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in HIV/AIDS

Drug Situation in Vancouver

Report prepared by the
Urban Health Research Initiative of the
British Columbia Centre for Excellence in HIV/AIDS

Second edition
June 2013

UHRI
URBAN HEALTH RESEARCH INITIATIVE

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Executive Summary

Awareness is growing of the importance of developing health policy and practice based on the best available scientific evidence. Despite this, a major disconnect between research, public policy and practice persists in many settings. As a result of the failure to incorporate scientific evidence into policy, various marginalized populations, including people who use illicit drugs (PWUD), remain vulnerable to preventable health-related harms.

Vancouver, Canada, has experienced long-standing epidemics of illicit drug use and HIV. While progress has been made in addressing the epidemics of overdose and HIV infection, other unaddressed drug-related harms persist—in part because of the failure to implement evidence-based policies that address issues related to public health, public disorder and crime. To minimize the harms associated with illicit drug use in Vancouver, it is essential that all stakeholders have access to data pertaining to drug use in the city.

In an effort to close the research–policy gap, scientists from the Urban Health Research Initiative of the British Columbia Centre for Excellence in HIV/AIDS and the University of British Columbia's Division of AIDS have prepared a second report on the scope and extent of Vancouver's drug problems. This report contains 15 years of prospective data on drug use and behavioural trends among some of the city's most vulnerable PWUD, including HIV-positive and HIV-negative PWUD and street-involved youth. The objective of this report is to make data accessible to a wide variety of stakeholders and to directly inform the City of Vancouver's Four Pillars Drug Strategy, the Province of British Columbia's response to illicit drug use, and the Canadian federal government's National Anti-Drug Strategy.

Key Findings

Drug Use Trends: Over the past 15 years, large fluctuations in drug use patterns have been observed. In recent years, there seems to have been an overall decline in illicit drug use. Overall, the prevalence of daily cocaine injection among PWUD has dramatically decreased—from 38.1% in 1996 to 6.9% in 2011. As well, the proportion of PWUD reporting daily heroin injection has declined over the years. This trend is accompanied by a marked increase in the use of other illicit

drugs, including crack cocaine smoking, injection and non-injection crystal methamphetamine use, and prescription opioid injection. The highest prevalence of daily use of these drugs was reported in 2007, with 40.7%, 7.7%, 16.9%, and 30.9% for non-injection crack cocaine, non-injection crystal methamphetamine, crystal methamphetamine injection, and prescription opioid injection, respectively. Following 2007, however, trends in the use of all drugs mentioned have declined. Relative to populations of older PWUD in Vancouver, the daily drug use patterns of street-involved youth in Vancouver between 2005 and 2011 indicate a high prevalence of crystal methamphetamine use, through both injecting and smoking. While the prevalence of crystal methamphetamine use via smoking has been declining over the six-year period, the prevalence of crystal methamphetamine injection has doubled recently, from 4.9% in 2010 to 10.5% in 2011. The prevalence of crack cocaine smoking was also most common among this vulnerable group, with 12% to 18% of street-involved youth reporting daily use of this drug throughout the study period.

Addiction Treatment: There has been a steady increase in the prevalence of reported use of methadone maintenance therapy (MMT) by PWUD, from 11.7% in 1996 to 53.3% in 2011. The highest reported prevalence was observed between 2008 and 2011. This positive trend in access to MMT has been accompanied by a decreasing proportion of PWUD reporting difficulty accessing treatment, from a high of 19.9% in 1996 to 5% in 2011.

Harm Reduction: The dramatic decline in syringe sharing among PWUD in Vancouver can be largely attributed to the expansion of harm reduction programs in the city, with 39.6% of PWUD reporting syringe borrowing in 1996 but only 1.7% reporting syringe borrowing in 2011. Similarly, the prevalence of reported syringe lending also decreased, from a high of 39.2% in 1996 to 1.3% in 2011. This has coincided with a reduction in PWUD reporting difficulty accessing syringes. Consistently, over the past 15 years, an overall decreasing trend in both HIV and HCV incidence rates can be seen, with HIV rates declining from a high of 8.1 cases per 100 person-years in 1997 to 0.37 cases per 100 person-

years in 2011, and HCV rates declining from 37.1 cases per 100 person-years in 1997 to 1.1 cases per 100 person-years in 2011. Considering the public health gains attributable to harm reduction programs locally and internationally, the lack of support for such initiatives in the Canadian federal government's National Anti-Drug Strategy requires greater public discussion.

Law Enforcement & Violence: Throughout Canada, there has been an increasing reliance on drug law enforcement, including efforts to reduce the use and supply of drugs. As a result, a large proportion of PWUD in Vancouver report experiencing incarceration. However, the data suggest that this approach has had minimal impact on illicit drug prices and availability in Vancouver. Between 2000 and 2011, drug prices remained low and stable, with heroin prices at $20 per 0.1 gram and cocaine, crack cocaine and crystal methamphetamine at $10 per 0.1 gram. The availability of these so-called "hard drugs" is comparable to, and in some cases even greater than, the reported availability of marijuana. The data suggest that the availability of these drugs on the street has been unaffected by the implementation of the federal government's National Anti-Drug Strategy. As well, an overall increasing trend has been observed in the availability of prescription opioids, with Tylenol 3 and 4, morphine, and Dilaudid being the most readily available. Specifically, in 2005, 18.9% of PWUD reported rapid access to Tylenol 3 and 4, while 51.4% reported immediate availability in 2011.

Violence remains a problem within the local drug scene, with 14.5% of all PWUD reporting some form of violence in 2011. While reports of beatings and robbery in 2011 declined from 2005, the proportion of PWUD reporting other forms of violence was consistently stable over the six-year period. Furthermore, the available data on violence indicate that there are gender differences with respect to the type of violence reported by PWUD, with a higher proportion of males than females experiencing beatings, attacks with guns or other weapons and robbery. Alternatively, females experienced sexual assault at a much higher proportion than males. Beating was the most prevalent type of attack experienced by both genders.

Housing & Sex Work: Over the last 15 years, the reported prevalence of unstable housing has been relatively consistent, and engagement in sex work is common across the UHRI cohorts. In 2011, 19.3% of HIV-positive PWUD and 20% of HIV-negative people who inject drugs reported sex work in the previous six months. Additionally, 11.7% of street-involved youth in Vancouver were sex workers.

Drug Use Cessation: Patterns of injection drug use cessation as reported by PWUD in Vancouver can be separated into two increasing trends: the first between 1996 and 2005, and the second between 2006 and 2011. This trend can be largely attributed to a replenishment of the cohort that was conducted in 2005. In 2005 and 2011, reports of injection drug use cessation peaked at approximately 47%.

Mortality Rates: Mortality rates remain high among the PWUD population and are often driven by complications arising from HIV infection. In 2008, mortality rates peaked at 5.92 deaths per 100 person-years. However, our data suggest that these rates have since been declining; in 2010, mortality rates were reported as 2.45 deaths per 100 person-years. The data also indicate that the rate of death among PWUD is approximately 8 times higher than that of the general population of British Columbia.

While several indicators suggest that progress has been made locally in lowering HIV infection and drug overdose rates and in increasing access to addiction treatment, there is also evidence of persistently high availability of drugs and high levels of mortality among local PWUD. These data suggest that while programs and policies targeting infectious disease and overdose have been effective, few gains have been made in terms of reducing the supply of drugs. In addition, drug trends are shifting, with fewer PWUD injecting illicit drugs and a larger proportion smoking crack cocaine. The data contained herein will allow for independent assessments of existing policy and programmatic efforts, including the federal government's National Anti-Drug Strategy.

Background

Illicit drug use remains a major public health concern and continues to be associated with a wide array of health- and community-related harms. Infectious disease transmission, fatal overdoses and injection-related infections are common among people who inject drugs (IDU).[1-3] As well, harms that arise from homelessness and criminal activity are frequently observed among this population, given the high exposure of these individuals to street-based drug scenes.[4] Vancouver, Canada, has long been an epicentre of illicit drug use and HIV epidemics, with estimates of HIV prevalence between 17% and 30% among the IDU population.[5, 6] Hepatitis C virus (HCV) infection rates are also extremely elevated among these individuals, and rates have been reported to be as high as 90%.[7, 8]

Shifts in illicit drug use patterns among Vancouver IDU have been documented over the years, with observed declines in the use of heroin and cocaine injection.[9] This trend has been accompanied by an increase in the use of crack cocaine and crystal methamphetamine, particularly among street-involved youth.[10, 11] That growing numbers of street-involved youth are engaging in illicit drug behaviours is concerning, given that while these individuals are highly vulnerable to infectious disease transmission, many perceive themselves to be at low risk for acquiring these diseases.[12-14] Though the Downtown Eastside core is largely concentrated with people who use illicit drugs (PWUD) and is therefore an important geographic location for research, it should also be noted that illicit drug use is highly prevalent throughout Vancouver and British Columbia, as well as across Canada.[15, 16]

In 2007, Canada's Prime Minister Stephen Harper announced that his government was introducing a National Anti-Drug Strategy aimed at reducing the supply and use of illicit drugs.[17] Though a balanced drug prevention and drug treatment approach was promised to the public, a focus on funding and enhancing law enforcement efforts was instead observed.[18] And despite international acceptance of harm reduction strategies as evidence-based approaches to reducing health-related harms among PWUD, the National Anti-Drug Strategy failed to invest resources in harm reduction programs, and harm reduction was removed from the strategy for the first time since

a federal drug strategy was announced in 1987.[18] The federal Conservative government has remained resistant to harm reduction programs such as Insite, Vancouver's first sanctioned supervised injection site. Recently, the Supreme Court of Canada ruled in favour of the continued operation of Insite, despite the federal government's efforts to oppose it.[19, 20]

Despite a large body of evidence documenting the unintended health-related consequences that occur as a result of drug law enforcement approaches, there continues to be a reliance on these strategies in Vancouver. Many IDU and sex workers have reported a high prevalence of police confrontations, particularly in the Downtown Eastside of Vancouver.[21, 22] Fear of police confrontations has also prevented some individuals from accessing harm reduction programs, consequently putting them at higher risk of HIV and HCV transmission.[22, 23] Moreover, the large proportion of PWUD who report a history of incarceration can be explained in part by the continued investment in drug law enforcement throughout Canada.[24] However, because of limited harm reduction programs available within prisons,

incarcerated individuals are at elevated risk for acquiring infectious diseases and other health-related harms.[25] Prior studies have demonstrated that previously incarcerated IDU are more likely to acquire HIV compared to IDU without a history of incarceration.[2, 26, 27] While an increasing proportion of government funding has been shifted towards law enforcement, there continues to be a lack of evidence supporting the effectiveness of this strategy in reducing illicit drug use or supply.[28, 29] Alternatively, there is growing support for drug policies that serve to balance law enforcement with more health-focused interventions.[30, 31]

Untreated illicit drug addiction results in much preventable human suffering and places a massive financial burden on the Canadian health care system. In addition to the high incidence rates of HIV and HCV among the IDU population, these individuals are also at elevated risk of soft tissue infections, overdose and other health harms that often require lengthy and expensive hospitalizations.[32, 33] The average lifetime medical cost of a new case of HIV infection has been reported to be approximately $250,000.[34, 35] Given that HCV infection is more prevalent than HIV among IDU,[36] the total medical costs associated with HCV infection are likely to place a larger economic burden on Canada's health care system compared to HIV. Thus, it is in the public's interest to provide access to evidence-based prevention programs, as well as those programs that provide early diagnosis, treatment and care of these health harms.[37, 38]

BC Centre for Excellence in HIV/AIDS

Beginning in 1996, the British Columbia Centre for Excellence in HIV/AIDS (BC-CfE) initiated an investigation of the HIV outbreak in Vancouver's Downtown Eastside. A prospective cohort study of Vancouver-based IDU was established. This study would later receive funding from the US National Institutes of Health and become known as the Vancouver Injection Drug Users Study (VIDUS). The ongoing VIDUS study involves semi-annual follow-up of cohort participants, who visit a study office located in the Downtown Eastside to be tested for HIV and HCV and to answer a detailed interviewer-administered questionnaire that explores a range of issues facing them and the local community.

Since the launch of VIDUS, the BC-CfE has initiated a number of other studies related to illicit drug use, including studies of street-involved youth and evaluations of the health needs and behaviours of PWUD living with HIV/AIDS.[39, 40] Each of these individual studies, described in detail below, is funded by peer-reviewed grants from various agencies. In 2006, the BC-CfE received a grant from the Canadian Institutes of Health Research to create an urban health and addictions research program that would combine all of these data sources and allow for a comprehensive analysis of the illicit drug situation in Vancouver.

Urban Health Research Initiative

The Urban Health Research Initiative (UHRI) was established in 2007 by the BC-CfE at St. Paul's Hospital in Vancouver. Led by principal investigators Drs. Evan Wood and Thomas Kerr, UHRI is based on a network of studies that were developed to help identify and understand the many factors that affect the health of urban populations. UHRI's mission is *to improve the health of individuals and communities through research to inform policy.* UHRI's research focuses on a range of issues that affect the health of urban populations, with special emphasis placed on infectious diseases such as HIV and HCV, substance use and addiction, health care and social services access, and policies that have a direct bearing on public health, well-being and safety.

Part of UHRI's mandate is to help inform policy decisions using the best available scientific evidence regarding the illicit drug problems in the City of Vancouver. With the implementation of the city's Four Pillars Drug Strategy[41] and the federal government's National Anti-Drug Strategy,[17] it became clear that, to close the gap between evidence and policy, all stakeholders would need access to comprehensive data on the extent of the city's drug problem. To address this need, we present this report, which is based on 15 years of prospective data on drug use (with a focus on so-called "hard drugs" such as cocaine, crack cocaine, heroin and crystal methamphetamine) and related issues among Vancouver PWUD.

Data Sources

Large longitudinal prospective cohort studies represent the most reliable method of obtaining detailed information on the health of communities, and such studies form the basis of the research contained within this report. All of the cohort studies listed below are made up of representative samples of vulnerable populations in Vancouver. Recruitment strategies employ extensive street-based outreach and "snowball" sampling approaches. After initial contact is made, the nature of the study is explained to potential participants, and informed consent is obtained from those who wish to enrol. All studies are approved by the University of British Columbia's Research Ethics Board at its St. Paul's Hospital site.

Participants in all studies provide blood samples and complete interviewer-administered questionnaires at baseline and semi-annually. The survey instruments for all of the cohort studies are largely based on validated international research instruments developed for the measurement of drug-related behaviours. These survey instruments have been coordinated across the cohorts to facilitate the examination of the natural history of illicit drug use from adolescence through to adulthood. All surveys include sections on sources of income, non-injection and injection drug use behaviours, interactions with police, incarceration, sexual activity, drug and alcohol treatment, and violence. The individual studies that comprise the bulk of UHRI research are described below, with the exception of the Scientific Evaluation of Supervised Injecting (SEOSI) cohort; this study is specifically dedicated to the evaluation of Insite, the city's supervised injecting site, and is the subject of other reports available at http://uhri.cfenet.ubc.ca.

VIDUS

The Vancouver Injection Drug Users Study (VIDUS) is UHRI's longest-running cohort study. Beginning in May 1996, persons who had injected illicit drugs at least once in the previous month, resided in the Greater Vancouver region and provided informed consent were recruited into VIDUS. Currently, the VIDUS cohort includes more than 1,200 individuals. Data from this cohort have been the basis of more than 140 published scientific studies and have contributed to a number of policy developments. The VIDUS study documented an explosive

HIV outbreak in the Downtown Eastside in 1997, which led to the declaration of a public health emergency in Vancouver. In addition to the valuable data gained through VIDUS, the study also performs an important public health function by providing regular HIV and HCV testing (including pre- and post-test counselling) to local IDU. In 2005, VIDUS was modified to include only HIV-negative IDU and operates as a sister cohort to ACCESS, which includes only HIV-positive PWUD. Thus, VIDUS is designed to allow for the careful monitoring of the HIV epidemic among local IDU, including the factors that promote and reduce HIV infection.

ACCESS

ACCESS (AIDS Care Cohort to Evaluate access to Survival Services) is a cohort study of HIV-positive PWUD in the Greater Vancouver area, approximately half of whom are based in Vancouver's Downtown Eastside neighbourhood. The primary goal of the ACCESS cohort is to determine the health needs of HIV-positive PWUD and to investigate behaviours that may contribute to, or prevent, the ongoing transmission of HIV among this population. ACCESS is made up of more than 750 participants. Aside from generating data to inform the delivery of HIV treatment services, a central objective of the ACCESS cohort is to connect study participants with HIV care and other services when needed.

ARYS

Youth can be defined as "at risk" as a result of a variety of factors, including their socioeconomic situation, mental or physical health, drug use practices, social or physical environment, or family situation. The At-Risk Youth Study (ARYS, pronounced "Arise") was established in late 2005 to investigate factors associated with the initiation of injection drug use and the impacts of methamphetamine use among street-involved youth 14 to 26 years of age. The semi-annual follow-up of approximately 1,100 ARYS participants allows for longitudinal evaluation of the health and social situations of street-involved youth. This study is situated in the Downtown South area, where the majority of Vancouver's street-involved youth spend most of their time.

Key Indicators

A number of key indicators of the magnitude and severity of drug-related problems have been identified in research undertaken in Vancouver and in many settings internationally. This report seeks to describe these key indicators to provide policy makers and others with quality data on trends related to illicit drug use and related harms in Vancouver. The publication of these indicators will help to ensure that the City of Vancouver's Four Pillars Drug Strategy and the province's addiction strategies are guided by the best available evidence.[41, 42] Similarly, since federal laws and policies shape the nation's response to the illicit drug problem, the report also aims to inform the ongoing implementation of the federal government's National Anti-Drug Strategy.[43] It is also hoped that this report will be valuable to researchers, community-based organizations and policy makers in other settings. Key indicators in this report are described below.

Demographic Characteristics

To help identify individuals at heightened risk for drug-related harm, UHRI cohort studies collect detailed demographic information on study participants, including age, gender, sexual identity and ethnic background. UHRI researchers also seek to inform policy makers of the specific health needs of Aboriginal populations and attempt to make relevant data available to community members, community-based organizations and policy makers so that programs can be appropriately targeted.

Unstable Housing

Housing is recognized internationally as a key determinant of health. Unstable housing among drug-using populations has the potential to aggravate the public health and community harms associated with illicit drug use. Living on the street, in unstable housing situations such as shelters, and in certain single-room occupancy environments, has been shown previously to be strongly associated with a number of harms, including elevated risk of mortality.[44] Further, studies indicate a high prevalence of homelessness among street-involved youth, which is associated with an increased risk of HIV and HCV transmission.[45, 46] Housing is often lost as a result of instability related to illicit drug use, resulting in increased rates of individuals living on the streets.[47] Alternatively, the availability of supportive housing can be a key determinant in

transitioning individuals off the street and may reduce health harms associated with illicit drug use.[48]

The UHRI cohorts utilize a standardized questionnaire to track several measures of unstable housing. Outright homelessness and unstable housing (defined as living in a single room occupancy hotel, shelter, recovery or transition house, jail, on the street, or having no fixed address) are evaluated among all cohort participants at each study visit.

Addiction Treatment

One of the most effective responses to drug-related problems is the provision of drug treatment to addicted individuals. Research has shown that addiction treatment such as methadone maintenance therapy for opiate users can play a key role in reducing illicit drug dependence and HIV risk behaviours among certain individuals.[49] By reducing drug dependence, treatment may also reduce levels of drug-related public health risks (for example, sharing used syringes) and may also reduce drug-related crime.[50-53] Access to addiction treatment among populations of PWUD is a strong mediator of health outcomes. Research across a wide range of settings internationally has demonstrated that IDU with ready access to drug treatment subsequently engage in lower levels of drug use and high-risk drug use behaviours such as injecting with used syringes. Conversely, those subpopulations that report barriers to accessing addiction treatment are often at higher risk of a range of health harms.[49, 54]

All UHRI cohort interviewer-administered questionnaires solicit detailed data regarding access to different types of addiction treatment, including where and how such access takes place, and whether barriers exist that may reduce the ability of individuals to access such treatment. Accordingly, addiction treatment use and barriers to treatment access among cohort participants are measured at each study visit.

Syringe Sharing & HIV/HCV Incidence

The sharing of used syringes is the behaviour that places IDU at highest risk of acquiring or transmitting HIV and other blood-borne diseases such as HCV,[55, 56] because blood serum can be transferred easily from person to person via injecting equipment. Syringe sharing, therefore, is a reliable indicator of the risk of blood-

borne disease transmission that exists among populations of IDU. The presence of HIV and HCV infection among vulnerable populations can place a massive burden on health care systems, as providing treatment for these conditions may require a large redistribution of resources. Additionally, HIV and HCV infection may be more prevalent among certain subpopulations, such as different ethnic groups.[57, 58] The success of interventions that aim to reduce the harm posed by injection drug use, such as needle and syringe distribution programs and supervised injection facilities, can be evaluated directly by their capacity to reduce the sharing of used syringes among their target populations.

In all UHRI cohorts, the prevalence of syringe lending and borrowing is measured using a standardized interviewer-administered questionnaire. Because difficulty accessing sterile syringes has been identified as a key indicator of syringe sharing in Vancouver,[59, 60] all UHRI cohort questionnaires also solicit detailed data regarding barriers to sterile syringe acquisition. The cohorts also measure HIV and HCV incidence by testing cohort participants' HIV and HCV status at each semi-annual study visit

through serological testing (i.e., blood samples). Unless otherwise stated, data regarding syringe sharing refer to behaviour in the six months prior to the interview.

Incarceration

Given the current state of Canadian law regarding the distribution, possession and use of certain drugs, it is not surprising that the majority of PWUD in our studies report having been incarcerated at some point. Incarceration may pose significant public health risks for IDU. For example, the continued availability of illicit drugs and a lack of sterile syringes within correctional institutions can result in a high rate of syringe sharing and infectious disease transmission among incarcerated IDU.[61, 62] Additionally, in jurisdictions that do not provide methadone or other drug treatment in correctional institutions, the incarceration of IDU may result in a disruption of methadone treatment.[63] As well, HIV-positive IDU who are incarcerated are often at risk of experiencing a disruption in the use of antiretroviral medication, which results in disease progression as well as preventable illness and health care costs.[64]

All UHRI cohort interviewer-administered questionnaires collect detailed data at study enrolment (baseline) and at each study follow-up concerning the experiences of study participants while incarcerated. Questions include type and prevalence of drug use, prevalence of injection- and sex-related health risks, and access to drug treatment such as methadone during incarceration.

Cocaine Injection

Because of the short half-life of cocaine, heavily dependent cocaine injectors may inject up to 20 times a day, as opposed to heavily dependent heroin injectors who, because of heroin's longer half-life, may inject only 2 to 4 times a day.[65] Consequently, cocaine injection has been associated with high levels of used syringe sharing as a result of the large volume of syringes needed daily and the psychoactive effects of cocaine.[66, 67] Additionally, because of the high number of syringes that heavily dependent cocaine injectors require, this behaviour can result in a high level of publicly discarded syringes and subsequently may negatively affect the local economy, deter tourist traffic, increase the potential for public health harms, and increase public disorder.[68] These harms are exacerbated

by the lack of effective treatment options for heavily dependent cocaine users.

UHRI's cohort studies collect data on several measures related to cocaine injection among participants at study enrolment and during study follow-up through interviewer-administered questionnaires. These data can be used to determine the prevalence of injection cocaine use, factors associated with the initiation of cocaine use, geographic location of injection, and frequency of cocaine injection. Unless otherwise indicated, data in this report regarding injection cocaine use refer to use of this drug in the six months prior to the interview.

Heroin Injection

Despite efforts to reduce supply, heroin continues to be readily available in Vancouver at low cost and at a high level of purity.[69] We have previously observed associations between frequent heroin use and a host of risk behaviours among Vancouver IDU.[70] As well, adverse health outcomes from heroin injection, including fatal and non-fatal overdoses, have been documented in the literature.[71, 72] Incidental data suggest that the prevalence of injection heroin use may be decreasing among Vancouver IDU while the prevalence of crystal methamphetamine and crack cocaine use may be rising among this population, yet the proportion of IDU who continue to inject heroin remains high.[73] While a network of interventions aimed at reducing the harm of injection drug use exists in Vancouver's Downtown Eastside, heroin injection continues to negatively affect public health and public order.

UHRI's cohort studies collect data on several measures related to heroin injection. These data, collected through interviewer-administered questionnaires, cover many factors related to the circumstances surrounding heroin injection, the sociodemographic variables that may make individuals more likely to inject heroin, and specific injecting practices that may increase health risks. Unless otherwise indicated, data in this report regarding injection heroin use refer to use of this drug in the six months prior to the interview.

Crystal Methamphetamine Use

Rates of crystal methamphetamine use appear to have risen among many injection and non-injection drug-using populations.[40, 73] One study that investigated

crystal methamphetamine use among VIDUS participants confirmed that between May 1996 and December 2004, the proportion of participants reporting crystal methamphetamine injection increased significantly.[10] Recent evidence also suggests that crystal methamphetamine use is elevated among street-involved youth and is linked to a wide array of negative health consequences, such as non-fatal overdoses and HCV transmission.[74-76]

All UHRI cohorts also solicit detailed data regarding crystal methamphetamine use to fully investigate the potential public health and public order harms of this drug across various life stages. Detailed data regarding the impact of crystal methamphetamine on overdose events, polydrug use behaviours, and other potential health harms are collected through interviewer-administered questionnaires. Unless otherwise indicated, data regarding crystal methamphetamine use refer to use of this drug in the six months prior to the interview.

Prescription Opioid Injection

Prescription opioid misuse has been shown to be increasingly common among PWUD, including street-involved youth.[77, 78] High accessibility to these drugs through medical systems and increasing availability within illicit drug markets has changed drug use trends in this setting.[79-81] Of concern, a study conducted among young IDU revealed that experimenting with prescription opioids may be a key feature in their initiation into the use of hard drugs.[77]

UHRI's cohort studies collect data on several measures related to prescription opioid injection. These data can be used to determine the prevalence of prescription opioid injection, factors associated with prescription opioid injection and intensity of prescription opioid injection among our study participants. Unless otherwise indicated, data in this report regarding injection of prescription opioids refer to use of these drugs in the six months prior to the interview.

Sex Work

Sex workers who exchange sex for money, drugs, shelter or other commodities as a means of daily survival are highly vulnerable to adverse health outcomes, including violence, exploitation and sexually transmitted infections.[82, 83] These risks are further compounded by

the use of injection and non-injection drugs.[84] One primary goal of the UHRI cohort studies is to investigate sex work among PWUD in Vancouver, to help inform interventions or policies that may reduce the vulnerability of such individuals as well as the negative effects on communities.

Using serologic testing and interviewer-administered questionnaires, UHRI cohort studies are able to collect data regarding blood-borne disease transmission, drug use practices, and many other indicators of health specific to sex work among PWUD. Sex work is evaluated at each semi-annual follow-up visit.

Violence

In many settings, violence has consistently been linked to exposure to street-based drug scenes. One study

documented a strong relationship between exposure to street-based drug scenes and violence among IDU in Vancouver.[4] Among high-risk populations, violence has been associated with a wide array of health-related harms and HIV-related risk behaviours, including accidental overdose and sharing of needles.[85]

All UHRI cohort interviewer-administered questionnaires solicit detailed data on experiences of violence, including frequency of being attacked, the type of attack and who the attacker was. Unless otherwise indicated, data in this report regarding violence refer to experiences of violence in the six months prior to the interview.

Drug Use Cessation

Numerous studies in various North American settings have investigated cessation of drug use. These studies have found that various factors, including the use of methadone maintenance therapy and other addiction treatment programs, were positively associated with drug use cessation. Moreover, structural and environmental factors, such as stable housing and employment, were also strongly linked to drug use cessation.[86-88]

Using interviewer-administered questionnaires, UHRI cohort studies are able to collect data on injection drug use cessation over six-month intervals. Cessation is defined in our studies as a period of six months without any episodes of drug injecting. Unless otherwise stated, data regarding injection drug use cessation refer to behaviours in the six months prior to the interview.

Mortality

Prior research in a variety of settings has consistently observed high mortality rates among PWUD. Many health harms, such as elevated HIV incidence and a high rate of fatal overdose, can contribute to this increased mortality rate.[1, 89] Potentially fatal consequences of illicit drug use, such as overdose events, also often require emergency interventions (e.g., ambulance response and emergency care) that may place a significant strain on health care systems and give rise to high economic costs.[90]

To investigate the mortality rate and causes of death among our study populations, a variety of data sources were used. In particular, data from the British Columbia Vital Statistics Agency were used to track mortality rates.

Findings

Cohort Demographics

VIDUS, the longest running of UHRI's prospective cohort studies, began recruitment in 1996. By the end of 2011, 1,979 unique individuals had enrolled in VIDUS, all of whom were current or former IDU. VIDUS includes 640 (32%) female participants, 1,323 (67%) male participants, and 16 (1%) transgender participants; 1,241 (63%) participants self-identify as Caucasian and 512 (26%) self-identify as Aboriginal. At study enrolment, the mean age of VIDUS participants was 34 (interquartile range [IQR] = 27–41) and the total age range for all VIDUS participants was 14 to 53. Since 1996, 175 VIDUS participants have become HIV-positive and have been moved into the ACCESS cohort of HIV-positive PWUD, and a total of 539 VIDUS participants have died. Therefore, approximately 1,000 individuals are currently under active follow-up in the VIDUS cohort. Throughout this report, we refer to VIDUS participants as "HIV-negative IDU."

The **ACCESS** cohort is made up of HIV-positive PWUD. By the end of 2011, 763 participants were enrolled in the study. Compared to the VIDUS cohort, ACCESS has a lower percentage of Caucasian participants (423, 55%) and a higher percentage of participants who self-identify as Aboriginal (301, 39%). At baseline, the mean age of ACCESS participants was 39 (IQR = 34–44), and the total range for all ACCESS participants was 16 to 65. Throughout this report, we refer to ACCESS participants as "HIV-positive PWUD."

ARYS, UHRI's at-risk youth cohort study, began recruitment in 2005. By the end of 2011, 1,111 unique individuals were enrolled in ARYS; 751 (68%) study participants self-identify as Caucasian and 262 (24%) self-identify as Aboriginal. At study enrolment, the mean age of ARYS participants was 20 (IQR = 18–22), while the total age range for all ARYS participants was 14 to 28. Throughout this report, we refer to ARYS participants as "street-involved youth."

The total enrolment in all UHRI cohorts is 3,853 and includes 1,244 (32%) women and 33 (1%) transgender individuals. Overall, 2,415 participants self-identify as Caucasian (63%) and 1,075 (28%) participants self-identify as Aboriginal. At baseline, the mean age of UHRI cohort study participants was 31 (IQR = 22–39), and the age range was 14 to 65. These findings can be seen in Figures 1 and 2.

Figure 1: Gender distribution across all UHRI cohorts

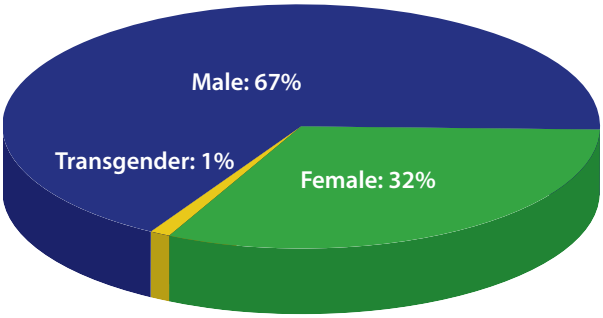
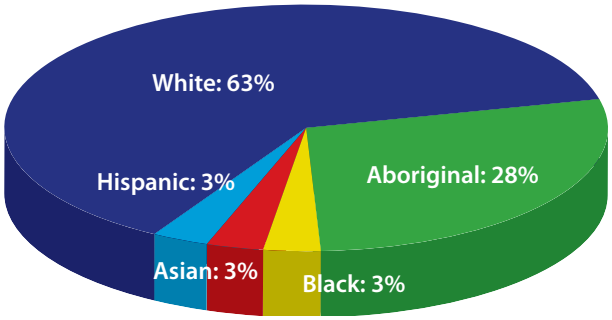


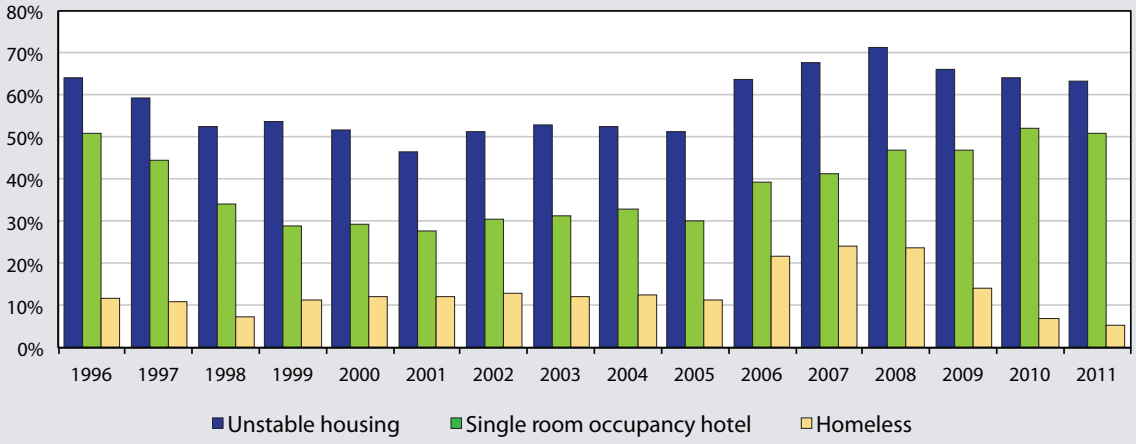
Figure 2: Distribution of ethnicity and Aboriginal ancestry across all UHRI cohorts



Housing

Trends in unstable housing among Vancouver PWUD between 1996 and 2011 are presented in Figure 3. Unstable housing is defined as living in a shelter or hostel, treatment or recovery house, jail, single room occupancy hotel, on the street, or having no fixed address. As shown here, the prevalence of outright homelessness (living on the street or having no fixed address) remained at approximately 10% between 1996 and 2005. In 2007, the prevalence of homelessness reached a high of 24.3% but then gradually declined to a low of 5.4% in

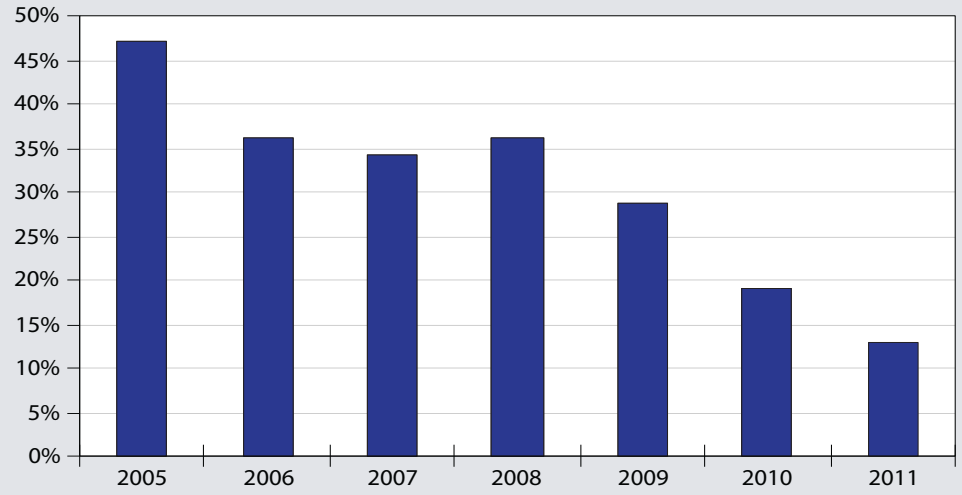
Figure 3: Patterns of unstable housing, single room occupancy hotel use and homelessness among people who use illicit drugs in Vancouver, 1996–2011



Note: 'Unstable housing' includes living in a shelter or hostel, treatment or recovery house, jail, single room occupancy hotel, on the street, or having no fixed address.

2011. Although the data suggest a rise in unstable housing primarily as a result of increases in the number of people living in single room occupancy hotels, these data should be interpreted with caution. In recent years, an increasing number of single room occupancy hotels have been converted into supportive housing environments which may not be best described as unstable housing, given the level of support provided to people living there. (Note: The percentages add up to greater than 100% because of overlap between the above definitions).

Figure 4: Percentage of street-involved youth reporting homelessness in Vancouver, 2005–2011



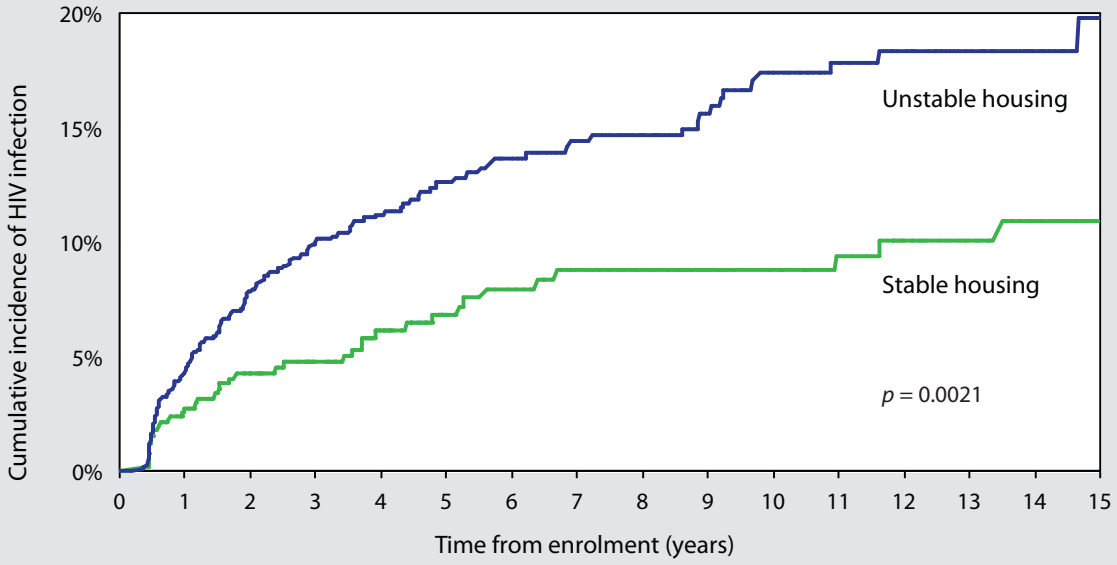
Note: 'Homelessness' is defined as living on the street or having no fixed address.

As presented in Figure 4, the percentage of street-involved youth reporting homelessness has been steadily declining over the years, from 47.2% in 2005 to 12.9% in 2011. However, these data may be limited by the fact that, because homeless individuals do not have fixed addresses, they are harder to contact and consequently are often lost to follow-up from the study. As a result, the declines in homelessness among street-involved youth may reflect the fact that individuals who remain in the study are less likely to be homeless for long periods of time.

Figure 5 shows the relationship between unstable housing and HIV inci-

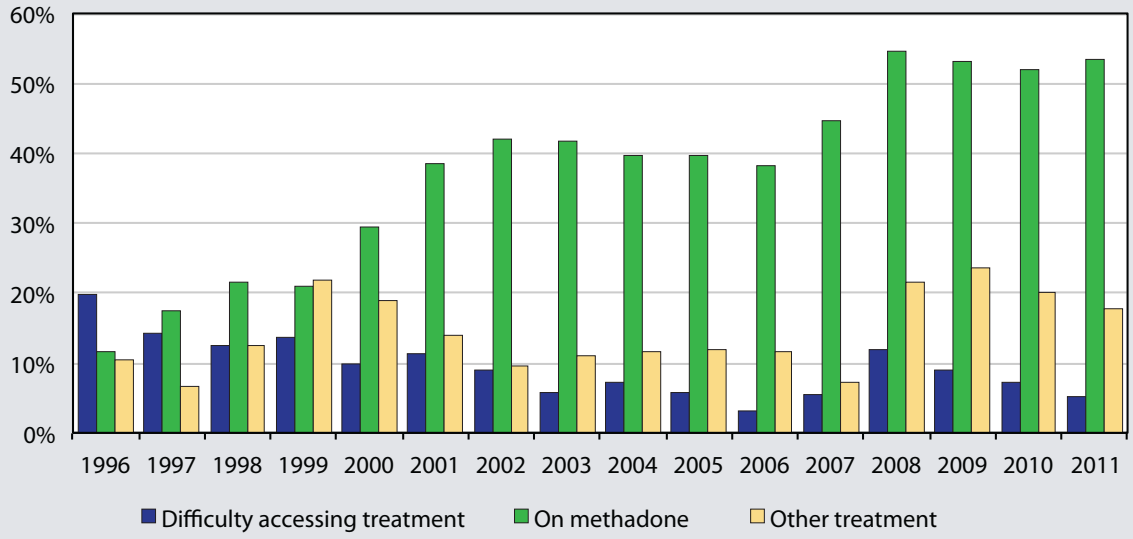
dence (i.e., the number of people newly infected) among IDU in Vancouver. As shown here, after 15 years of recruitment into VIDUS, the cumulative HIV incidence rate was 11.6% among those IDU living in stable housing (i.e., living in an apartment or house) at baseline, in comparison to a cumulative HIV incidence rate of 22% among those without stable housing at baseline.

Figure 5: Cumulative incidence of HIV infection among people who inject drugs in Vancouver, 1996–2011, stratified by housing status



Note: 'Unstable housing' includes living in a shelter or hostel, treatment or recovery house, jail, single room occupancy hotel, on the street, or having no fixed address. 'Stable housing' is defined as living in an apartment or house.

Figure 6: Patterns of access to addiction treatment among people who use illicit drugs in Vancouver, 1996–2011



Note: 'Other treatment' includes detox, daytox, recovery house, treatment centre, NA / CA / AA, and counselling.

Addiction Treatment

Figure 6 presents patterns of access to addiction treatment among PWUD in Vancouver over a 15-year period. As shown, the proportion of PWUD reporting access to methadone maintenance therapy (MMT) increased from 11.7% in 1996 to 54.5% in 2008. Since then, the percentage of those accessing MMT has been relatively stable. No clear trend emerges over the study period for treatments other than MMT. The positive trend in access to MMT has also been accompanied by a decrease in the proportion of PWUD reporting difficulty

accessing treatment, from 19.9% in 1996 to approximately 3.2% in 2006. Although there was a slight increase in the proportion of individuals reporting difficulty accessing treatment in 2007 and 2008, with a high of 11.9% in 2008, this number has been declining since then. While these data are generally encouraging, it should be noted that an individual who has experienced difficulty obtaining treatment in the past may be deterred from seeking treatment in the future. As well, strong trends have emerged showing that Aboriginal PWUD have reduced access to addiction treatment such as MMT.

HIV Risk Behaviour

Figure 7 demonstrates trends in injection-related HIV risk behaviour among

Figure 7: Patterns of injection-related HIV risk behaviour among people who use illicit drugs in Vancouver, 1996–2011

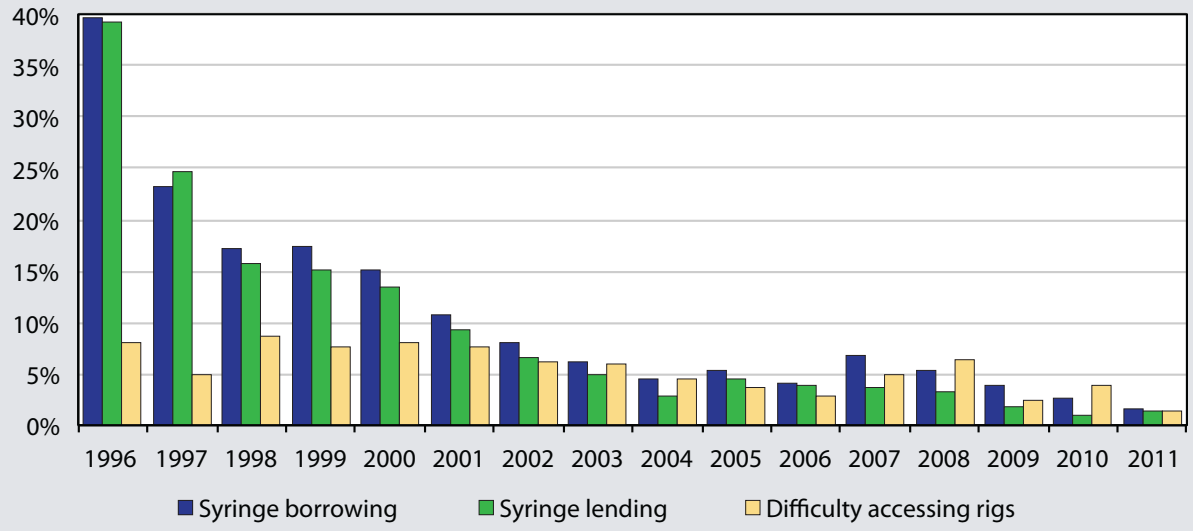
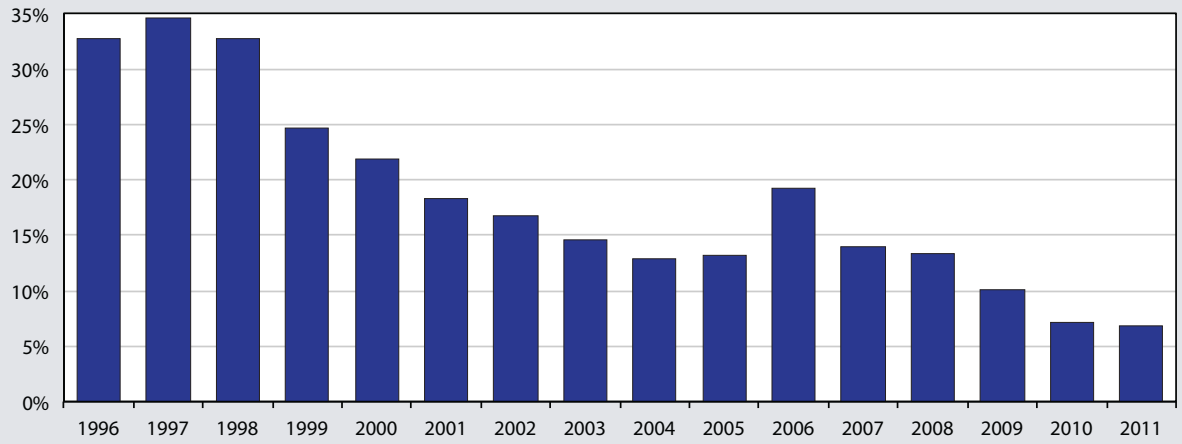


Figure 8: Percentage of people who use illicit drugs in Vancouver reporting recent incarceration, 1996–2011



Note: 'Incarceration' is defined as being in detention, prison, or jail overnight or longer.

PWUD in Vancouver over the last 15 years. Specifically, the graph displays a steady decline in the level of used syringe sharing reported by PWUD throughout the study period. At baseline (study enrolment), 39.6% of PWUD reported syringe borrowing in the prior six months, but this number had dropped to 1.7% by the close of the study period. Similarly, at baseline, 39.2% of PWUD reported lending syringes, and by the close of the study period this number had dropped to 1.3%. With respect to sterile syringe availability, levels of difficulty accessing sterile syringes reported by PWUD declined from 8% in 1996 to 1.5% in 2011, though this trend fluctuated throughout the study period.

Law Enforcement & Incarceration

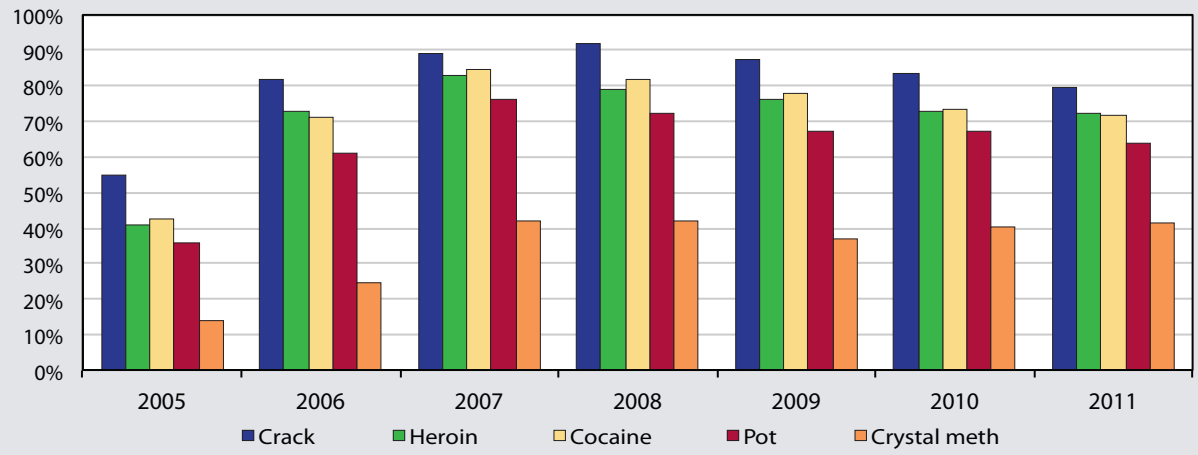
The percentage of PWUD in Vancouver reporting being recently incarcerated (i.e., held in detention, prison or jail over-

night or longer in the last six months) between 1996 and 2011 is shown in Figure 8. Overall, the proportion of PWUD reporting recent incarceration dropped from a high of 34.6% in 1997 to a low of 6.8% in 2011. A limitation of these data is that when individuals are incarcerated they are often lost to follow-up from the study. As a result, the declines in the proportion of individuals incarcerated may reflect a cohort effect whereby individuals who commit crimes are removed from the study and those who remain in the study are less likely to engage in behaviours (e.g., drug dealing) that may place them at risk of incarceration. Aging of the cohort may also play a role.

Illicit & Prescription Opioid Availability

Figure 9 presents the availability of illicit drugs reported by PWUD between 2005

Figure 9: Availability of illicit drugs among people who use illicit drugs in Vancouver, 2005–2011

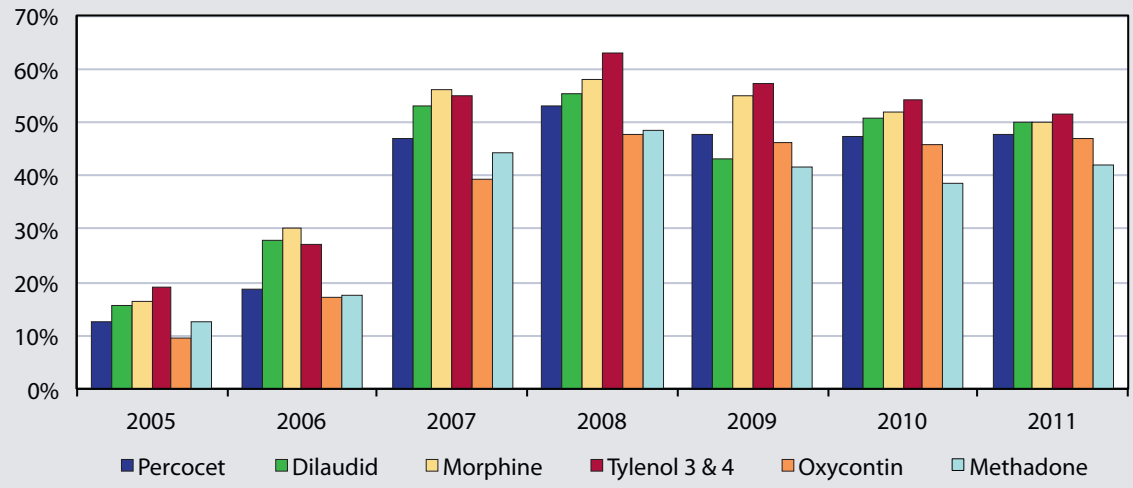


Note: Percentages refer to availability within 10 minutes.

and 2011. As this figure shows, a large majority of respondents reported rapid access to crack cocaine, with approximately 85% of PWUD reporting that they can obtain crack within ten minutes. Additionally, PWUD reported relatively rapid access to both heroin and cocaine, with approximately 80% reporting that they could obtain these drugs within ten minutes. Lastly, slightly increased access to crystal methamphetamine by PWUD was reported.

The availability of prescription opioids reported by PWUD over the past six years is shown in Figure 10. As indicated here, all prescription opioids listed were increasingly accessible until 2008; in 2009 and 2010, immediate drug avail-

Figure 10: Availability of prescription opioids among people who use illicit drugs in Vancouver, 2005–2011

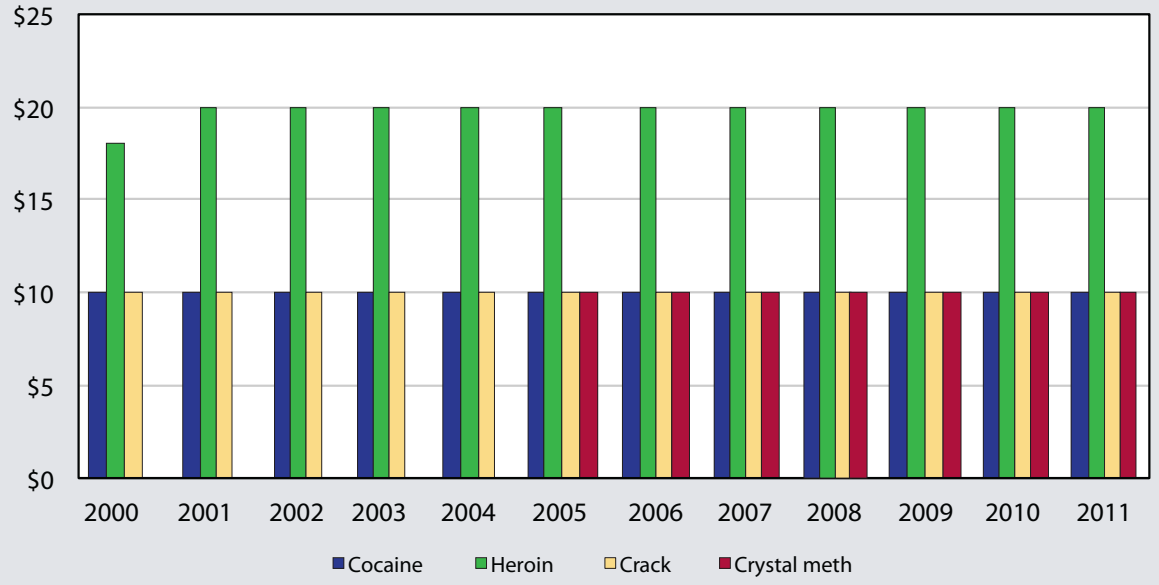


Note: Percentages refer to availability within 10 minutes.

ability dropped slightly. The prescription opioids that were easiest to obtain were Tylenol 3 & 4, morphine and Dilaudid. In 2011, 51.4% of PWUD reported access to Tylenol 3 & 4 within ten minutes, 50% reported access to morphine within ten minutes, and 49.9% reported access to Dilaudid within ten minutes.

Figure 11 presents longitudinal data on reported street prices of illicit drugs in Vancouver from 2000 to 2011. These data suggest that illicit drug prices have remained extremely stable and low. As indicated here, the median reported street price of 0.1 gram of cocaine or crack cocaine was consistently $10 from

Figure 11: Median drug prices reported by people who use illicit drugs in Vancouver, 2005–2011



Note: Adjusted unit cost per 0.1 gram. Data on crystal methamphetamine unavailable before 2005.

2000 to 2011, while the median reported street price of 0.1 gram of heroin was consistently $20 from 2001 to 2011. The median reported street price of 0.1 gram of crystal methamphetamine remained at $10 from 2005 to 2011. Again, the stability of the street price of these drugs appears to contradict assertions that interdiction efforts have meaningfully interrupted drug supply and driven up the price of drugs.

Drug Use Patterns

Drug use patterns among Vancouver PWUD were observed over a 15-year period and these results are shown in Figures 12 through 16. In the figures, "cocaine" and "heroin" refer to injection cocaine and injection heroin use, while "crack" refers to crack cocaine smoking. As can be seen, while the prevalence of overall drug use remained relatively constant, large fluctuations in the use of

Figure 12: Percentage of people who use illicit drugs in Vancouver reporting daily cocaine injection, 1996–2011

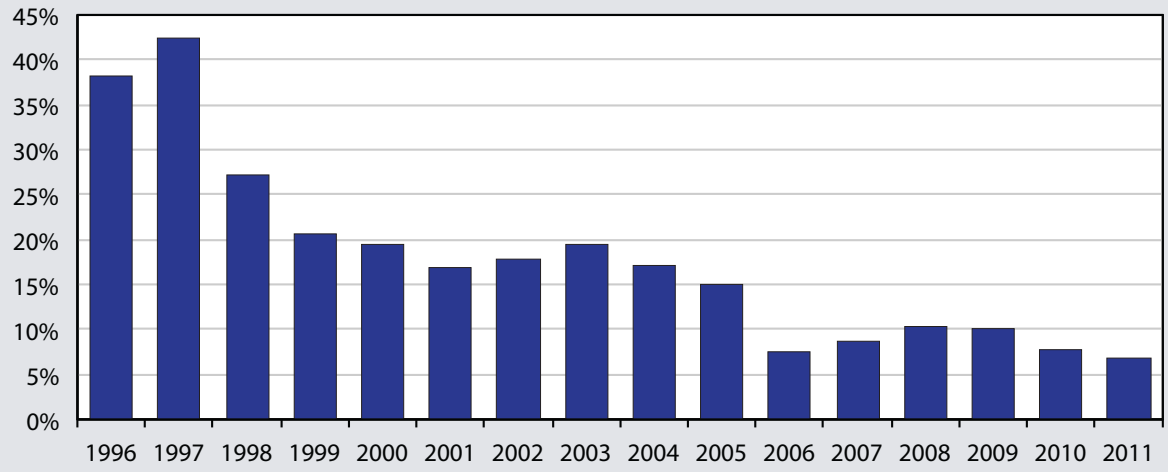
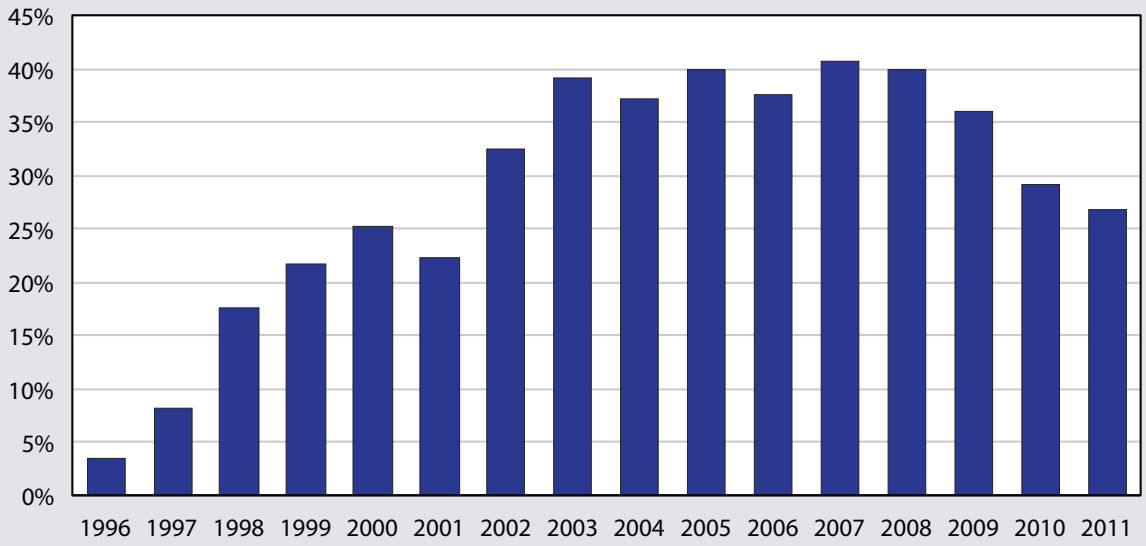


Figure 13: Percentage of people who use illicit drugs in Vancouver reporting daily crack smoking, 1996–2011



specific drugs occurred over the study period. For instance, the proportion of participants reporting having injected cocaine daily in the last six months decreased from a high in 1997 of 42.5% to 6.9% in 2011 (Figure 12). This decrease was accompanied by a large increase in crack cocaine use among this cohort, as shown in Figure 13, with 3.5% of participants reporting smoking crack cocaine on a daily basis in the last six months in 1996, compared with a high of 40.7% reporting such behaviour in 2008. However, the prevalence of daily crack cocaine use declined to 26.9% in 2011. While injection heroin use fluctuated,

Figure 14: Percentage of people who use illicit drugs in Vancouver reporting daily heroin injection, 1996–2011

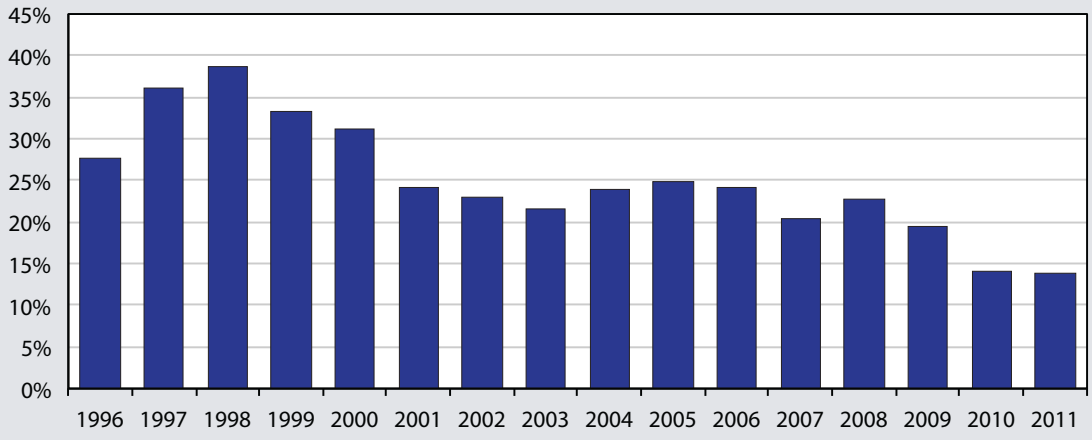
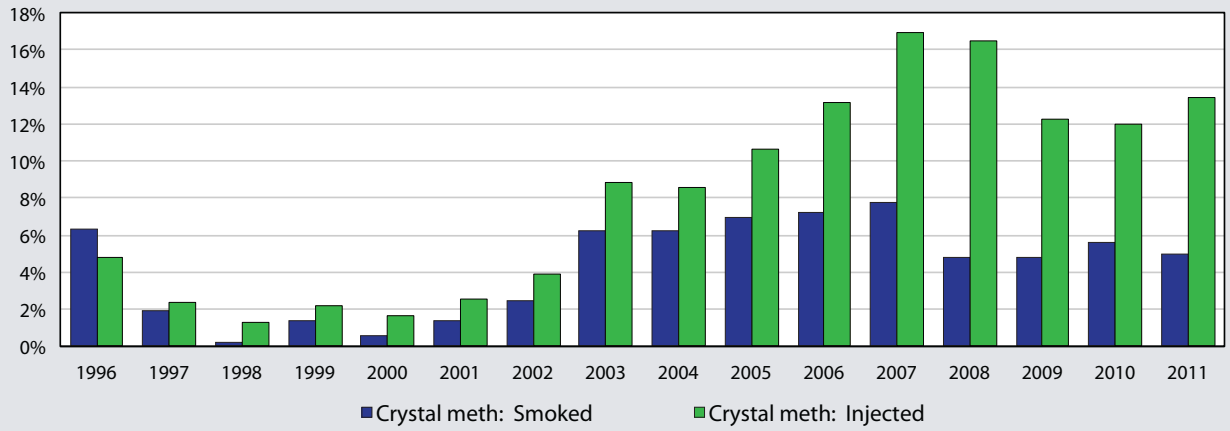


Figure 15: Percentage of people who use illicit drugs in Vancouver reporting crystal methamphetamine use, 1996–2011



as Figure 14 shows, these changes were less pronounced, with 27.7% of participants reporting having injected heroin daily in the last six months in 1996, compared with 14% of participants reporting such behaviour in 2011. As Figure 15 shows, while the prevalence of crystal methamphetamine use is much lower when compared with the use of other drugs among this cohort, there is an identifiable increase in the prevalence of smoked and injected crystal methamphetamine use between 2001 and 2007. However, between 2008 and 2011, the prevalence of non-injection crystal methamphetamine use has been consistently around 5%. Conversely, the prevalence of crystal methamphetamine injection remains high, at approximately 13% in 2011. Figure 16 presents the

Figure 16: Percentage of people who use illicit drugs in Vancouver reporting prescription opioid injection, 1996–2011

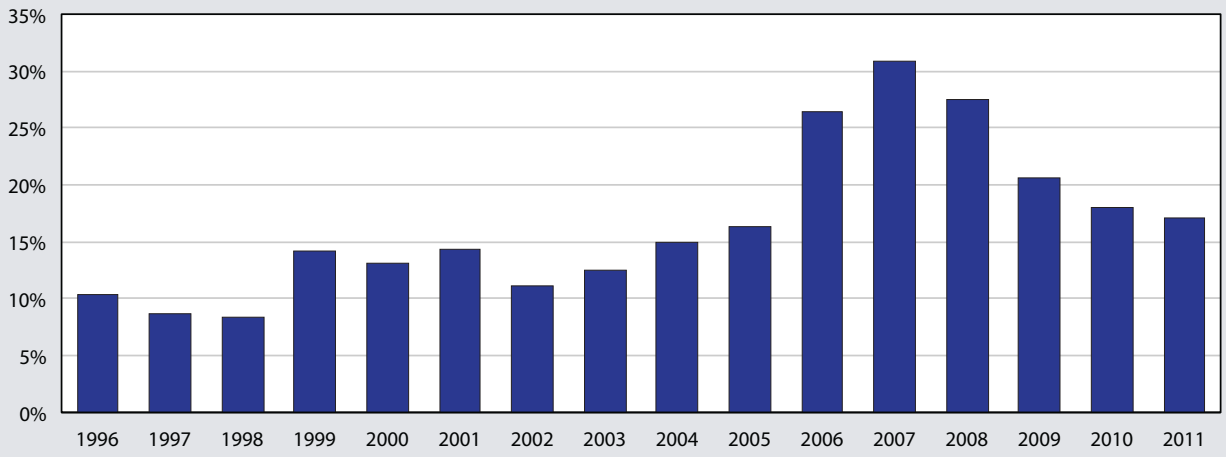
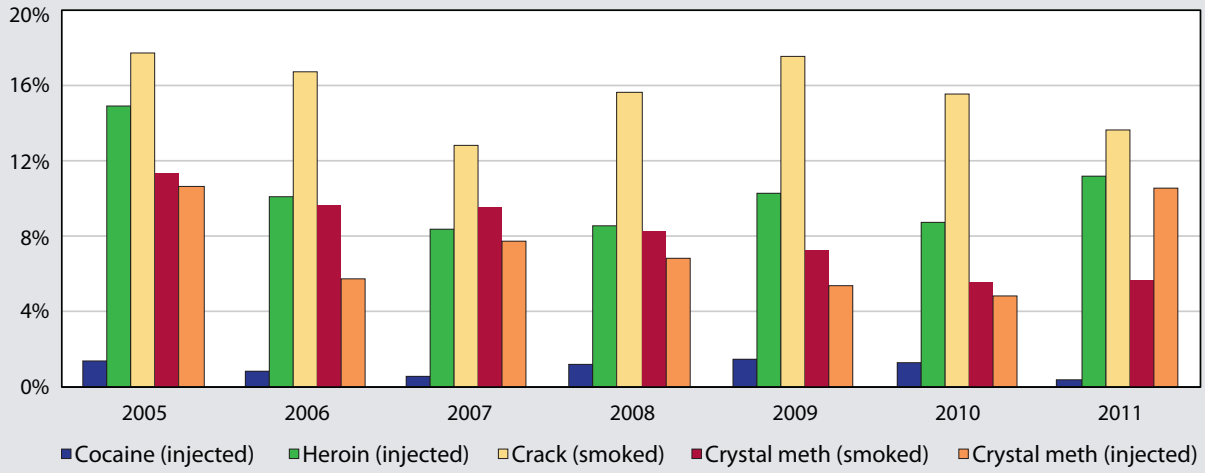


Figure 17: Percentage of Vancouver street-involved youth reporting daily use of cocaine, heroin, crack or crystal methamphetamine, 2005–2011



prevalence of prescription opioid injection among PWUD. Shown here, the prevalence of prescription opioid injection steadily increased from 2002 to 2007, with a high of 30.9% in 2007, then declined to 17.1% in 2011.

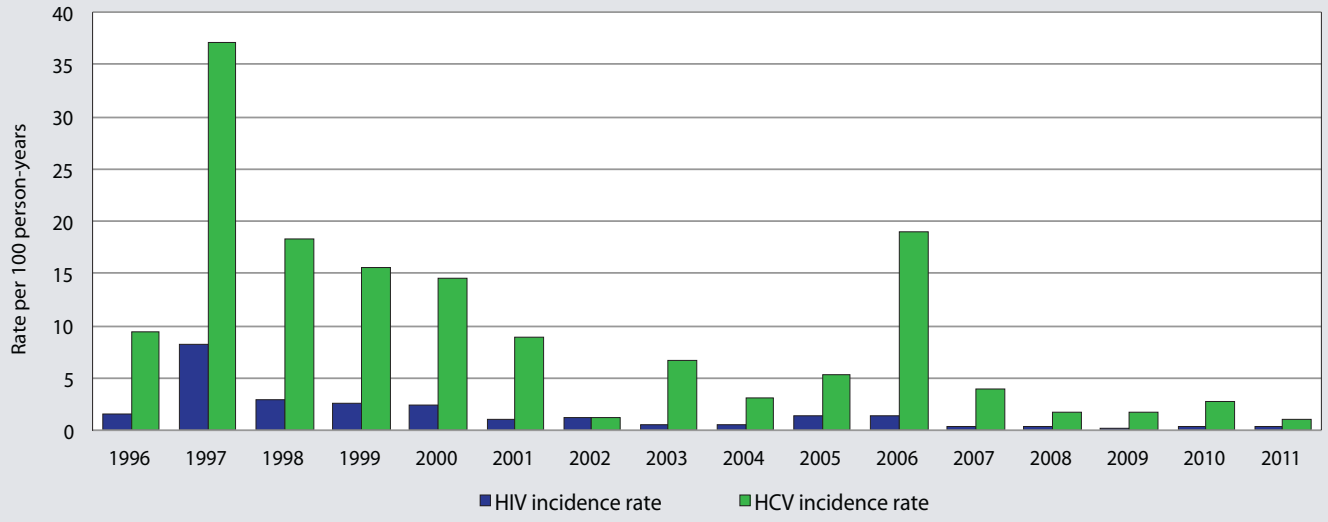
The drug use patterns among street-involved youth for the years 2005 to 2011 are presented in Figure 17. Crystal methamphetamine is much more popular among street-involved youth in Vancouver than it is among adult PWUD, while injection cocaine and injection heroin use appear to be much less common. Crack cocaine use was, however, highly prevalent among street-involved

youth and fluctuated over the years, with a high of 17.5% in 2009. Since then, the prevalence of daily crack cocaine use has declined to 13.7% in 2011.

HIV & Hepatitis C Incidence

As can be seen in Figure 18, there appears to be a decreasing trend in HIV and hepatitis C (HCV) incidence among PWUD in Vancouver. While HCV incidence reached a high of 37.1 cases per 100 person-years in 1997, by the end of the study period the incidence rate had declined to 1.1 cases per 100 person-years. A similar decrease was observed with respect to HIV incidence, which dropped from a high of 8.1 per 100 person-years in 1997 to 0.37 cases per 100 person-years in 2011.

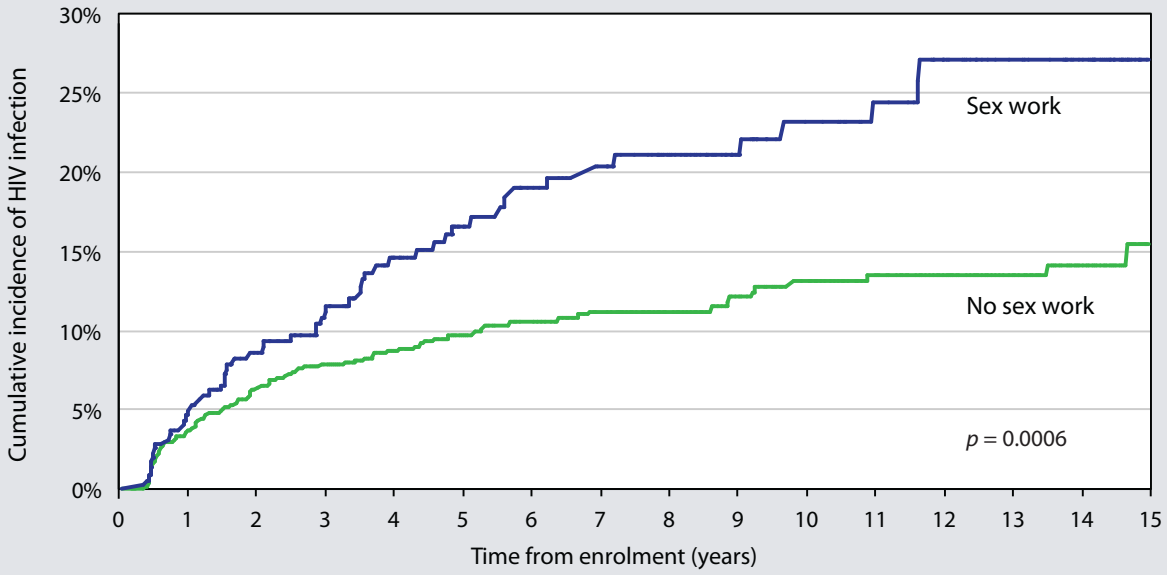
Figure 18: Incidence of HIV and HCV infection among people who use illicit drugs in Vancouver, 1996–2011



Sex Work

Among street-involved youth in Vancouver, 11.7% reported sex work in 2011. Additionally, 19.3% of HIV-positive PWUD and 20% of HIV-negative IDU in Vancouver reported sex work. Figure 19 presents data regarding the association between sex work and the cumulative incidence of HIV among IDU in Vancouver, measured over a 15-year period (1996–2011). As this figure shows, the cumulative HIV incidence rate was 27.1% among sex workers who inject illicit drugs versus 15.4% among non-sex-working IDU.

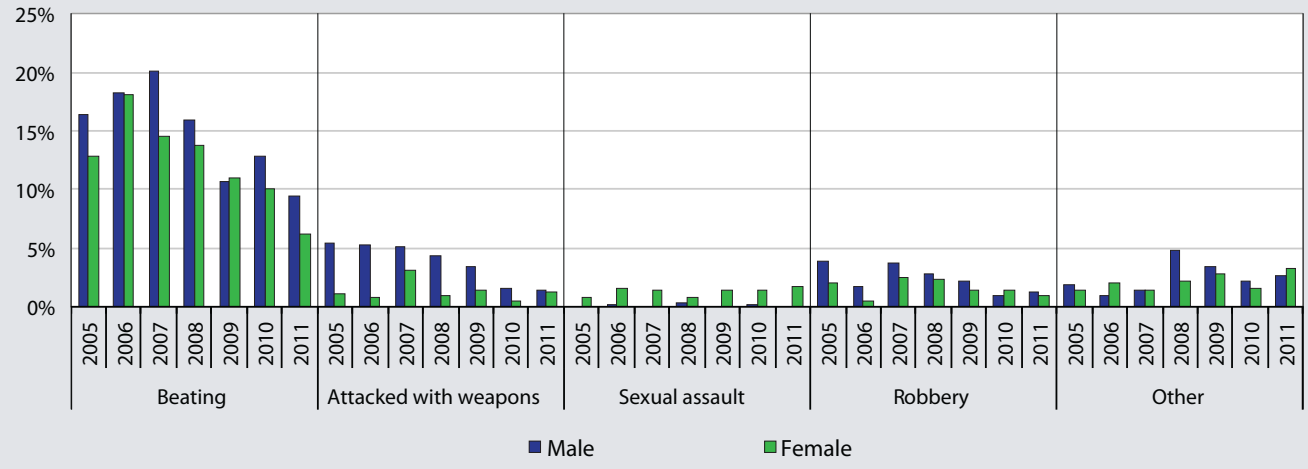
Figure 19: Cumulative incidence of HIV infection among people who inject drugs in Vancouver, 1996–2011, stratified by engagement in sex work



Violence

Figure 20 shows data on violence among male and female PWUD between 2005 and 2011. Overall, there is a decreasing trend in reports of violence among PWUD, although the prevalence of sexual assault reported by women has been slightly rising in the past few years. The most commonly reported type of attack for both male and female PWUD was a beating, with 9.5% of male PWUD and 6.3% of females reporting a beating in 2011. Differences between types of attacks were observed, with a higher prevalence of male PWUD reporting being attacked with a weapon or gun and being robbed compared to female PWUD. On the other hand, sexual assault was experienced more frequently by female PWUD.

Figure 20: Percentage of people who use illicit drugs in Vancouver reporting violence, 2005–2011, stratified by gender and type of attack



Drug Use Cessation

Patterns of injection drug use cessation between 1996 and 2011 are shown in Figure 21. As indicated here, there appears to be an upward trend of cessation between 1996 (0.4%) and 2005 (46.2%). However, in 2006, the prevalence drops dramatically to 22.5%. In subsequent years, there is an identifiable increase in injection drug use cessation reported among PWUD, with cessation reported at 46.6% in 2011. This trend reflects in part the administrative decision made in 2005 to replenish the cohort by recruiting more PWUD who fulfilled the eligibility criterion of having injected drugs in the previous six months.

Figure 21: Percentage of people who use illicit drugs in Vancouver reporting injection drug use cessation for a period of at least six months, 1996–2011

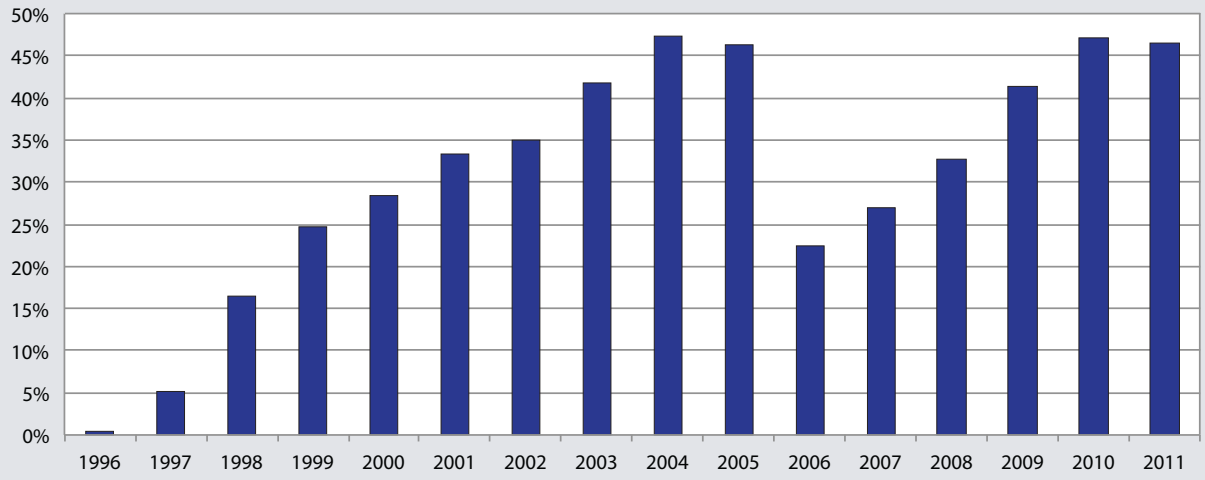
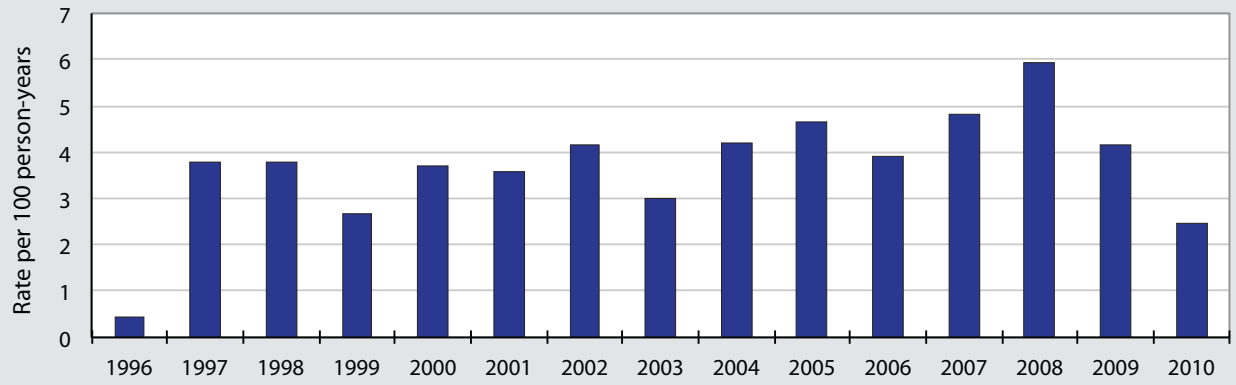


Figure 22: Mortality rate among people who use illicit drugs in Vancouver, 1996–2010



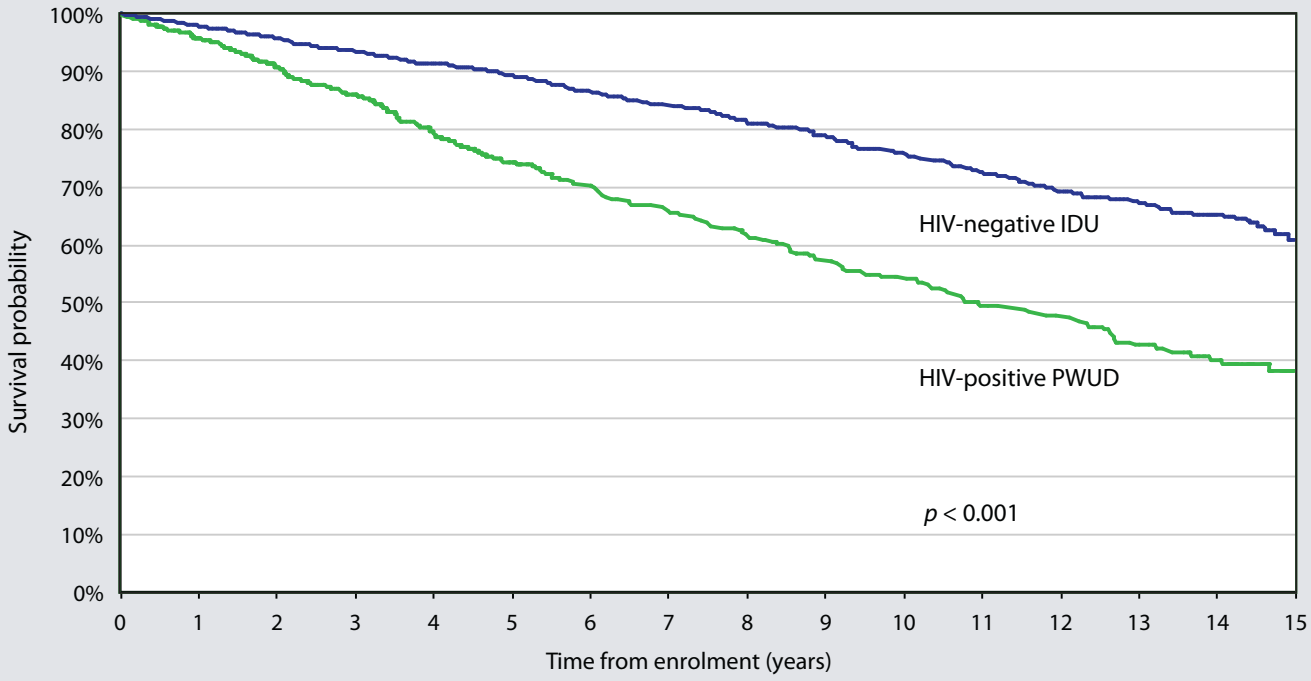
Mortality

Figure 22 presents data regarding the mortality rate among a cohort of PWUD in Vancouver between 1996 and 2010. While fluctuations in the mortality rate can be seen, there is no clear or identifiable trend in the data throughout the study period. However, between 2008 and 2010, a steep decline in the mortality rate can be observed.

The cumulative probability of mortality among PWUD in Vancouver over a 15-year period, stratified by HIV-status, is shown in Figure 23. As can be seen, baseline HIV-positive PWUD were significantly more likely to die during the study period than were IDU who were HIV-negative at baseline. Specifically, among 1,876 baseline HIV-negative individuals, 300 (16%) died during 15 years of follow-up. Among 827 baseline HIV-positive individuals, 205 (24.8%) died during 15 years of follow-up.

When indirect standardization was used to compare the death rate of male PWUD to the general male population of British Columbia aged 20 to 64, the crude rate of death was 7.91 (95% confidence interval: 4.9–11.2) times higher. Similarly, the death rate among female PWUD was 7.97 (95% CI: 4.2–12.1) times higher than the general female population of British Columbia aged 20 to 64.

Figure 23: Probability of survival among people who use illicit drugs in Vancouver, 1996–2011, stratified by HIV status



Discussion

This report gives a comprehensive overview of the illicit drug problem in the city of Vancouver over a 15-year period. It is useful to consider these findings in the context of the city's Four Pillars Drug Strategy and the federal government's National Anti-Drug Strategy.

Over the last 15 years, our findings revealed no significant improvements in the overall prevalence of unstable housing among people who use illicit drugs (PWUD) in Vancouver, with prevalence continuing to be between 50% and 70%. Furthermore, there has been an increasing proportion of individuals who report living in single room occupancy hotels (SROs), which is a form of low-income housing in the downtown core. Given the limited accommodation space provided in an SRO, individuals are forced to socialize in public spaces, thereby increasing their exposure to the street-based drug scene in the Downtown Eastside of Vancouver and consequently increasing their risk of health-related harms.[4] With more people congregating outdoors, in parks and on street corners, increased efforts must be made to address public order and public drug use in the city. More specifically, considerable investments in building and maintaining low-income housing are required.

Encouragingly, there have been significant increases in the proportion of PWUD in Vancouver who access methadone maintenance therapy (MMT), with over half reporting being on MMT between 2008 and 2011. The change in the uptake of MMT and the simultaneous reduction of PWUD reporting difficulty accessing treatment programs likely reflects the investment in drug and alcohol treatment services made by the Vancouver Coastal Health Authority. However, there continue to be factors that contribute to the unlikeliness that PWUD will access MMT, including employment barriers and incarceration.[91, 92] Given the benefits of MMT in linking people who use injection drugs (IDU) to HIV treatment and care,[93] efforts to address the barriers to accessing MMT and to explore low-threshold models of MMT delivery are of importance in this setting.

Patterns of injection-related HIV risk behaviour show a dramatic decline over the past 15 years. This is likely attributable to the expansion of harm reduction programs in Vancouver and in particular the increasing availability

of drug injecting paraphernalia through needle syringe programs and the local supervised injection facility.[9] As well, given growing evidence showing that HIV treatment is an extremely effective form of HIV prevention, the expansion of HIV treatment to HIV-positive PWUD in Vancouver has also likely contributed to the declines in HIV infection that have been observed.[94, 95] As our data show, this trend also coincides with a reduction in PWUD reporting difficulty accessing syringes and a decrease in HIV and HCV incidence among this population. However, despite a growing body of literature to support harm reduction interventions as a key approach to controlling the HIV epidemic,[96–98] and United Nations and World Health Organization consensus statements affirming the effectiveness of harm reduction programs, the federal government removed these programs from the National Anti-Drug Strategy. Without health policy changes that support the provision of harm reduction programs across the country, PWUD will continue to be at high risk for preventable health- and drug-related harms.

Over the past decade and a half, a substantial drug law enforcement presence has been observed in Vancouver, particularly in the Downtown Eastside neighbourhood. Consistent with this trend, a report by the Correctional Service of Canada documented an 18% rise in the number of offenders who had been sentenced on a drug-related offence between 1998 and 2008.[99] Of concern is the long-standing recognition that the incarceration of IDU increases their risk of HIV and HCV transmission, especially in settings where sterile injecting paraphernalia within prisons is limited.[25, 100] A recent study found that approximately 33% of self-reported HCV infections among incarcerated males in Canada may be attributable to needle sharing for illicit drug injection,[101] and an external evaluation concluded that 21% of HIV infections among IDU in Vancouver may have been acquired within prisons.[102] Furthermore, while this heavy reliance on a law enforcement approach has put marginalized populations at higher risk of drug-related harms,[22, 103] it appears to have had little effect on illicit drug availability and drug prices in this setting.[69] Consistently, our data suggest that the availability of illicit drugs has been relatively high and stable over the years, with crack cocaine being the most easily obtainable drug on the market. Illicit drug prices have also remained

unchanged over the period spanning the federal government's National Anti-Drug Strategy, pointing to the limited impact of heavy policing methods on controlling drug supply locally. Clearly, there is an urgent need to reevaluate the overreliance on enforcement methods, as well as a need to explore alternative policy approaches to illicit drug control.[104] Indeed, a growing number of countries have been experimenting with alternative regulatory approaches to illicit drugs. In Portugal, the decriminalization of personal possession of illicit drugs coincided with a decline in incarceration among PWUD and an increase in rates of addiction treatment use.[105, 106]

Our data indicate important gender differences with respect to characteristics of violent attacks experienced by PWUD. Consistent with prior studies, female IDU, especially sex workers, are highly vulnerable to sexual assault and subsequently are at higher risk of HIV and HCV infection due to gender inequities that persist among this population.[107–109] Efforts have been made to improve the health of sex workers in Canada. In 2012, an Ontario court case struck down the ban prohibiting bawdy houses.[110] However, the fact that soliciting remains illegal will continue to disproportionately affect street-level sex workers by inadvertently elevating their risk of abuse, violence and confrontations with police.[111] Law reforms to remove criminal sanctions targeting sex workers are being pursued through legal efforts that have reached the Supreme Court of Canada.[112] Regardless, given the strong influence of gender on the production of violence, future efforts to minimize violence in this setting should reflect these differences. Furthermore, previous research has proposed that environmental factors play a large role in the susceptibility of PWUD to violence; therefore, social and structural interventions to minimize violent attacks, including safe and stable housing options, employment and reforms to drug enforcement approaches, should be areas of government focus.[113, 114]

The data suggest a rising trend in reports of injection drug use cessation among PWUD in Vancouver. The drop in the prevalence of injection drug use cessation in 2005 likely reflects the fact that a replenishment of the cohort took place that year to compensate for the hundreds of deaths that occurred among PWUD, mostly due to complications arising from AIDS as well as fatal overdoses. Eligible individuals had to have reported

injection drug use in the previous month, thus reducing the proportion of PWUD who reported injection drug use cessation. Taking this factor into account, it is encouraging to see that an increasing proportion of PWUD reported injection drug use cessation for a period of at least six months. This trend is accompanied by recent declines in drug use for many drugs studied here, including heroin, and also coincides with the expansion of and improved access to drug treatment programs, given that MMT and other drug treatment services have been shown to be associated with injection drug use cessation among this population.[98, 115] Our findings provide evidence for the continued investment in drug treatment programs in order to increase uptake of these services and subsequently reduce the number of active PWUD and the incidence of HIV infection and overdose among this population.

Compared to the general population of British Columbia, mortality rates among PWUD in Vancouver remain unacceptably high, with male and female PWUD being approximately eight times more likely to die than the general population, even after adjusting for age. Recent studies both locally and internationally have listed overdose as one of the major contributors to mortality among this population.[89, 116, 117] Though a growing body of scientific evidence supports the use of supervised injection facilities as a program to avert large numbers of fatal overdoses,[118, 119] resistance from the federal government to support such harm reduction interventions has limited the expansion of this life-saving program. HIV is another major cause of mortality among PWUD in Vancouver. Given the effectiveness of highly active antiretroviral therapy (HAART) in improving survival among HIV-infected PWUD,[120, 121] along with the fact that HAART is freely available to all HIV-infected British Columbians through the BC Centre for Excellence in HIV/AIDS, efforts to scale up "seek and treat" initiatives are urgently needed to prevent the further spread of HIV infection throughout the province.[122]

It is our aim to update UHRI's *Drug Situation in Vancouver* report regularly to inform the ongoing evolution of strategies to address the city's drug problem. It is hoped that such efforts will provide a comprehensive portrait of the ways in which various policies affect drug use patterns and related issues in Vancouver.

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About the Urban Health Research Initiative

The Urban Health Research Initiative (UHRI) was established in 2007 by the British Columbia Centre for Excellence in HIV/AIDS at St. Paul's Hospital in Vancouver. Led by principal investigators Evan Wood and Thomas Kerr, UHRI is based on a network of studies that have been developed to help identify and understand the many factors that affect the health of urban populations, with a focus on substance use, infectious diseases, the urban environment and homelessness.

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