

# Illicit Opioid Use and Its Key Characteristics: A Select Overview and Evidence From a Canadian Multisite Cohort of Illicit Opioid Users (OPICAN)

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**Objectives:** To summarize key characteristics and consequences of illicit opioid use from the literature and to present corresponding data from a multisite sample of illicit opioid users in 5 Canadian cities (OPICAN study).

**Method:** We undertook an overview of recent literature from North America, Australia, and Europe. We obtained data from the multicity OPICAN cohort study, which consisted of an interviewer-administered questionnaire, a standardized mental health instrument (the Composite International Diagnostic Interview Short Form for depression), and saliva-antibody tests for infectious disease (that is, HIV and hepatitis C virus). The baseline sample ( $n = 679$ ) was collected in 2002.

**Results:** Illicit opioid use in Canada and elsewhere is becoming increasingly heterogeneous in terms of opioid drugs used, with heroin playing an increasingly minor role; further, it predominantly occurs in a context of polydrug use (for example, cocaine–crack or benzodiazepines). Large proportions of illicit opioid users have physical and (or) mental health comorbidities, including infectious disease and (or) depression, and therefore require integrated interventions. Finally, morbidity risks among illicit opioid users are often predicted by social marginalization factors, for example, housing status or involvement in crime.

**Conclusions:** Given the epidemiologic profile and high disease burden associated with contemporary forms of illicit opioid use, more effective treatment approaches are urgently needed in Canada and elsewhere. Specifically, treatment must adjust to the extensive polysubstance use realities, yet it must also more effectively address the complex physical and (or) mental health comorbidities presented by this high-risk population.

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## Clinical Implications

- Illicit opioid use to a large extent manifests via the illicit use of prescription opioids and typically includes polysubstance use.
- Physical and (or) mental health comorbidities are highly prevalent in illicit opioid user populations.
- Morbidity and (or) mortality risks are often associated with social marginalization.

## Limitations

- Little is known about the patterns and consequences of illicit opioid use in general populations.
- Owing to the marginalized and illegal status of illicit opioid users, information is available only from selective populations with limited potential for generalizability of data.
- The OPICAN study specifically builds largely on self-report and may be subject to bias.

**Key Words:** *illicit opioid use, comorbidity, infectious disease, treatment, polysubstance use, dependence, opioid maintenance, social determinants, public health, Canada*

Illicit opioid use has been a main element of illicit drug use in North America and other occidental countries for more than a century. However, while the phenomenon has typically been associated with the narrow image of the “heroin junkie” (1), the current reality of illicit opioid use has become much more diverse and complex. Illicit opioid use is associated with considerable risks and harms relating specifically to users’ drug use, health, and social problems (for example, crime). Many of these characteristics contribute to the substantive disease, as well as to the social cost, burden of illicit opioid use, making it an important public health problem and underscoring the need for effective interventions (2,3). This paper’s objectives are twofold: we selectively present key characteristics and consequences of illicit opioid use, drawing on data from Canada, Australia, Europe, and the United States; and we present corresponding data from a multisite sample of illicit opioid users in 5 Canadian cities (the OPICAN study). Finally, we discuss implications for policy and practice.

## Overview

### Epidemiology

The extent of illicit opioid use is typically expressed by estimates of illicit opioid user populations on a country basis. For example, in Canada, it is estimated that there are between 90 000 and 125 000 IDUs, most of whom are believed to use illicit opioids (4,5). The Office of National Drug Control Policy estimates that there are between 750 000 and 1 million heroin users in the United States (6). In Australia, the number of dependent heroin users (aged 15 to 54 years) has been estimated to be about 75 000, a figure that has reportedly doubled since the mid-1980s (7). Current estimates from the European Union suggest there are between 1.2 and 2.1 million illicit drug users and between 850 000 and 1.3 million IDUs, indicators that principally reflect opioid use (8).

In recent years, research has suggested that illicit opioid use in known problem populations is by far not limited to heroin but, rather, increasingly includes a large and diverse amount of legally available—and illegally diverted—prescription

opioids, including hydromorphone (Dilaudid), oxycodone (Oxycontin), codeine (Codeine), meperidine (Demerol), morphine (MS-Contin), and hydrocodone (Vicodin). In some populations, heroin is even completely absent from illicit opioid user profiles. For example, in a recent study of regular opioid users in Toronto, Ontario, who were neither in treatment nor actively seeking treatment, 73% indicated the use of nonheroin opioids in the past 30 days (9). A study of illicit opioid-dependent individuals attending a large Toronto MMT program reported that oxycodone (46.6%), codeine (45.5%), morphine (21.3%), and hydromorphone (17.4%) were the most prevalently used prescription opioid drugs. A sizeable proportion of the sampled individuals were exclusively dependent on prescription opioids and had never used heroin in their lives; many attributed their ongoing opioid use to a habit that was initiated through treatment received for pain (10).

While the expanding role of prescription opioids in these known problem populations is increasingly recognized, the focus on them may only reveal a limited view of the overall picture. In North America, staggering prevalence rates of prescription opioid misuse have been recently reported for general populations, which in terms of their epidemiologic significance far outweigh rates for street user populations. For example, 4.7% of the US household population over the age of 12 years (that is, 11.0 million people) abused an opioid medication in 2002. The annual incidence of opioid analgesic abuse in the United States increased to about 2.4 million initiates in 2001, a fourfold increase from 1990 (11–13). This recent annual opioid abuse incidence is more than double the size of the United States’ total estimated heroin user population. The massive increases in prescription opioid abuse have cooccurred with substantive increases in prescription opioid mentions in emergency department admissions and in deaths investigated by coroners in the United States (11). Comparable systematic prescription opioid abuse data for Canada are missing (14). For example, no items on prescription drug abuse were included in the recent Canadian Addiction Survey (15), although recent anecdotal evidence points to similar spikes in prescription opioid misuse. Major upsurges in Oxycontin abuse have been reported in Eastern Canada, including in St John’s, Newfoundland, where the number of users is growing, particularly among adolescents (16). In both general and marginalized populations, the massive increases in prescription opioid use must certainly be understood in the context of substantially increased availability and supply in recent years. Generous opioid prescription practices in the medical system, and also their ready availability via the

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### Abbreviations used in this article

CIDI-SF	Composite International Diagnostic Interview Short Form
HCV	hepatitis C virus
IDU	injection-drug user
MMT	methadone maintenance treatment

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Internet, have facilitated a drug-rich environment in North America that allows easy misuse and diversion to illicit markets (11,14). According to International Narcotics Control Board data (17), the United States is by far the world's largest consumer of prescription opioids on a per capita basis (25 993 defined daily doses of opioid per million population in the period 2001 to 2003). Canada ranks as the fifth highest consumer overall (10 209 defined daily doses) and even heads the list for specific opioids (for example, hydromorphone) (17). Combined, the United States and Canada consume more than one-half (56.2%) of the world's morphine, most of which is used for the manufacturing of other opioid prescription drug products (17). Clearly, an analysis of the characteristics and consequences of illicit opioid use that does not consider the extensive nonmarginalized user populations has limited utility, and a comprehensive analysis must be undertaken in the future. Currently, few data or, in the case of Canada, no data exist beyond prevalence or incidence descriptions; hence, in this paper, we limit the discussion to an overview focusing on marginalized and high-risk illicit opioid user populations.

### *Nonopioid Use*

Marginalized opioid user populations typically do not restrict their drug use to opioids, yet they are increasingly characterized by so-called "polydrug use" profiles. Such polydrug use typically involves cocaine, benzodiazepines, and alcohol as key components. In the Toronto study conducted with regular opiate users not in treatment, 70% had used alcohol, 64% had used cannabis, 61% had used benzodiazepines, and 58% had used cocaine (9). Among heroin users in Australia ( $n = 222$ ), 65% received a lifetime diagnosis of alcohol dependence, 23% of benzodiazepine dependence, and 9% of cocaine dependence (18).

One specific form of polydrug use is the combination of opioids and cocaine, typically referred to as "speedballing," where the 2 substances are mixed and administered by injection. This has been the preferred drug use activity in certain urban IDU populations, for example, among IDUs in Vancouver (19). Although the combined pharmacologic properties and effects of heroin and cocaine are experienced as desirable by the user (20), the short effect curve of cocaine typically leads to high injection frequency, or even injection binges, and consequently, a dramatically increased risk for disease transmission (due to needle-sharing) or overdose (21–23). Further, polydrug use patterns involving the use of opioids combined with stimulants (such as cocaine, benzodiazepines, or alcohol) have problematic health consequences, since they substantially elevate the risk for (fatal or nonfatal) overdose.

In most fatal overdose cases involving illicit opioid use, at least one of these nonopioid stimulants was also present (24–27).

However, not only drug use profiles but also the modes of drug administration have become more heterogeneous among illicit opioid users. Data from several jurisdictions, including several European countries—for example, The Netherlands and Spain—as well as from Australia and the United States, suggest that noninjection practices are increasingly prevalent or may even be the dominant route of drug administration (28–32). Although opioids may be "snorted" (that is, administered intranasally) in some cases, they may also be swallowed or smoked, or their fumes may be inhaled ("chasing the dragon") (33). Overall, noninjectors are exposed to fewer health risks and harms, compared with injectors. For example, being a noninjector has been shown to indicate lower levels and shorter duration of drug dependency (34), lower prevalence of and fewer risks for transmission of blood-borne infectious disease (that is, HIV and HCV) (35–37), and less exposure to overdose risks (38). However, the oral use of opioids, that is, by way of smoke inhalation, can produce its own distinct health problems, such as pulmonary dysfunction, asthma, or leukoencephalopathy (39,40). Evidence from several studies indicates that many opioid users begin with noninjection and eventually switch to injection routes, motivated either by economic (for example, seeking more "efficient" modes of use) or by social network dynamics (32,33,41). At the same time, opioid injectors may shift to noninjection forms in search of less risky forms of drug use or as a step in maturing out of their use habits altogether (42). Given the substantially increased levels of risks and harms associated with injection forms of opioid use, both ends of the transition trajectory have enormously important implications for prevention, yet they are little understood or used in interventions (43–45).

### *Health Characteristics*

Illicit opioid users have a range of distinct mortality and morbidity characteristics, the latter category consisting of both physical and mental health dimensions. First, compared with the general population, mortality rates are substantially elevated among illicit opioid users. Mortality is caused primarily by fatal drug overdose and, to a limited extent, by the fatal consequences of infectious disease (for example, HIV and HCV). Mortality rates among illicit opioid users average 1% to 3% yearly, and several studies suggest that 20% to 30% of regular opioid users have experienced at least one nonfatal overdose incident in the past year (26,46,47). Various

predictors of fatal and nonfatal overdose risks have been identified, including drug injection, polysubstance use (including cocaine or benzodiazepines), housing status, or drug use shortly after terminating treatment or release from prison (24,48–50).

Illicit opioid users—especially past or present injectors—show highly elevated prevalence levels of blood-borne infectious disease, specifically HIV and HCV; however, these rates also vary considerably from population to population. The HIV prevalence levels in Canadian IDU populations range from 10% to 35%, whereas HCV infection levels range from 40% to 90% (51,52). In Canada, illicit opioid and other drug users account for about 75% of new HCV infections and 30% of new HIV infections (53,54). Studies on younger and (or) noninjector populations from other jurisdictions have shown rates of HCV infection as low as 38%, illustrating that infectious disease prevalence depends on risk exposure, including age or length of drug career, particular use habits (for example sharing), and the nature of social networks (55,56).

On the mental health side, substantially elevated rates of psychiatric disorders are prevalent in illicit opioid users, defining high levels of comorbidity in this population. Systematic reviews suggest that the prevalence of psychiatric disorders among illicit opioid users ranges from 40% to 80%, with mood disorders—primarily depression—being the most prevalent (57–59). Other studies have also found evidence of elevated levels for other mental health disorders among illicit opioid users, including antisocial personality disorder and posttraumatic stress disorder (60). While there is conflicting evidence regarding the association of sex and comorbidity among opioid users, antisocial personality disorder in particular has been found predominantly among male users (61).

One important implication of the presence and role of psychiatric comorbidity is that a substantial extent of illicit opioid use may need to be understood as a consequence of inadequately diagnosed or treated mental health problems—in many cases a form of depression or emotional pain from which substance users seek relief through psychoactive substance use (62,63). These are the main premises of the self-medication hypothesis (64), which suggests a primary and causal link between opioid use and mood disorders. Relevant for interventions, there is also evidence that opioid users experiencing severe mental health problems are less responsive to substance use treatment and more likely to engage in high-risk behaviours related to their drug use. For example, recent studies demonstrated that users who present depressive

symptoms are more likely to continue using drugs during and after treatment (65) and are more likely to inject, share injection equipment, or engage in polysubstance use (66). Despite the high prevalence of psychiatric comorbidity among illicit opioid users, interventions comprehensively addressing comorbidity are highly limited and in dire need of improvement (67,68).

### *Socioeconomic Characteristics*

Many street-involved illicit opioid users are characterized by one or more of the following socioeconomic characteristics: social marginalization (for example, inadequate housing), illegal income generation, and exposure to the criminal justice system (for example, involvement in crime or incarceration). Generally, large proportions of regular illicit opioid users are not stably housed or are homeless. About one-half of the Toronto sample of illicit opioid users fell into one of these categories (9). A recent study in Ottawa revealed that homeless IDUs who had injected drugs in the previous 6 months were almost 7 times more likely to inject in public places (odds ratio 6.6); they were often characterized by high-risk injecting behaviour and unsterile injection equipment (69). Frequent opioid users typically require considerable sums to finance their drug use habits and do not have sufficient employment income; consequently, many resort to alternative income sources, which usually comprise either some form of social benefit (for example, welfare, disability, or unemployment support payments) or involve an illegal activity—or combinations thereof (70). Crimes committed by illicit opioid users to generate income typically consist of small-scale drug dealing and (or) property offenses and, to a lesser degree, sex-work activities, which are more common among female users (70–72). An Australian study reported that 72% of illicit opioid users ( $n = 307$ ) had been convicted of a minor theft offense, 74% had been convicted of drug possession, and 43% had been convicted of a violent offense (73). In the Toronto sample of opiate users ( $n = 114$ ), close to one-half (47%) had committed a property offense in the last 30 days, with the largest number reporting shoplifting or minor theft (36%); two-thirds of the sample (68%) were involved in the sale or dealing of drugs (70). Comparative systems analysis has shown that the degree to which illicit opioid users are involved in criminal activities may depend on the extent to which social benefits programs are available and suffice to cover their drug expenditures (9,74). Another observed correlation is the increase in criminal activity with more severe drug dependence or more frequent drug use (75,76). Given the extent of criminal involvement among this population, many illicit opioid users indicate past or current involvement with the

criminal justice system. Specifically, large proportions of street-involved illicit opioid users have been arrested, charged, convicted, or have a history of incarceration (9).

The above-mentioned socioeconomic characteristics are important for the broader consequences of illicit opioid use in 2 ways. First, the evidence underscores the critical linkage of social characteristics and morbidity or mortality outcomes among high-risk drug users. For example, homelessness or incarceration status have been found to predict both infectious disease transmission and overdose occurrence in illicit opioid and other drug users (50,69,77,78). Second, from a social cost perspective, the economic costs of crime (that is, victimization) and criminal justice expenditures (that is, policing, courts, and corrections) comprise most (about 80%) of the social cost burden imposed on society by illicit opioid use (79,80). Consequently, programs and policies with an interest in reducing this societal burden ought to support interventions that effectively lower activities and harms related to illicit opioid use in these areas.

### **Treatment**

In Canada and other Western countries, opioid maintenance treatment has for several decades been the main treatment response for illicit opioid dependence (8,82). Although this has largely been limited to MMT, increased diversification of opioid maintenance treatment has been witnessed since the early 1990s and includes alternative maintenance modalities such as buprenorphine, morphine, and even injectable heroin (28,83). In Canada, MMT was heavily restricted owing to pressures from law enforcement and medical sectors in the 1970s; only a fundamental liberalization of treatment controls rendered it once again more broadly accessible in the mid 1990s (82). In British Columbia, Ontario, and Quebec, the number of patients enrolled in MMT subsequently increased about fivefold. Further, several provinces (Alberta, New Brunswick, and Nova Scotia) initiated MMT programming in the past 10 years (84,85). Altogether, it is estimated that around 25 000 to 30 000 individuals (or 20% to 30% of the estimated illicit opioid user population) receive MMT at any given time in Canada, resulting in a user–treatment ratio that is, however, still lower than the ratio in countries with the most advanced treatment systems (28,85). Recent concerns relate to the quality of treatment in MMT and focus on high patient numbers as well as on the possible role of methadone in the increasing numbers of drug overdoses in Ontario (86).

Although the much-expanded availability of MMT across Canada represents major progress for treatment, the population-wide utility of MMT as the sole treatment option is

limited. Studies from various countries indicate that a large proportion—estimates range from 30% to 70%—of MMT patients stop treatment within the first 12 to 24 months (87,88). In Ontario, between 1996 and 2001, it was observed that a substantial proportion of MMT patients either remained in treatment for only a short period of time or reported multiple intermittent treatment episodes (89). Hence, MMT often functions as a revolving door, with patients frequently moving in and out of treatment (89–91). Various studies have illuminated patients' subjective experiences and discontent with MMT. Key issues include the pharmacologic properties and physical–emotional side effects of methadone, the absence of injecting, dosing, and (or) take-home restrictions, and the overall treatment requirements (92–94). Despite highly prevalent polydrug use among illicit opioid users, MMT does not offer therapeutic value for nonopioid drug dependence; nevertheless, MMT patients are typically expected to reduce or quit their use of these substances. That said, various studies have documented that many MMT patients increase their cocaine or crack use in an attempt to counteract methadone's undesirable side effects, resulting in questionable overall treatment benefits or leading to treatment penalties up to the extreme of expulsion (88,95,96).

As of 2005, buprenorphine has been licensed in Canada for use in opioid maintenance treatment (97), which will provide for some possible treatment diversification (98,99), although doubts have been raised about its additional treatment benefits. Systematic reviews indicate that the overall effectiveness of both high and low dosages of buprenorphine is less than that of methadone, particularly when treatment retention is a main outcome (100,101). Further, buprenorphine has been shown to be less or, at best, equally cost-effective when compared with methadone (102,103). The existing divergent interpretations regarding the relative merit of buprenorphine treatment (104) also illustrate that, apart from therapeutic interests, this discussion is also heavily influenced by economic and corporate interests or by the dynamics of an “opioid-treatment industry.”

In 2005, a randomized clinical trial was initiated to compare the effectiveness of injection-heroin prescription with MMT among injecting, opioid-dependent, treatment-refractory users in Vancouver and Montreal (the North American Opiate Medication Initiative, 105). The results of this study, expected in 2007, may offer the empirical grounds to consider further diversification of the opioid-treatment landscape in Canada by heroin maintenance, as has occurred in other countries (106,107).

## Illicit Opioids in Canada: The OPICAN Study

A multisite cohort study to assess the social, health, and drug use characteristics of illicit opioid and other drug users not currently in treatment (the OPICAN study) was initiated in 2002 in the cities of Vancouver, Edmonton, Toronto, Montreal, and Quebec (108). The study administered an identical research protocol at each site, comprising an interviewer-administered questionnaire on socioeconomic, health, and drug use indicators; a standardized mental health instrument (the CIDI-SF for depression); saliva-antibody tests for infectious disease (that is, HIV and HCV); and selected other assessment tools. Eligibility criteria included regular illicit opioid use in the past year, not being in addiction treatment in the past 6 months, and being aged 18 years or older. Recruitment was based on community-based snowball methods, that is, study recruitment posters and handouts in the community. Participants were screened by telephone for eligibility and then invited for an anonymous and confidential personal interview. Participants provided informed consent, completed a saliva confirmation test for illicit opioid use, were paid a participation fee, and were invited for follow-up assessments. Baseline data reported in this article were collected in 2002 and analyzed centrally. The overall baseline analysis sample comprised 679 subjects; specific analyses were based on reduced samples as specified in the reference studies.

Below, we present a select synopsis of results of the OPICAN study (baseline). The synopsis is based on data reported by Fischer and colleagues (108) unless otherwise indicated by way of the corresponding references.

## Overview of Data and Results

### *Drug Use*

Most study participants currently used various illicit opioids, yet they also used a range of illicit nonopioid substances. Heroin use was highly prevalent in the larger cities of Vancouver (91%) and Montreal (90%), and to a lesser extent in Toronto (53%), whereas participants in the smaller cities of Edmonton (28%) and Quebec (37%) were largely characterized by use of illicit prescription opioids (for example, hydromorphone, Demerol, or Tylenol 3 or 4). Highly prevalent other drug use included alcohol, cannabis, and benzodiazepines, as well as cocaine and crack, although for the latter, again, substantial local differences emerged. For example, cocaine use was most prevalent in the Montreal (69%) and Quebec (79%) samples, whereas crack use was most prevalent in Vancouver (87%), Edmonton (67%), and Toronto (62%). Consistently, most participants in each site reported the combined use of opioid and nonopioid drugs (for example, speedballs). Each site was

home to minorities of participants who were not currently using drugs by injection (this minority was largest in Toronto, at 35%); as well, a minority of the cohort (26%) had shared injection equipment in the past month. Several in-depth analyses revealed further interesting dynamics related to drug use within the study cohort. First, a latent class analysis suggested that OPICAN cohort participants could be divided into 3 distinctly different drug-user groups characterized primarily by heroin and cocaine injection use, other opioid and benzodiazepine use, and noninjected other opioid and crack use (109). Second, a specific examination of those who also used crack, compared with those who did not also use crack, revealed that the former were significantly more likely to be characterized by key indicators of social and health risks or harms, including unstable housing, criminal activity, health problems, and injection risks (110). Finally, a more detailed examination of the current noninjectors in the cohort revealed that most had an injection history and were older, suggesting that they had matured out of drug use by injection (43).

### *Health Status, Risks, and Care*

The OPICAN sample overall displayed considerably compromised physical health status. About one-half of respondents reported their health status to be fair or poor, and 7 of 10 participants reported at least one serious health problem (most prevalently, hepatitis and “pain”). HIV prevalence ranged from 11.8% (Quebec) to 20.3% (Vancouver); HCV prevalence ranged from 35.3% (Montreal) to 66.3% (Vancouver). About 1 in 5 participants reported that they had experienced at least a single (nonfatal) overdose incident in the 6 months prior to assessment, representing an additional health risk indicator. Further in-depth analysis of these overdose incidents revealed that they were predicted by various factors, including unstable housing, noninjection use of hydromorphone (a proxy of benzodiazepine use), and exposure to drug treatment in the past 6 months (111). A systematic comparison of the HCV-positive and HCV-negative cases in the sample demonstrated that these groups differed on several key measures, including injection history, age, opioid use combined with other drugs, recent drug treatment, and incarceration (112).

The sample also indicated a considerable prevalence of mental health issues. About one third of the sample self-reported that they had mental health problems; one-half indicated major depressive disorder symptoms according to the CIDI-SF for depression. Further in-depth analysis showed that the prevalence of depressive symptoms was predicted by female sex, white ethnicity, and site (non-Vancouver sites). In

addition, depressive symptoms were associated with the health risks of sharing injection paraphernalia, having experienced an overdose in the past 6 months, and more frequent cocaine use (113).

In terms of health or addiction care, about one-half of the sample had visited a walk-in clinic or emergency department in the past 6 months; 7 of 10 participants had visited a needle exchange site in that period. About one-quarter of the sample had used some form of addiction treatment in the past year, one-half of which included methadone treatment. Three of 10 participants had sought addiction treatment in the past year but were unable to find or access the care they sought.

### *Socioeconomic Indicators*

The OPICAN cohort's average age was 35 years. Most participants were men and described their ethnicity as white. Over one-half of the sample lived in either transitional–unstable housing or were homeless. Although about 7 of 10 participants received income from some form of social benefit program (for example, welfare, disability, or social assistance), only 1 in 5 reported income from legal work. Over one-half of the sample had some form of illegal income; specifically, 27% reported drug dealing, 16% reported property crime, and 21% reported sex work or hustling activities for income generation (114). One-half of the sample had been arrested at least once, and about 2 in 5 had been in detention in the past year. A series of in-depth analyses suggested that illegal income-generation activities were associated with various social and drug use factors. For example, property crime activity in the sample was predicted by frequency of heroin, cocaine, and crack use; male sex; housing status (nonpermanent); and past involvement in crime (114).

### **Discussion**

Several key implications arise from this review. Overall, for Canada and beyond, an epidemiologic reconceptualization of the problem of illicit opioid use is urgently needed. As shown above, illicit opioid use continues to occur in high-risk drug user populations (for example, street-drug users). Nevertheless, this use is by far not limited to these populations and is increasingly present in general (for example, household) populations, although few specific data exist for Canada on the characteristics of such use, its causes, and its consequences (11,14,108). However, it is urgent to collect such data systematically, for both prevention and intervention purposes.

In looking more closely at illicit opioid use in the better-documented problem populations (such as street-drug users) in Canada and elsewhere, 3 key facts become evident. First,

illicit opioid use has become diversified and heterogeneous in terms of the kinds of opioids consumed, with potent prescription opioids originating from the medical system playing an increasingly prevalent role (9,12,115). Although heroin is central in some (primarily larger urban centre) populations, illicit opioid users almost exclusively rely on prescription opioids in other areas. There is little clarity on what determinants shape these distinct local profiles and the markets supporting them, although likely both economic and ecologic factors play a role (116). An important implication of this observation is that illicit opioid use will only be effectively controlled when the substantial amounts of opioids flowing from the medical into the illicit distribution systems are effectively regulated.

Further, illicit opioid use evidently does not occur in isolation but, typically, within a complex profile of polysubstance use—one that, for example, specifically involves the co-use of cocaine–crack, benzodiazepines, or alcohol. Some understanding exists of the desirable interaction effects that lead users to actively seek the combination of opioid and nonopioid substances (20). However, it is also documented that such combinations in many instances pose major additional risks for morbidity or mortality (for example, infectious disease transmission or overdose) and, hence, make interventions more urgent (5,23,117). Given the epidemiologic and harm-outcome realities of illicit opioid use in the context of polydrug use, it is of great concern that existing therapeutic interventions—currently limited largely to MMT—offer few, if any, benefits for nonopioid use and, in many instances, either exacerbate nonopioid drug use or lead to treatment complications (88,95). With these realities in mind, the usefulness of new treatments urgently needs to be investigated and treatments that have proven to be beneficial applied. Specifically, the existing international evidence for buprenorphine maintenance as a new opioid maintenance agent introduced for Canada suggests that it has little additional value when compared with MMT. The benefits of medical heroin prescription are currently being investigated.

The health of illicit opioid users is typically severely compromised, and the dynamics of comorbidities, both in the mental and in the physical health realm, are complex and a major challenge for interventions. As shown by the OPICAN study and other data, depressive symptoms and other mental health problems are disproportionately prevalent among illicit opioid users (58,113). Importantly, the cause-and-effect chain between these symptom areas may point in both directions, meaning that illicit opioid use may lead to mental health problems but also that mental health problems may lead to illicit

opioid use (for example, via self-medication) (64,67). These circumstances underscore the need for extensive interventions tackling addiction and mental health comorbidities among illicit opioid users—an area that is presently highly underdeveloped and underresourced. The dynamics of comorbidity extend even further, however. As shown by the OPICAN data, opioid users with depressive symptoms indicate higher levels of injection risk behaviour (specifically, equipment sharing) and, hence, infectious disease transmission (113). The complex comorbidity dynamics and need for tailored interventions can be illustrated from a different viewpoint. Of 4 new HCV cases in Canada, 3 are related to illicit drug use (52,53). Hence, providing treatment for HCV-infected illicit-drug users is essential from both a public health and a clinical perspective. Although longstanding ideological and clinical concerns about including drug users in HCV treatment have gradually been addressed (118), a key remaining issue is that depression is a major side effect of HCV pharmacotherapy—which, in the case of illicit opioid users, may initiate a vicious cycle: the onset or amplification of depression can lead to increased drug use, which in turn can lead to possible repeated exposure to HCV, rendering treatment efforts potentially futile. That said, treatment studies have indicated that such dynamics can proactively and effectively be addressed, leading to successful treatment of HCV-infected illicit drug users and low levels of subsequent reinfection—if the issue is addressed through the close collaboration of interdisciplinary experts, that is, addiction, infectious disease, and psychiatric specialists (119–121). In other words, illicit opioid use and other drug use-related health problems typically tend not to be limited to addictive symptoms but, rather, cross different areas of the clinical and public health spectrum and, hence, require that specialist addiction services be closely integrated with other forms of health care.

Finally, on a related point, various analysis outcomes of the OPICAN data have also indicated that, rather than being limited to substance use itself, the key harms associated with illicit opioid use across Canada are crucially associated with determinant factors anchored in the social realm and environment. For example, our data have consistently shown that illicit opioid users characterized by unstable housing or criminal justice sanctions (for example, arrest or detention) are more likely to be at elevated risk for morbidity or mortality related to opioid use (111). The role of social determinants in predicting harm outcomes among drug-using populations has also been demonstrated more broadly (69,121,122). A different perspective on the interactions between individual and social harms is that most social costs related to illicit opioid use in Canada—estimated to be in the range of billions of dollars—are for crime and criminal justice expenditures (79).

From this perspective, it would be shortsighted to interpret the harmful effects of illicit opioid use in ways narrowly restricted to the substance use at hand. These harmful effects need to be understood as the outcomes of dynamics that are partly rooted in the human-created social contexts and responses to the phenomenon. Illicit opioid use is likely to be present in Canadian society for some time, but the latter forces—whether in the form of social support, integration, or legal change—are available for conscious and intended change in the interest of improved public health and welfare.

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### References

1. Courtwright D. A century of American narcotics policy. In: Gerstein D, Harwood H, editors. *Treating drug problems* (Institute of Medicine. Volume 2). Washington (CA): National Academy Press;1992.
2. Wall R, Rehm J, Fischer B, Brands B, Gliksman L, Stewart J, and others. The social cost of untreated opiate use. *J Urban Health* 2001;77:688–722.
3. World Health Organization. *The World Health Report 2002: reducing risks, promoting healthy life*. Geneva (CH): WHO; p 66–7.
4. Remis R, Leclerc P, Routledge R, Taylor C, Bruneau J, Beauchemin J, and others. Consortium to characterize injection drug users in Canada (Montreal, Toronto, and Vancouver). Final report. Toronto (ON): University of Toronto; 1998. p 1–74.
5. Fischer B, Kirst M, Rehm J, Marsh D, Bondy S, Tyndall M. The phenomenon of so-called 'other drug use' among opiate addicts in the North American context: evidence, consequences, questions. In: Westermann B, Bellman G, Jellinek C, editors. *Beigebrauch: offene grenzen der substitution*. Weinheim (DE): BELTZ Deutscher Studien Verlag; 2000. p 95–118.
6. The Office of National Drug Control Policy (ONDCP). Heroin fact sheet: June 2003. Available: [www.whitehousedrugpolicy.gov/publications/factsht/heroin/](http://www.whitehousedrugpolicy.gov/publications/factsht/heroin/). Accessed 2006 June 23.
7. Hall W, Ross A, Lynskey M, Law, Degenhardt L. How many dependent opioid users are there in Australia? *The Medical Journal of Australia* 2000;173:528–31. Available: [www.mja.com.au/public/issuues/173\\_10\\_201100/hall/hall.html](http://www.mja.com.au/public/issuues/173_10_201100/hall/hall.html). Accessed 2006 June 23.
8. EMCDDA European Monitoring Centre for Drugs and Drug Addiction. *Annual report 2005: the state of the drugs problem in Europe*. Lisbon (PT): EMCDDA; 2005.
9. Fischer B, Medved W, Gliksman L, Rehm J. Illicit opiates in Toronto: a profile of current users. *Addiction Research* 1999;7:377–415.
10. Brands B, Blake J, Sproule B, Gourlay D, Busto U. Prescription opioid abuse in patients presenting for methadone maintenance treatment. *Drug Alcohol Depend* 2004;73:199–207.
11. Compton W, Volkow N. Major increases in opioid analgesic abuse in the United States: Concerns and strategies. *Drug Alcohol Depend* 2006;81:103–7.
12. Zaczyn J, Bigelow G, Compton P, Foley K, Iguchi M, Sannerud C. College on Problems of Drug Dependence taskforce on prescription opioid nonmedical use and abuse: position statement. *Drug Alcohol Depend* 2003;69:215–32.
13. Cicero TJ, Inciardi JA, Munoz A. Trends in abuse of oxycotin and other analgesics in the United States: 2002–2004. *J Pain* 2005;6:662–72.
14. Haydon E, Rehm J, Fischer B, Monga N, Adlaf E. Prescription drug abuse in Canada and the diversion of prescription drugs into the illicit drug market. *Can J Public Health* 2005;96:459–61.
15. Adlaf E, Begin P, Sawka E. Canadian Addiction Survey (CAS): a national survey of Canadians' use of alcohol and other drugs: prevalence of use and related harms. A detailed report. Ottawa (ON): Canadian Centre on Substance Abuse; 2005.
16. OxyContin Task Force. *OxyContin Task Force: final report*. Newfoundland and Labrador. St John's (NL): Provincial Government of Newfoundland and Labrador; 2004.
17. International Narcotics Control Board. *Statistical information on narcotic drugs: part four*. Vienna (AT): INCB; 2004.

18. Darke S, Ross J. Polydrug dependence and psychiatric comorbidity among heroin injectors. *Drug Alcohol Depend* 1997;48:135–41.
19. Spittal P, Craib K, Wood E, Laliberté N, Li K, Tyndall MW, and others. Risk factors for elevated HIV incidence rates among female injection drug users in Vancouver. *CMAJ* 2002;166:894–9.
20. Leri F, Bruneau J, Stewart J. Understanding polydrug use: reviewing heroin and cocaine use. *Addiction* 2003;98(1):7–22.
21. Archibald CP, Ofner M, Strathdee SA, Patrick D, Sutherland D, Rekart M, and others. Factors associated with frequent needle exchange program attendance in injection drug users in Vancouver, Canada. *J Acquir Immune Defic Syndr Hum Retrovirol* 1998;17:160–6.
22. Patrick DM, Tyndall MW, Cornelisse PG, Li K, Sherlock C, Rekart M, and others. Incidence of hepatitis C virus infection among injection drug users during an outbreak of HIV infection. *CMAJ* 2001;165:889–95.
23. Bourgeois P, Bruneau J. Needle exchange, HIV infection, and the politics of science: confronting Canada's cocaine injection epidemic with participant observation. *Med Anthropol* 2000;18:325–50.
24. Brugal M, Barrio G, de la Fuente L, Regidor E, Royuela L, Suelves J. Factors associated with nonfatal heroin overdose: assessing the effect of frequency and route of heroin administration. *Addiction* 2002;97:319–27.
25. Tardiff K, Marzuk P, Leon A, Portera L, Hartwell N, Hirsch C, and others. Accidental fatal drug overdoses in New York City: 1990–1992. *Am J Drug Alcohol Abuse* 1996;22:135–46.
26. Darke S, Ross J, Hall W. Overdose among heroin users in Sydney, Australia: I. Prevalence and correlates of nonfatal overdoses. *Addiction* 1996;91:405–11.
27. Powis B, Strang J, Griffiths P, Taylor C, Williamson S, Fountain J, and others. Self-reported overdose among injecting drug users in London: extent and nature of the problem. *Addiction* 1999;94:471–8.
28. Fischer B, Rehm J, Kirst M, Casas M, Hall W, Krauz M, and others. Heroin-assisted treatment as a response to the public health problem of opiate dependence. *Eur J Public Health* 2002;12:228–34.
29. Strang J, Griffiths P, Powis B, Gossop M. Heroin chasers and heroin injectors: differences observed in a community sample in London, UK. *Am J Addict* 1999;8:148–60.
30. Smyth B, O'Brien M, Barry J. Trends in treated opiate misuse in Dublin: the emergence of chasing the dragon. *Addiction* 2000;95:1217–23.
31. Carpenter M, Chutuape M, Stitzer M. Heroin snorters versus injectors: comparison on drug use and treatment outcome in age-matched samples. *Drug Alcohol Depend* 1998;53(1):11–5.
32. Swift W, Maher L, Sunjic S. Transitions between routes of heroin administration: a study of Caucasian and Indochinese heroin users in south-western Sydney, Australia. *Addiction* 1999;94(1):71–82.
33. Neaigus A, Miller M, Friedman SR, Hagan DL, Sifaneck SJ, Ildefonso G, and others. Potential risk factors for the transition to injection among noninjecting heroin users: a comparison of former injectors and never injectors. *Addiction* 2001;96:847–60.
34. Barrio G, de la Fuente L, Lew C, Royuela L, Bravo MJ, Torrens M. Differences in severity of heroin dependence by route of administration: the importance of length of heroin use. *Drug Alcohol Depend* 2001;63:169–77.
35. Quaglio G, Lugoboni F, Pajusco B, Sarti M, Talamini G, Lechi A, and others. Factors associated with hepatitis C virus infection in injection and noninjection drug users in Italy. *Clin Infect Dis* 2003;37(1):33–40.
36. Chitwood DD, Comerford M, Sanchez J. Prevalence and risk factors for HIV among sniffers, short-term injectors, and long-term injectors of heroin. *J Psychoactive Drugs* 2003;35:445–53.
37. Razak MH, Jititwitikarn J, Suriyanon V, Vongchack T, Srirak N, Beyrer C, and others. HIV prevalence and risks among injection and noninjection drug users in northern Thailand: need for comprehensive HIV prevention programs. *JAIDS* 2003;33:259–66.
38. Darke S, Ross J. Fatal heroin overdoses resulting from noninjecting routes of administration, NSW, Australia, 1992–1996. *Addiction* 2000;95:569–73.
39. Buster M, Rook L, van Brussel H, Van Ree J, van den Brink W. Chasing the dragon related to impaired lung function among heroin users. *Drug Alcohol Depend* 2002;68:221–8.
40. Cygan J, Trunsky M, Cobridge T. Inhaled heroin-induced status asthmaticus: five cases and a review of the literature. *Chest* 2000;117:272–5.
41. Maxwell JC, Spence RT. An exploratory study of inhalers and injectors who used black tar heroin. *Journal of Maintenance in the Addictions* 2005;3(1):61–82.
42. Gossop M, Stewart D, Marsden J, Kidd T, Strang J. Changes in route of drug administration among continuing heroin users: outcomes 1 year after intake to treatment. *Addict Behav* 2004;29:1085–94.
43. Fischer B, Manzoni P, Rehm J. Comparing injecting and noninjecting illicit opioid users in a multisite Canadian sample (OPICAN cohort). *European Addiction Research*. Forthcoming.
44. Griffiths P, Gossop M, Powis B, Strang J. Transitions in patterns of heroin administration: a study of heroin chasers and heroin injectors. *Addiction* 1994;89:301–9.
45. Galai N, Safaeian M, Vlahov D, Bolotin A, Celentano DD. Longitudinal patterns of drug injection behavior in the ALIVE study cohort, 1988–2000: description and determinants. *Am J Epidemiol* 2003;158:695–704.
46. Bennett G, Higgins D. Accidental overdose among injecting drug users in Dorset, UK. *Addiction* 1999;94:1179–90.
47. Hser Y, Anglin M, Powers K. A 24-year follow-up of California narcotics addicts. *Arch Gen Psychiatry* 1993;50:577–84.
48. Darke S, Hall W. Heroin overdose: research and evidence-based intervention. *J Urban Health* 2003;80:189–200.
49. McGregor C, Darke S, Ali R, Christie P. Experience of nonfatal overdose among heroin users in Adelaide, Australia: circumstances and risk perceptions. *Addiction* 1998;93:701–11.
50. Seaman S, Brettler R, Gore S. Mortality from overdose among injecting drug users recently released from prison: database linkage study. *BMJ* 1998;316:426–8.
51. Zou S, Tepper M, Giulivi A. Current status of hepatitis C in Canada. *Can J Public Health* 2000;91(Suppl 1):S10–S21.
52. Fischer B, Haydon E, Rehm J, Kraiden M, Reimer J. Injection drug use and the hepatitis C virus: considerations for a targeted treatment approach—the case study of Canada. *J Urban Health* 2004;81:428–47.
53. Remis R. A study to characterize the epidemiology of hepatitis C infection in Canada, 2002. Final report. Ottawa (ON): Health Canada; 2004.
54. Geduld J, Gatali M, Remis R, Archibald C. Estimates of HIV prevalence and incidence in Canada, 2002. *Can Commun Dis Rep* 2003;29:197–207.
55. Garfein R, Doherty MC, Monterroso ER, Thomas DL, Nelson K, Vlahov D. Prevalence and incidence of hepatitis C virus infection among young adult injection drug users. *J Acquir Immune Defic Syndr Hum Retrovirol* 1998;18(Suppl.1):S11–S19.
56. Wiessing L, Roy K, Sapinho D, Hay G, Taylor A, Goldberg D, and others. Surveillance of hepatitis C infection among injecting drug users in the European Union. In: Jager J, Limburg W, Kretzschmar M, Postma M, Wiessing L, editors. *EMCDDA monographs: hepatitis C and injection drug use: impact, costs and policy options*. Lisbon (PT): EMCDDA; 2004. p 91–135.
57. Strain E. Assessment and treatment of comorbid psychiatric disorders in opioid-dependent patients. *Clin J Pain* 2002;18(4):S14–S27.
58. Krausz M, Verthein U, Degkwitz P. Psychiatric comorbidity in opiate addicts. *Eur Addict Res* 1999;5:55–62.
59. Frei A, Rehm J. Die Prävalenz psychischer Komorbidität unter Opiatabhängigen: eine Metaanalyse bisheriger Studien. *Psychiatrische Praxis* 2002;29:258–62.
60. Compton W, Conway KP, Stinson FS, Colliver JD, Grant B. Prevalence, correlates, and comorbidity of dsm-iv antisocial personality syndromes and alcohol and specific drug use disorders in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry* 2005;66:677–85.
61. Kidorf M, Disney E, King V, Neufeld K, Beilenson P, Brooner R. Prevalence of psychiatric and substance use disorders in opioid abusers in a community syringe exchange program. *Drug Alcohol Depend* 2004;74:115–22.
62. Rosenblum A, Joseph H, Fong C, Kipnis S, Clement N, Portenoy R. Prevalence and characteristics of chronic pain among chemically dependent patients in methadone maintenance and residential treatment facilities. *JAMA* 2003;289:2370–8.
63. Chabal C, Erjavec M, Jacobson L, Mariano A, Chaney E. Prescription opiate abuse in chronic pain patients: clinical criteria, incidence, and predictors. *Clin J Pain* 1997;13:150–5.
64. Khantzian E. The self-medication hypothesis of substance use disorders: a reconsideration and recent applications. *Harv Rev Psychiatry* 1997;4:231–44.
65. Brewer D, Catalano R, Haggerty K, Gainey R, Fleming C. A meta-analysis of predictors of continued drug use during and after treatment for opiate addiction. *Addiction* 1998;93(1):73–92.
66. Mandell W, Kim J, Latkin C, Suh T. Depressive symptoms, drug network, and their synergistic effect on needle-sharing behavior among street injection drug users. *American Journal of Alcohol Abuse* 1999;25:117–27.
67. Brady KT, Malcolm RJ. Substance use disorders and cooccurring axis I psychiatric disorders. In: Galanter M, Kleber HD, editors. *Textbook of substance abuse treatment*. Washington (DC): American Psychiatric Publishing; 2004.
68. Charney DA, Paraherakis AM, Gill KJ. Integrated treatment of comorbid depression and substance use disorders. *J Clin Psychiatry* 2001;62:672–7.
69. Navarro C, Leonard L. Prevalence and factors related to public injecting in Ottawa, Canada: implications for the development of a trial safer injecting facility. *International Journal of Drug Policy* 2004;15:275–84.
70. Fischer B, Medved W, Kirst M, Rehm J, Gliksmann L. Illicit opiates and crime: results of an untreated user cohort study in Toronto. *Can J Criminol* 2001;43:197–217.
71. Johnson B, Goldstein P, Preble E, Schmeidler J, Lipton DS, Spunt B, and others. Taking care of business: the economics of crime by heroin abusers. Lexington (KY): Lexington Books; 1985.
72. Nurco D, Ball J, Shaffer J, Hanlon T. The criminality of narcotic addicts. *J Nerv Ment Dis* 1985;173:94–102.
73. Kaye S, Darke D, Finlay-Jones R. The onset of heroin use and criminal behaviour: does order make a difference? *Drug Alcohol Depend* 1998;53:79–86.
74. Grapendaal M. Cutting their coat according to their cloth: economic behaviour of Amsterdam opiate users. *Int J Addict* 1992;27:487–501.

75. Anglin M, Perrochet B. Drug use and crime: a historical review of research conducted by the UCLA drug abuse research center. *Subst Use Misuse* 1998;33:1871–914.
76. Speckert GR, Anglin MD. Narcotics and crime: a causal modeling approach. *Journal of Quantitative Criminology* 1986;2:3–28.
77. Jones R, Gruer L, Gilchrist G, Seymour A, Black M, Oliver J. Recent contact with health and social services by drug misusers in Glasgow who died of a fatal overdose in 1999. *Addiction* 2002;97:1517–22.
78. Smerek GA, Hockman EM. Prevalence of HIV infection and HIV risk behaviors associated with living place: on-the-street homeless drug users as a special target population for public health intervention. *Am J Drug Alcohol Abuse* 1998;24:299–319.
79. Fischer B. Illegale Opiatsucht, behandlung und ökonomische kostenforschung—ein beispielhafter überblick und eine diskussion aus sozialwissenschaftlicher perspektive. *Suchttherapie* 2003;4:2–7.
80. Frei A, Greiner R, Mehnert A, Dinkel R. Socioeconomic evaluation of the trials for the medical prescription of opiates, final report. In: Gutzwiller F, Steffen T, editors. *Cost benefit analysis of heroin maintenance treatment*. Basel (CH): Karger Verlag; 2000. p 37–130.
81. Ward J, Hall W, Mattick R. Role of methadone maintenance in opioid dependence. *Lancet* 1999;353:221–6.
82. Fischer B. Prescriptions, power and politics: the turbulent history of methadone maintenance in Canada. *J Public Health Policy* 2000;21:187–210.
83. Ling W, Wesson D, Charuvastra C, Klett J. A controlled trial comparing buprenorphine and methadone maintenance in opioid dependence. *Arch Gen Psychiatry* 1996;53:401–7.
84. Strike C, Urbanoski K, Fischer B, Marsh D, Millson P. Policy changes and the methadone maintenance treatment system for opioid dependence in Ontario, 1996–2001. *J Addict Dis* 2005;24(1):39–51.
85. Popova S, Rehm J, Fischer B. An overview of illegal opioid use and health services utilization in Canada. *Public Health* 2006;120:320–8.
86. Fischer B, Popova L, Rehm J, Ivins A. Drug use related overdose mortality in British Columbia and Ontario, 1992–2002. *Can J Public Health*. Forthcoming.
87. Bertschy G. Methadone maintenance treatment: an update. *Eur Arch Psychiatry Clin Neurosci* 1995;245:114–24.
88. Fischer B, Rehm J, Kim G, Kirst M. Eyes wide shut? A conceptual and empirical critique of methadone maintenance treatment. *Eur Addict Res* 2005;11(1):1–12.
89. Strike C, Gnam W, Urbanoski K, Fischer B, Marsh DC, Millson M. Factors predicting 2-year retention in methadone maintenance treatment for opioid dependence. *Addictive Behaviors* 2005;30:1025–8.
90. Bell J, Burrell T, Indig D, Gilmour S. Cycling in and out of treatment; participation in methadone treatment in NSW, 1990–2002. *Drug Alcohol Depend* 2006;81:55–61.
91. Anderson J, Warren L. Client retention in the British Columbia methadone program, 1996–1999. *Can J Public Health* 2004;95:104–9.
92. Fischer B, Chin A, Kuo I, Kirst M, Vlahov D. Canadian illicit opiate users' views on methadone and other opiate prescription treatment: an exploratory qualitative study. *Subst Use Misuse* 2002;37:495–522.
93. Hunt D, Lipton D, Goldsmith D, Strug D. Problems in methadone treatment: the influence of reference groups. *NIDA Res Monogr* 1984;46:8–21.
94. Stancliff S, Myers J, Steiner S, Drucker E. Beliefs about methadone in an inner-city methadone clinic. *J Urban Health* 2002;79:571–8.
95. Best D, Harris J, Gossop M, Farrell M, Finch E, Noble A, and others. Use of nonprescribed methadone and other illicit drugs during methadone maintenance treatment. *Drug Alcohol Rev* 2000;19:9–16.
96. Kolar A, Brown B, Weddington W, Ball J. A treatment crisis: cocaine use by clients in methadone maintenance programs. *J Subst Abuse Treat* 1990;7:101–7.
97. CNW Group. First new opiate addiction treatment in over 40 years: subutex(R) changes landscape for opiate addiction treatment. Available: [www.newswire.ca/en/releases/archive/February2005/11/c3086.html](http://www.newswire.ca/en/releases/archive/February2005/11/c3086.html). Accessed 2006 June 27.
98. Marsch LA, Stephens MA, Mudric T, Strain EC, Bigelow GE, Johnson RE. Predictors of outcome in LAAM, buprenorphine, and methadone treatment for opioid dependence. *Exp Clin Psychopharmacol* 2005;13:293–302.
99. Strain E, Stitzer M, Liebson I, Bigelow G. Comparison of buprenorphine and methadone in the treatment of opioid dependence. *Am J Psychiatry* 1994;151:1025.
100. Amato L, Davoli M, Perucci C, Ferri M, Faggiano F, Mattick R. An overview of systematic reviews of the effectiveness of opiate maintenance therapies: available evidence to inform clinical practice and research. *J Subst Abuse Treat* 2005;28:321–9.
101. Mattick R, Breen C, Kimber J, Davoli M. Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence (Cochrane Review). *Cochrane Library* 2. Chichester (UK): John Wiley & Sons Ltd; 2004.
102. Harris A, Gospodarevskaya E, Ritter A. A randomised trial of the cost effectiveness of buprenorphine as an alternative to methadone maintenance treatment for heroin dependence in a primary care setting. *Pharmacoeconomics* 2005;23(1):77–91.
103. Doran C, Shanahan M, Mattick R, Ali R, White J, Bell J. Buprenorphine versus methadone maintenance: a cost-effectiveness analysis. *Drug Alcohol Depend* 2003;71:295–302.
104. Sung S, Conry JM. Role of buprenorphine in the management of heroin addiction. *Ann Pharmacother* 2006;40:501–5.
105. Schechter MT. NAOMI—her time has come. *North American Opiate Medication Initiative*. *J Urban Health* 2002;79:164–5.
106. van den Brink W, Hendriks V, Blanken P, Koeter M, van Zwieten B, van Ree J. Medical prescription of heroin to treatment resistant heroin addicts: two randomised controlled trials. *BMJ* 2003;327:310–5.
107. Bammer G, Dobler-Mikola A, Fleming P, Strang J, Uchtenhagen A. The heroin prescribing debate: integrating science and politics. *Science* 1999;284:1277–8.
108. Fischer B, Rehm J, Brissette S, Brochu S, Bruneau J, el-guebaly N, and others. Illicit opioid use in Canada: comparing social, health and drug use characteristics of untreated users in five cities (OPICAN study). *J Urban Health* 2005;82:250–66.
109. Monga N, Rehm J, Fischer B, Brissette S, Bruneau J, el-Guebaly N, and others. [Using latent class analysis (LCA) to analyze patterns of drug use in a population of illicit opioid users. 2005]. Located at Centre for Addiction and Mental Health, Toronto (ON).
110. Fischer B, Monga N, Manzoni P. Differences between couers of cocaine and crack among Canadian illicit opioid users. *Sucht* 2005;51:217–24.
111. Fischer B, Brissette S, Brochu S, Bruneau J, el-Guebaly N, Noel L, and others. Prevalence and determinants of overdose incidents among illicit opioid users in five cities across Canada. *CMAJ* 2004;171:235–9.
112. Firestone Cruz M, Fischer B, Kalousek K, Newton-Taylor B, Rehm J, Tyndall M. Prevalence and associated factors of Hepatitis C infection (HCV) in a multisite Canadian population of illicit opioid and other drug users (OPICAN). 2006. *Can J Public Health*. Forthcoming.
113. Wild C, el-Guebaly N, Fischer B, Brissette S, Brochu S, Bruneau J, Noel L, Rehm J, and others. Comorbid depression among opiate users: results from a multisite Canadian study. *Can J Psychiatry* 2005;50:512–8.
114. Manzoni P, Brochu S, Fischer B, Rehm J. Determinants of property crime among illicit opiate users outside of treatment across Canada. *Deviant Behav*. Forthcoming.
115. Beswick R, Best D, Rees S, Coomber R, Gossop M, Strang J. Multiple drug use: Patterns and practices of heroin and crack use in a population of opiate addicts in treatment. *Drug Alcohol Rev* 2001;20:201–4.
116. Grzybowski S. The black market in prescription drugs. *Lancet* 2004;364(Suppl):S28–S29.
117. Darke S. Polydrug use and overdose: overthrowing old myths. *Addiction* 2003;98:711.
118. Edlin BR, Kresina TF, Raymond DB, Carden M, Goureritch M, Rich J, and others. Overcoming barriers to prevention, care, and treatment of hepatitis C in illicit drug users. *Clin Infect Dis* 2005;40(Suppl 5):S276–S285.
119. Sylvestre DL. Treating hepatitis C virus infection in active substance users. *Clin Infect Dis* 2005;40(Suppl 5):S321–S324.
120. Backmund M, Reimer J, Meyer K, Gerlach JT, Reinhart Z. Hepatitis C virus infection and injection drug users: prevention, risk factors, and treatment. *Clin Infect Dis* 2005;40(Suppl 5):S330–S335.
121. Galea S, Vlahov D. Social determinants and the health of drug users: socioeconomic status, homelessness, and incarceration. *Public Health Rep* 2002;117(Suppl 1):S135–S145.
122. Cheung RC, Hanson AK, Maganti K, Keeffe EB, Matsui SM. Viral hepatitis and other infectious diseases in a homeless population. *J Clin Gastroenterol* 2002;34:476–80.

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**Résumé : Les principales caractéristiques de l'usage des opioïdes illicites : aperçu et données probantes choisis d'une cohorte canadienne multisite d'utilisateurs d'opioïdes illicites (OPICAN)**

**Objectifs :** Résumer les principales caractéristiques et conséquences de l'usage d'opioïdes illicites à partir de la documentation et présenter les données correspondantes d'un échantillon multisite d'utilisateurs d'opioïdes illicites de 5 villes canadiennes (étude OPICAN).

**Méthode :** Nous avons entrepris une revue de la documentation récente d'Amérique du Nord, d'Australie et d'Europe. Nous avons obtenu les données de l'étude de cohorte multicité OPICAN, qui consistait dans un questionnaire administré par un interviewer, un instrument normalisé de santé mentale (la version abrégée de l'entrevue diagnostique composite internationale pour la dépression) et des tests d'anticorps dans la salive de maladies infectieuses (c'est-à-dire, le VIH et le virus de l'hépatite C). L'échantillon de départ ( $n = 679$ ) a été recruté en 2002.

**Résultats :** L'usage d'opioïdes illicites au Canada et ailleurs devient de plus en plus hétérogène en ce qui concerne les drogues opiacées utilisées, l'héroïne jouant un rôle de moins en moins important. Cet usage se produit principalement dans un contexte d'utilisation de polydrogues (par exemple, la cocaïne-crack ou les benzodiazépines). De vastes proportions d'utilisateurs d'opioïdes illicites présentent des comorbidités de santé physique et/ou mentale, y compris des maladies infectieuses et/ou la dépression, et par conséquent, nécessitent des interventions intégrées. Enfin, les risques de morbidité parmi les utilisateurs d'opioïdes illicites sont souvent prédits par des facteurs de marginalisation sociale, par exemple, le logement et la participation au crime.

**Conclusions :** Étant donné le profil épidémiologique et le fardeau de maladie élevé associés avec les formes contemporaines de l'usage d'opioïdes illicites, il y a un besoin urgent d'approches de traitement plus efficaces au Canada et ailleurs. Plus précisément, le traitement doit s'adapter aux réalités de l'usage répandu de polysubstances, mais aussi aborder plus efficacement les comorbidités complexes de santé physique et/ou mentale présentées par cette population à risque élevé.