that is a bit higher than the figure for Switzerland.

The program has a community advisory board of about 12 members who meet at least quarterly. After the first two or three meetings, concerns became so low that participation in meetings became minimal; officials turned up and typically the discussion was about addiction itself and treatment rather than the trial. A 24-hour hotline for complaints has yet to receive a single call. The community is now advocating for the program.

The program is open for three time periods a day, and most participants do in fact sign up for three daily injections; the average number of visits per day (preliminary data) is about 2.5. In contrast to the European programs, there is a tight schedule; each participant has to show up in a particular 20-minute slot in order to receive his injection. Failure to show up at that time means loss of that injection. Only 1 percent of appointments have not been met because of tardiness.

Heroin patients are allowed only eight minutes for the injection. There were initially a few problems with injectors trying to conceal some heroin; to improve surveillance

---

the staff cut the number of rooms that can be occupied from 12 to six. After the injections the patient must spend a half-hour waiting, in an effort to ensure that no one leaves in bad shape. If not fully recovered, the patient is then asked to stay another 15 minutes.

There is attention to sobriety. Patients can't get their heroin (or methadone) if their blood alcohol content is higher than 0.05; there is a checklist to assess sobriety before prescriptions are written. The problem is modest but persistent in a few patients. The week in which welfare checks arrive sees a distinct worsening of the problem.

The highest dosage received by a heroin patient is 1,000 milligrams per day. The regime is for a first injection of 15 milligrams over the course of three days, increasing to as much as 150 milligrams per injection. The amount is chosen by the staff based on how the patient tolerates the dose but it is not seen as a point of contention. Patients moved from an initial dose of 250 milligrams per day to between 400 and 500 milligrams per day within about four months.

The initial results of the study were published in October 2008. Primary outcomes included the retention rates at 12 months (87.8 percent for the experimental group vs. 54.1 percent for the control group receiving methadone) and the percent who "responded"<sup>24</sup> positively to treatment (67 percent vs. 47.6 percent, respectively). There were also greater reductions in expenditures on illegal drugs by the experimental group, as well as fewer days of criminal activity; both differences were statistically significant. There were a minimal number of adverse incidents in the facility, of which few were related to injecting as opposed to the pre-existing problems of the patients.

An important result was that hydromorphone (Dilaudid) did just as well as heroin, suggesting that it could be used instead; however, the number of patients receiving Dilaudid was very small indeed (25). The initial publication included no information on costs of the program; these estimates are scheduled to appear in early 2009.

### **The Future**

There is a real concern about what happens after the last of the experimental subjects is discharged. One researcher doubts that the program can be re-started if it gets closed down, but in any case, there is no obvious source of finance. The researchers may apply for another grant but that is not a permanent solution. The costs of operation are high; with about 80 subjects per annum, the researchers estimate operating costs (excluding research) at about \$1.5 million. The Montreal site probably has lower operating costs because it is able to take advantage of being at a hospital site. That is not an option in Vancouver where there is a strong belief that the effectiveness of the program is partly dependent on it being *in situ* in



---

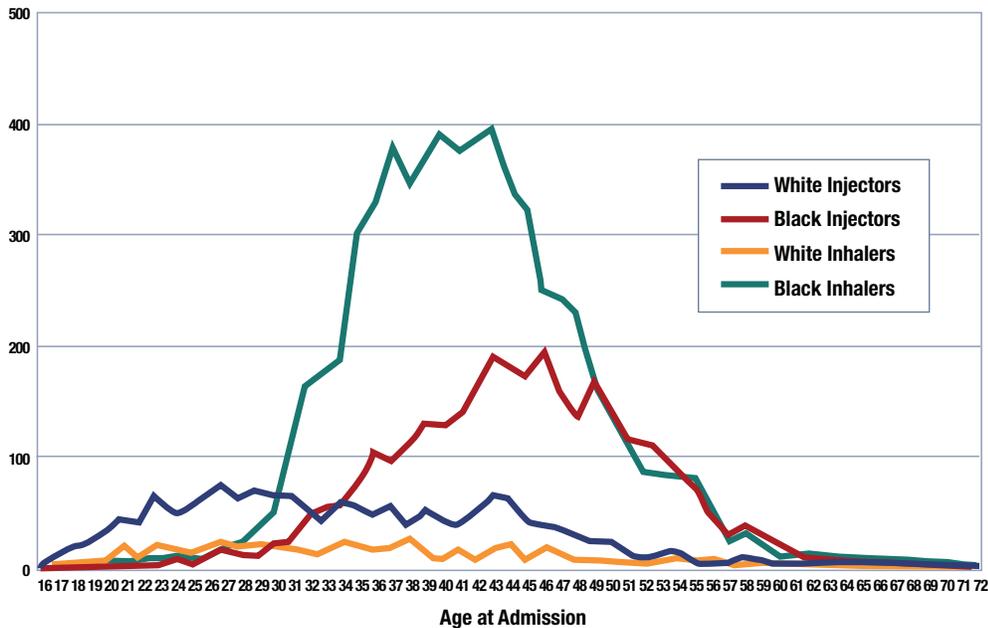
# The Heroin Problem in Baltimore City

As already noted, Baltimore is a city unusually harmed by heroin, and this has been true at least since the late 1960s. A small number of indicators describe that damage. For example, the heroin related number of heroin related admissions to emergency departments in hospitals in Baltimore in 2002<sup>25</sup> was estimated at 6,000, equivalent to 10 per thousand persons. Among 21 metropolitan areas, Baltimore has the third-highest rate of heroin related admissions to emergency departments (203 per 100,000 persons), only exceeded by Chicago (220) and Newark (214); unfortunately, it is not possible to make comparisons at the city level. The Baltimore metropolitan rate is much higher than for Philadelphia (109) or Washington, D.C. (38). In 2003, in metropolitan Baltimore (including Anne Arundel County), there were 469 deaths in which the medical examiner detected heroin as causally involved; more than half of these occurred in Baltimore City (Substance Abuse and Mental Health Service Administration, no date).<sup>26</sup>

Over the last decade, there has been a very substantial expansion of the drug- treatment system, which is dominated by heroin admissions. Substance-abuse treatment funding rose from \$17.7 million in fiscal year 1996 to \$52.9 million in fiscal year 2005 (Baltimore City Health Department, 2007, p.4). In Baltimore City the number of admissions for treatment of heroin problems rose from 10,854 in 1999 to 17,050 in 2005<sup>27</sup>; it is worth noting that this latter figure is comparable to the figure for heroin-related admissions for all of the Netherlands (a nation of 15 million) or of Switzerland (7 million population). This indicates both the gravity of Baltimore's problem and the extent of its response. Data on the population in treatment for heroin abuse in Baltimore City are presented in the appendix.

The treatment population has notably aged even in the period from 1999 to 2005. In 1999, only 4.1 percent were over the age of 40; by 2005, that rose to 10.2 percent. Correspondingly, the percentage under the age of 21 fell from 7.8 percent to 5.4 percent. As might be expected, the percentage of addicts admitted to treatment for the first time also declined between 1999 and 2005, from 35.3 percent to 24.7 percent. Having said that, data still indicate that there are new and young heroin users being recruited.

African Americans account for four-fifths of all treatment admissions, females for about 45 percent. A striking feature of the treatment data is the great difference between black and white patients in terms of the mode of consumption. White users are much more likely to inject (three-quarters in 2005), blacks are much more likely to inhale or smoke (two-thirds in 2005). Figure 6 shows the differences between groups by age. Note that among the younger admissions to treatment white injectors dominate, whereas for ages 30 to 50 the dominant group is black inhalers.



**Figure 6: Heroin-related Admissions of Baltimore City Residents to Certified Maryland Alcohol & Drug Abuse Treatment Programs by Primary Route of Administration, SFY 2007**

Source: *Maryland Department of Alcohol and Drug Abuse*

It is difficult to obtain criminal justice data specific to heroin because the FBI’s Uniform Crime Reports do not separate heroin and cocaine. The joint category accounts for a very high percentage of all drug arrests in Baltimore City; this becomes particularly conspicuous when viewed in contrast to Baltimore County. For example, in 2003, in Baltimore City (population 628,000) there were 28,000 adult arrests for drug offenses (both possession and sales). Of these, almost one-third (9,000) were for sales of cocaine or heroin; more than one-half (15,000) were for possession of cocaine or heroin. In contrast in Baltimore County in the same year (population 787,000) there were only 3,300 adult arrests for drug violations; of these only one-eighth (415) were for sales of cocaine or heroin and one-quarter (860) were for possession of these drugs. The population rate of heroin/cocaine possession arrests for the city was almost 25 times that of the county.

Heroin trafficking is also a major source of problems for the city. There is a continued flow of killings related to heroin trafficking. Indeed, it is often asserted that the heroin trade is a major factor in explaining why Baltimore has not seen the reduction in homicides that so many other large cities have witnessed, though this is no more than plausible conjecture (e.g., Bykowicz, 2007).

---

# Policy Analysis

Heroin maintenance has not been widely discussed in the United States in the last decade. It remains, however, prominent and controversial in other countries, as evidenced by a recent review and exchange of comments in the *British Medical Journal* (Sheldon, 2008; McKegany, 2008; and Rehm and Fischer, 2008). Enough evidence has emerged in the last 10 years to merit reconsideration of its potential for Baltimore, and the U.S. more generally.

This report has not reviewed the evidence from all sites. In particular, there has been minimal discussion of the results and experiences in Britain, Germany, and Spain. They are not generally thought to add much scientifically but the publications from Germany and Spain are consistent with the positive results from other sites; the British study has not been completed. The unwillingness of the current German government, involving a grand coalition (Christian Democratic and Social Democratic parties governing together), to implement the results of an experiment conducted under the auspices of its Social Democratic predecessor, perhaps adds a further observation of the fragility of political support for this kind of innovation in drug policy.



---

facilities, dispensing the drug into the black market. Though it is difficult to develop a research design that would assess changes in initiation, no one has claimed that the availability of HAT has led to an increase in the number of persons experimenting with heroin. The heroin populations in the Netherlands and Switzerland continue to age.

The operation of HAT has not led to a loss of public support for the program in any site where it has been tried. A November 2008 referendum on continuing heroin maintenance in Switzerland resulted in a favorable vote of more than two-thirds. While there are initial local complaints about the client population, these seem to fade fairly rapidly. There is also nothing to suggest that the complaints are more serious than those surrounding a methadone clinic.

One concern is that heroin assisted treatment is substantially more expensive than MMT. In Switzerland the only detailed study in 1998 found that total costs per patient per day were about 50 Swiss Francs (equivalent to US\$37). The estimate for 2005 was that daily costs were about 50 to 70 Swiss Francs (US\$38-53) per day (Office of Public Health, 2006). Dijkgraaf, et al., 2005 reported detailed data from the Dutch experiments. The heroin-patients costs were much higher not because of the cost of the heroin itself (approximately 550 Euros [US\$652] per patient) but primarily because of all the associated program costs (17,000 Euros vs. 1400 Euros [US\$20,163 vs. US\$1,660] per patient). See also Lemmens (2003) reporting that heroin program costs are far higher than those for methadone maintenance. However, studies in both the Netherlands (Dijkgraaf, et al., 2005) and Switzerland (Frei, 2001) found that the additional benefits outweighed the additional costs. For example, adding the social costs to the costs of provision of services, a patient in treatment for a given period of time in the heroin arm of the Dutch trials costs 37,000 Euros (US\$43,885) compared to 50,000 Euros (US\$59,304) for the methadone arm of the trial.

Reductions in crime were a large part of the gains, as was true in the Swiss studies. This points to a chronic problem of substance-abuse treatment funding; the expenditures are borne by the health-care sector, while the benefits are primarily reaped by the criminal justice sector (reduced costs for arresting and punishing offenders) and the community (lower victimization). Efforts to integrate treatment with criminal justice, for example through drug courts, are recognition of that problem.

Heroin maintenance is a troubling public policy intervention. As Neil McKegany (2008) argues, it appears to condemn the patient to a lifetime of addiction, serviced by the government. However, in Switzerland and Germany the data suggest that HAT might be, for many clients, a transitional rather than terminal state. If that is the case, then the argument for HAT is substantially strengthened.

---

Heroin assisted therapy is clearly a supplement to methadone maintenance rather than a substitute for it. Even where it is readily available, the bulk of heroin addicts in treatment seek methadone instead. In no site where HAT has been available has it attracted a substantial share of the heroin users who seek treatment; 10 percent is a high estimate of the potential share of treatment slots that might be occupied by HAT clients. Given the political and programmatic challenges that confront HAT in Baltimore, is it worth undertaking the effort for such a small share of clients?

Central to answering this question is an assessment of which clients are likely to enter HAT in Baltimore City. The city has, like all the other jurisdictions that have implemented this program, an aging population of heroin-using clients, many of whom have failed a number of prior episodes of treatment; one-third of those admitted in 2005 had three or more prior treatment admissions. They may benefit from methadone maintenance but the probability of drop-out is very high.

At best there is a case for an experiment in Baltimore. There are too many potential differences between Baltimore and the other sites in which HAT has been tried to allow confident predictions of the outcomes for Baltimore. As described by Rehm and Fischer (2008), it has so far been provided “in countries where there is already an established and effective comprehensive system for treating opioid dependency” (p.71). Even with the expansion of Baltimore’s treatment system in the last decade, and the introduction of buprenorphine, one could hardly describe it as effective and comprehensive when compared to those other nations. In Baltimore, as in other U.S. cities, the funding is more fragile, the connections with the health-care system more tenuous, and the other social services more meager than in Switzerland, the Netherlands, or even Canada.

These are important considerations because HAT places great demands on operators, many more demands than even on the provision of methadone, which is heavily regulated. Security for the protection of the heroin itself is a major issue and there will be higher scrutiny than for substitution programs. As the Vancouver site discovered in the course of its experiment, it is hard to anticipate all the hurdles that agencies at various levels of government will place on the programs. There will be knotty reimbursement issues for provision of a Schedule I drug, assuming that the federal government even allows heroin to be imported into the country for such an experiment.

Moreover, visits to facilities in other countries hardly provide an inspiring model. The client population is highly troubled so even if HAT leads to better outcomes for the group as a whole, many of them will remain unemployed, marginalized, and in poor health conditions. There will be some poster children, but not many.

---

Any experiment in Baltimore will require substantial cooperation by the federal government. Heroin is a Schedule 1 drug, available only for research purposes when specific application is made. While this might indeed qualify as an experiment, there is no evidence of interest by federal agencies, including the principal research funder, the National Institute on Drug Abuse (NIDA), in facilitating the research. As noted above, NIDA declined the opportunity to support the Vancouver experiment, which was conducted by a highly regarded research team. Persuading the relevant agencies to grant a research license for the importation of heroin for this experiment would be difficult. It is likely that the DEA would be highly skeptical of an experiment and that

The potential gains, however, are substantial. Even in the aging heroin-addict population there are many who are heavily involved in crime and return frequently to the criminal justice system. Their continued involvement in street markets imposes a large burden on the community in the form of civil disorder that helps keep investment and jobs out. If heroin maintenance could remove 10 percent of Baltimore's most troubled heroin addicts from the streets, the result could be substantial reductions in crime and various other problems that greatly trouble the city. That is enough to make a debate on the matter worthwhile.

Benedikt Fischer and colleagues (2007), after reviewing the scientific evidence, concluded by saying, "The pressure was primarily on science to produce the evidence basis on HAT—the pressure is now on politics to use the evidence generated in the interest of reduced harms and costs related to the problem of heroin addiction" (page 560).

---

# References

- Baltimore City Health Department, "The Baltimore Buprenorphine Initiative: Interim Progress Report," 2007, [www.baltimorehealth.org/info/2007\\_07\\_18.bupreport.pdf](http://www.baltimorehealth.org/info/2007_07_18.bupreport.pdf).
- Buxton, J., "Vancouver Drug Use Epidemiology," 2007, [http://vancouver.ca/fourpillars/documents/Full\\_CCENDU\\_report\\_2007\\_web.pdf](http://vancouver.ca/fourpillars/documents/Full_CCENDU_report_2007_web.pdf).
- Bykowicz, J., "The Numbers Look Bleak for City Mired in Murder, and No Approach has Brought Lasting Success," *The Baltimore Sun*, 30 December 2007.
- Dijkgraaf, M., et al., "Cost Utility Analysis of Co-prescribed Heroin Compared With Methadone Maintenance in Heroin Addicts in Two Randomized Trials," *British Medical Journal*, 2005; 330: 1297-1302.
- Farrell, M. and W. Hall, "The Swiss Heroin Trials: Testing Alternative Approaches," *British Medical Journal*, 28 February 1998; 316: 639.
- Fischer B., et al., "Illicit Opioid Use in Canada: Comparing Social, Health and Drug Use Characteristics of Untreated Users in Five Cities" (OPICAN study), *J Urban Health Bull NY Acad Med*, 2005; 82: 250-66.
- Fischer, B., et al., "Heroin-assisted Treatment (HAT) a Decade Later: A Brief Update on Science and Politics," *Journal of Urban Health*, 2007; 84(4).
- Frei, A., "Economic Evaluation of the Swiss Project on Medically Prescribed Heroin Substitution Treatment," *Psychiatrische Praxis*, 2001; 28: S41-44.
- Grund, J.P and P. Blanken, *From Chasing the Dragon to Chinezen*, The Hague, Netherlands, CIP-Gegevens Koninklijke Bibliotheek, 1993.
- Gutzwiller, F., and A. Uchtenhagen, "Heroin Substitution: Part of the Fight Against Drug Dependency," In Lewis, et al., 1997.
- Kahan, M., et al., "Why We Object to Naomi," *Canadian Family Physician*, 2006; 52: 705-6.
- Krausz, M., et al., "Heroin Assisted Treatment: Current State of Research," unpublished paper, University of British Columbia, 2007.
- Lemmens, P., "Dutch Government Backs Down on Heroin Prescription, Despite Successful Trial," *Addiction*, 2003; 98: 247-9.
- Lewis, D., et al., *The Medical Prescription of Narcotics: Scientific Foundations and Practical Experiences*, (Seattle: Hogrefe and Huber, 1997).

---

Maag, V, "Estimated Trends in the Prevalence of Heroin Addiction in Switzerland," European Addiction Research, 2003; 176-81.

MacCoun, R. and P. Reuter, Drug War Heresies: Learning from Other Vices, Times and Places, (Cambridge: Cambridge University Press, 2001).

MacPherson, D., A Framework for Action: A Four Pillar Approach to Drug Problems in Vancouver, (Vancouver: Mimeo, 2001).

March J.C., et al., "Controlled Trial of Prescribed Heroin in the Treatment of Opioid Addiction," J Subst Abuse Treat, 2006; 31(2): 203-11.

McKegany, N., "Should Heroin be Prescribed to Heroin Misusers? No," British Medical Journal, 2008; 336: 71-2.

Ministry of Health, Welfare and Sports, "Progress Report on Dutch Drug Policy," The Hague, 2002.

NAOMI Study Team, "Reaching the Hardest to Reach –Treating the Hardest-to-Treat: Summary of the Primary Outcomes of the North American Opiate Medication Initiative (NAOMI), 2008, <http://www.naomistudy.ca/pdfs/NAOMI.Summary.pdf> [accessed November 3, 2008].

National Alcohol and Drugs Information System, "Key Figures Addiction Care: 2006," 2007, [http://www.sivz.nl/content/\\_files/Key\\_Figures\\_2006.pdf](http://www.sivz.nl/content/_files/Key_Figures_2006.pdf).

National Drug Monitor, "Drug Situation in the Netherlands: National Report," European Monitoring Center on Drugs and Drug Abuse, Lisbon, 2003.

Nordt, C. and R. Stohler, "Incidence of Heroin Use in Zurich, Switzerland: A Treatment Case Register Analysis," *The Lancet*, 2006; 367: 1830-34.

Office of National Drug Control Policy, "What America's Users Spend on Illicit Drugs," Washington, D.C., 2001.

Office of Public Health of Switzerland (2006), [www.bag.admin.ch/.../8ull6Du36WenojQ1NTTjaXZnqWfVp3Uhmfhnapmmc7Zi6rZnqCkkIZ2fn97bKbXrZ6lhuDZz8mMps2gpKfo](http://www.bag.admin.ch/.../8ull6Du36WenojQ1NTTjaXZnqWfVp3Uhmfhnapmmc7Zi6rZnqCkkIZ2fn97bKbXrZ6lhuDZz8mMps2gpKfo) [last accessed August 22, 2008].

Perneger, T. V., et al., "Randomized Trial of Heroin Maintenance Programme for Addicts Who Fail in Conventional Drug Treatments," *British Medical J.*, 1998; 371: 13-18.

---

Popova, S., et al., "An Overview of Illegal Opioid Use and Health Services Utilization in Canada," *Public Health*, 2006; 120: 320-28.

Rehm J., et al., "Feasibility, Safety, and Efficacy of Injectable Heroin Prescription for Refractory Opioid Addicts: A Follow-up Study," *Lancet*, 2001; 358:1417-20.

Rehm, J. and B. Fischer, "Should Heroin be Prescribed to Heroin Misusers? Yes," *British Medical Journal*, 2008; 336: 70-1.

Reuter, P and A. Stevens, "An Analysis of U.K. Drug Policy," U.K. Drug Policy Commission, 2007.

Schwartz, R.P, et al., "A Randomized Controlled Trial of Interim Methadone Maintenance," *Archives of General Psychiatry*, 2006; 63: 102-09.

Sheldon, T., "More Than a Quick Fix," *British Medical Journal*, 2008; 336: 68-9.

Stimson, G. and N. Metrebian, *Prescribing Heroin: What is the Evidence?* (York: Joseph Rowntree Foundation, 2003).

Substance Abuse and Mental Health Services Administration, "DAWN 2003: Area Profiles of Drug-related Mortality," Rockville, MD, (no date).

Uchtenhagen, A. (ed.), *Prescription of Narcotics for Heroin Addicts: Main Results of the Swiss National Cohort Study* (Medical Prescription of Narcotics, Vol. 1) Karger, 1999.

Van Ameijden, E.J.C., et al., "Dose-effect Relationship Between Overdose Mortality and Prescribed Methadone Dosage in Low-threshold Maintenance Programs," *Addictive Behaviors*, 1999; 24(4): 559-63.

Van den Brink W, et al., "Medical Prescription of Heroin to Treatment Resistant Heroin Addicts: Two Randomized Controlled Trials," *BMJ*, 2003; 327(7410): 310-15.

Verthein, U., et al., "Long Term Effects of Heroin Assisted Treatment in Germany," *Addiction* 2008; 103(6): 960-66.

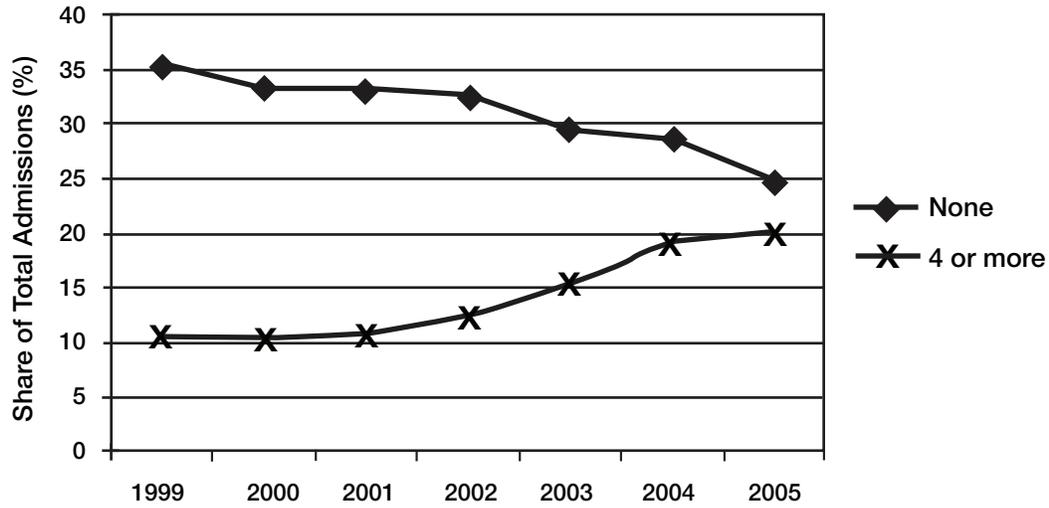
Wood, E., et al., "The Canadian Government's Treatment of Scientific Process and Evidence: Inside the Evaluation of North America's First Supervised Injecting Facility," *International J. Drug Policy*, 2008.

# Appendix

## Baltimore City treatment admissions data

	1999	2000	2001	2002	2003	2004	2005
Total Heroin-Related Admissions	12854	12478	14241	15814	17442	17062	17052
Unduplicated Heroin-Related Admissions	9540	9236	10391	10935	11393	10528	10546

## Baltimore Heroin Admissions by Number of Prior Admissions, 1999-2005



---

# About Peter Reuter

Peter Reuter is Professor in the School of Public Policy and in the Department of Criminology at the University of Maryland. From 1999 to 2004 he was editor of the *Journal of Policy Analysis and Management*. He is Director of the Center on the Economics of Crime and Justice Policy at the University and also Senior Economist at RAND.

From 1981 to 1993 he was a Senior Economist in the Washington office of the RAND Corporation. He founded and directed RAND's Drug Policy Research Center from 1989-1993; the Center is a multi-disciplinary research program begun in 1989 with funding from a number of foundations. His early research focused on the organization of illegal markets and resulted in the publication of *Disorganized Crime: The Economics of the Visible Hand* (MIT Press, 1983), which won the Leslie Wilkins award as most outstanding book of the year in criminology and criminal justice. Since 1985 most of his research has dealt with alternative approaches to controlling drug problems, both in the United States and Western Europe. His other books are (with Robert MacCoun) *Drug War Heresies: Learning from Other Places, Times and Vices* (Cambridge University Press, 2001) and (with Edwin Truman) *Chasing Dirty Money: The Fight Against Money Laundering* (Institute for International Economics, 2004). In 2009 Oxford University Press will publish two books that he has co-authored: *The World Heroin Market: Can Supply be Cut* and *Cannabi: Moving beyond the Stalemate*. Dr. Reuter was a member of the National Research Council Committee on Law and Justice from 1997-2002 and of the Office of National Drug Control Policy's Committee on Data, Research and Evaluation from 1996-2003. He served on the Institute of Medicine Committee on the Federal Regulation of Methadone (1992-1994) and the IOM panel on Assessing the Scientific Base for Reducing Tobacco-Related Harm (2000) and on the NRC Committee on Improve Research and Information on Firearms. The Attorney General appointed him as one of five non-governmental members of the Interagency Task Force on Methamphetamine in 1997. He has testified frequently before Congress and has addressed senior policy audiences in many countries, including Australia, Chile, Colombia and Great Britain. He has served as a consultant to numerous government agencies (including GAO, ONDCP, NIJ, SAMHSA) and to foreign organizations including the European Monitoring Center on Drugs and Drug Abuse, United Nations Drug Control Program and the British Department of Health. Dr. Reuter received his PhD in Economics from Yale.

---

# Endnotes

- 1 See Legislative File Number 07-0327R (version 0) “Informational Hearing - Is Legalization of Drugs the Answer for Baltimore City?”
- 2 For a detailed description of what heroin maintenance involves, see Stimson and Metrebian (2003).
- 3 The Office of National Drug Control Policy, ONDCP, (2001) estimated that the United States had about 1 million chronic heroin users in 2000, approximately 3.5 per thousand population.
- 4 See Legislative File Number 07-0327R (version 0) “Informational Hearing - Is Legalization of Drugs the Answer for Baltimore City?”
- 5 For a detailed description of what heroin maintenance involves, see Stimson and Metrebian (2003).
- 6 This section draws heavily on MacCoun and Reuter, (2001, Chapter 12).
- 7 249 U.S.A. 96 (1919)
- 8 This is not specific to heroin; the doctor may maintain an addicted patient on the drug to which the patient is addicted.
- 9 All quotes from “Heroin maintenance quickly stirs outrage,” *The Baltimore Sun* 12 June 1998.
- 10 Estimates for the United States were published from time to time between 1993 and 2001 in a series entitled What America’s Users Spend on Illicit Drugs, sponsored by the Office of National Drug Control Policy. The most recent of these estimates provided figures covering the period from 1988 to 2000. A more recent study, updating the figures to 2004, was referenced in the 2005 National Drug Control Strategy but was never published.
- 11 Reuter and Stevens (2007) provide analysis data showing that this statement does not hold for the United Kingdom; initiation into heroin use continued to rise over approximately a 25-year period, 1975-2000.
- 12 The metropolitan area population is 1 million; the whole canton has 1.2 million, out of Switzerland’s total population of 7.5 million.
- 13 The estimated cessation rate is about 4 percent per annum (Nordt and Stohler, 2006). Assume an addict population of 30,000 and a 1980s birth cohort size of 60,000. The 1980s birth cohorts are those at risk in the near future of dependence. If recruitment is equivalent to 2 percent of the current addict population per annum, that is roughly 10 per 1,000 in each birth cohort. The net effect would be a decline of about 2 percent per annum, which would lead to a decline of only about one-quarter in the heroin population over the course of a decade.
- 14 For a discussion of low-threshold programs see Ameijden, Lanbngendam, and Coutinho, 1999. In the U.S. such programs are referred to as interim methadone maintenance programs. For an evaluation of such a program in Baltimore see Schwartz, et al., 2006.
- 15 There are 26 cantons in Switzerland, equivalent to U.S. states in their autonomy and powers but more like counties in size.

<sup>16</sup> For example, The Office of National Drug Control Policy, ONDCP, (2001) assumes for purposes of calculating total heroin consumed in the United States that average daily dose is about 50 milligrams of pure heroin.

<sup>17</sup> This subsection is based on visits to programs in Basel, Bern, Thun, and Zurich in January 2007, as well as on documents collected at that time and later.

<sup>18</sup> A recent paper (*Verthein, et al., 2008*) reports very similar results for two-year follow-up for a German trial of HAT. At that point, 36 percent of all drop-outs had entered some other form of treatment; three-quarters of those entered methadone treatment.

<sup>19</sup> The Office of National Drug Control Policy, ONDCP, (2001) estimated that the United States had about 1 million chronic heroin users in 2000, approximately 3.5 per thousand population.

<sup>20</sup> There are no systematic estimates of the number of injecting drug users in the United States. The statement here is a rough judgment based on the number and share of heroin and cocaine users who inject.

<sup>21</sup> Opioids refers to a broader class of narcotic drugs that includes synthetic substances such as fentanyl, as well as substances such as morphine and heroin that are based on opium.

<sup>22</sup> This section is based largely on the initial results that appeared in October 2008; NAOMI Study Team.

<sup>23</sup> The U.S. National Institute on Drug Abuse expressed a lack of enthusiasm for a formal application.

<sup>24</sup> We defined a “responder” as a subject who met both of the following criteria at the 12-month outcome assessment: (1) demonstrated at least 20 percent improvement in the illicit drug-use subscale or in the legal status (criminal justice involvement) subscale of the EuropASI, or in both relative to their baseline scores, and (2) demonstrated a deterioration of 10 percent or more on at most one of the remaining seven EuropASI subscales relative to baseline.

<sup>25</sup> The DAWN system (Drug Abuse Warning Network) changed in 2002 to a new system that so far produces only national level estimates. Furthermore, the DAWN website says that existing publications for the new system are likely to be revised because of technical errors.

<sup>26</sup> The medical examiner’s office (personal communication) provided data for Baltimore City and Baltimore County.

	Baltimore City	Baltimore County
2003	246	84
2004	195	49
2005	177	38
2006	198	40

<sup>27</sup> The 2006 figure shows a drop of 25 percent, which was followed by a further 6 percent decline in 2007. In 2006, changes were made in the coding system and the city stopped funding outpatient detox programs and an Intermediate Care Facility at Johns Hopkins. Thus, data from 2006 and later are not comparable to 2005 and earlier.