DRUG-RELATED STREET DISORDER: EVIDENCE FOR PUBLIC POLICY RESPONSES

by

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ABSTRACT

Background: The objectives of this thesis were to describe the impacts of drug-related street disorder on street-based injection drug users (IDU) in Vancouver, Canada and to explore the potential impacts of three policy interventions (low-threshold supportive housing, low-threshold employment, and supervised inhalation facilities) on the reduction of street disorder.

Methods: Data for these studies were derived from the Vancouver Injection Drug Users Study (VIDUS) which is a community recruited prospective cohort of IDU. Study participants were invited on bi-annual bases to complete an interviewer-administered questionnaire. Various multivariate regression techniques were utilized to assess factors associated with exposure to drug-related street disorder, socializing in Vancouver's open drug scene, engaging in disorderly income generation activities, and smoking crack cocaine in public areas. Further multivariate analyses were conducted to assess willingness to reduce engagement in behaviours that contribute to drug-related street disorder.

Results: At baseline, 21% of the study sample reported spending over 15 hour per day in Vancouver's open drug scene on average. Drug scene exposure was found to be associated in a dose-dependent fashion with higher intensity drug use and multiple markers of vulnerability to adverse health outcomes. In further analyses, 43% of participants reported socializing in the open drug scene for 3 or more hours per day, and having limited access to private space was the factor most strongly associated with this behaviour. Among this group 65% reported being willing to relocate if given access to more private space. 47% of participants who engaged in disorderly income generation activities were willing to forgo these income sources if given low-threshold employment, and 71% of crack cocaine smokers who reported recently using in public areas were willing to visit a supervised inhalation facility.

Conclusions: These studies highlight the importance of viewing street disorder in the context of current political, economic, and social conditions and provide a compelling body of evidence indicating that structural and environmental level interventions, specifically in the areas of housing (i.e., provision of private space), employment and supervised drug consumption facilities, are likely to have a positive influence on public health and reduce engagement in drug-related street disorder.

PREFACE

This statement is to certify that the work presented in this thesis was conceived, designed, written, and disseminated by Kora DeBeck (KD). The co-authors of the manuscripts, including Dr. Julio Montaner (JM), Dr. Doug McArthur (DM), Dr. Jane Buxton (JB), Dr. Evan Wood (EW), Dr. Thomas Kerr (TK), Ms. Ruth Zhang (RZ), Mr. Calvin Lai (CL), and Ms. Jiezhi Qi (Qi) made contributions only as is consistent with committee, collegial, or co-author duties. Specific contributions to each thesis chapter are as follows: Chapters 1 and 8: With guidance and input from JM, DM, JB, EW and TK, KD conceived and prepared the initial drafts; JM, DM, JB and TK reviewed and provided feedback on Chapters 1 and 8. Chapter 2: With guidance and input from TK, JM, JB, and DM, KD was responsible for undertaking the literature review and prepared the first draft of the review; DM contributed to the main content; and TK, JM, JB, and DM provided critical comments on the final draft. Chapter 3: With guidance and input from TK, JM, and EW, KD was responsible for study design and wrote the research protocol; RZ conducted the statistical analyses; KD prepared the first draft of the analysis; TK, JB, DM, JM, and EW contributed to the main content and provided critical comments on the final draft. Chapter 4: With guidance and input from TK, JM, and EW, KD was responsible for study design and wrote the research protocol; CL conducted the statistical analyses; KD prepared the first draft of the analysis; TK, JB, DM, JM, and EW contributed to the main content and provided critical comments on the final draft. Chapter 5-7: With guidance and input from TK, JM, and EW, KD was responsible for

study designs and wrote the research protocols; JQ conducted the statistical analyses; KD prepared the first drafts of the analysis; TK, JB, DM, JM, and EW contributed to the main content and provided critical comments on the final drafts.

All manuscripts contained in this thesis were prepared and written by KD and KD was responsible for revising the manuscripts based on the suggestions of the co-authors, submitting manuscripts for publication and preparing final revisions based on the comments of the journal editors and external peer reviewers

All research described in this dissertation was approved by the University of British Columbia/Providence Health Care Research Ethics Board; certificate numbers: P05-0234, H05-50234, H01-50086, P05-0233.

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CHAPTER 1:

BACKGROUND, RATIONAL, OBJECTIVES, AND CONCEPTUAL FRAMEWORK

1.1 Background

The ever-increasing expansion and revitalization of urban cores is generating unique pressures for city managers and policy-makers. As the density of cities increases and citizens with diverse backgrounds and interests are brought into closer proximity, tensions related to the use of public spaces may become amplified.

One common area of contention is the presence of drug-related street disorder. Drug-related street disorder can be defined as activities and behaviours associated with illegal drug use that detracts from other citizens' enjoyment of public spaces. Street disorder is often defined to include markers of 'physical' disorder, such as graffiti, litter and structural decay in neighbourhoods (e.g., broken windows), as well as markers of 'social' disorder, which refers to activities and behaviours that take place in public spaces.[1] In the context of drug-related street disorder key activities of relevance include: public drug use (consuming illegal drugs in public spaces primarily through injection and smoking); drug-related litter (including discarding needles and crack pipes in public areas); and public intoxication (loitering or socializing in public spaces while under the influence of drugs).[2-6] There are also a number of income generation activities that contribute to street disorder which, although not exclusively drug-related,

are largely driven by illegal drug use and addiction.[2, 7] These activities include: street-level drug trafficking (defined as selling illegal drugs in public spaces); street-based sex work (soliciting and communicating for the purposes of selling sex in public settings); panhandling (soliciting money or other goods from passers by in public areas); squeegee cleaning (cleaning the windshields of cars at stop lights in exchange for donations from vehicle drivers); and lastly, engagement in 'binning', recycling, salvaging or unsanctioned street-vending (collecting bottles and other goods from allies, dumpsters and other public areas that are returned for refund or sold on the street for profit) [see Figure 1.1].[2, 8-10]

In Vancouver, Canada, drug-related street disorder is particularly prevalent in an area of the city called the Downtown Eastside (DTES). This neighbourhood contains a high portion of the city's low-cost housing stock and large numbers of citizens living with mental health and addiction issues.[11, 12] Over the years the DTES has become a hub of drug market activity and drug-related street disorder is common in the area. In the early 1990s the neighbourhood was flooded with high purity heroin and cocaine which exacerbated street disorder problems and resulted in a public health disaster among people who inject drugs (IDU). Along with an explosive increase in overdose deaths,[13] researchers documented an HIV epidemic among local IDU that rivaled HIV infection rates in Botswana, Africa.[14, 15]

Many public health initiatives have been implemented to respond to the health and street disorder problems associated with problematic drug use. These have included scaling up addiction treatment services, particularly methadone maintenance,[16] restructuring the neighbourhood's needle exchange programs,[17-19] and establishing a pilot supervised injection facility in 2003.[20, 21] As a result of these efforts, progress has been made in reducing overdose deaths and HIV infection rates among people who inject drugs.[22] However, there are still significant gaps in health services for people who use drugs and street disorder remains a prominent problem in the DTES.[23-25]

In addition, drug use trends in the neighbourhood have been changing. Specifically, the popularity of crack cocaine has significantly increased in the DTES,[26, 27] yet its proliferation has not been met with an adequate public health response.[28, 29] Compared to other drug user populations, crack cocaine users are often described as a particularly high risk population. Crack cocaine using populations are found to be more likely to engage in risky behaviours[30-32] and illegal activities,[7, 33] to experience homelessness[29] and health problems,[29, 34-37] yet are less likely to access health and social services.[38] Indeed, recent research indicates that after adjusting for established risk factors, frequent crack cocaine smoking remains independently associated with HIV incidence among drug users in Vancouver.[27] In the DTES the majority of evidence-based public health responses to problematic drug use are not tailored for crack cocaine

users and do not address their unique needs.[28, 39] As a result, health and street disorder problems tend to be accentuated among people who use crack cocaine.

1.2 Study Justification

Drug-related street disorder negatively impacts communities and individuals in a number of ways. Identified problems primarily involve economic, public safety and public health concerns [see Figure 1.2]. With respect to economic considerations, street disorder is cited as creating unpleasant, unwelcoming environments that discourage retail activity and development, which in turn may harm local businesses and erode the economic vitality and growth of areas experiencing drug-related street disorder.[8, 40-44] Since street disorder is typically concentrated in urban centres, the presence of disorder is feared to undermine urban renewal efforts, which provide important commercial and real estate investment opportunities in many rapidly expanding urban settings.[45]

Alongside economic issues, public safety is another central concern with drug-related street disorder.[42] In particular, the illegal drug trade can be violent.[46] Because of the illegal status of drugs, individuals engaged in the drug trade are unable to seek assistance from law enforcement and legal institutions to settle disputes.[46] In the absence of traditional dispute resolution mechanisms and safeguards it is common in some areas for street-level drug dealers to carry weapons (including firearms), and to engage in territorial wars or use violence to resolve disputes.[41, 47] These actions often bring violence to public spaces, and engender a sense of danger among the public.

Citizens may also fear being approached in an aggressive manner by panhandlers or squeegee cleaners.[43] The erratic behaviours associated with the use of particular drugs such as crack cocaine may equally intimidate citizens and make them feel that their safety is being threatened.[48, 49] Discarded injection equipment is also perceived to pose a threat to public safety. Although incidents are extremely rare, there is concern that individuals may become infected with blood-borne diseases if accidentally pricked by a discarded contaminated needle.[5] In addition, one theory rooted in criminology and urban sociology known as 'broken windows' suggests that street disorder may create environments that attract more serious forms of crime including robbery, theft and assault and thereby may further threaten public safety.[40, 50]

Drug-related street disorder also has important public health implications. At the neighbourhood level, studies have linked neighbourhood street disorder to poor mental and physical health outcomes among neighbourhood residents.[51-55] In addition, those who partake in drug-related 'disorderly' activities are typically vulnerable individuals facing multiple negative health issues and engaging in drug-related disorder can pose additional health risks.[7, 56] In particular, it is well documented that as a result of the unregulated nature of drug markets, street-based sex workers are especially vulnerable to violent encounters and their ability to negotiate condom use can be constrained.[57-60] Similarly, using injection drugs in public settings is known to increase vulnerability among injectors. Public injecting is associated with rushing the injection process, which

can increase risk for a range of negative outcomes including drug overdose, soft-tissue damage, and acquisition of blood-borne diseases.[58, 61-65] Although the negative health impacts of engaging in street-based sex work and public injection drug use are well described, the health implications of engaging in other disorderly activities are not as widely understood. There is some evidence to suggest that individuals who engage in panhandling and related income generation activities can be the recipient of verbal hostility and physical violence;[2, 44, 66] however, the health impacts of activities such as loitering and socializing remain largely understudied.

Despite the attention drug-related street disorder is receiving from the general public and policy-makers, responses to date have been largely ineffective in addressing these behaviours and resulting harms. Indeed, law enforcement based responses have been shown to often exacerbate the harms associated with street disorder in addition to being unable to effectively respond to the activity.[62, 67-69] Therefore, alternative approaches that have potential to address drug-related street disorder are urgently required.

1.3 Study Objectives

Given the problems associated with drug-related street disorder and the lack of effective policy responses to date, the central aims of this thesis are to identify factors contributing to, explore the impacts of, and assess potential policy responses to, drug-related street disorder. Analyses will involve describing the health and social impacts of

exposure to drug-related street disorder, as well as exploring the potential impacts of three policy interventions to reduce drug-related street disorder. These interventions were selected based on a review of current literature (see Chapter 2), and feasibility for evaluation. It is hoped that the findings of this work will be used to inform more effective policy interventions in this area.

Specific Objectives and Research Hypothesis:

1. **To assess whether exposure to drug-related street disorder, in the form of Vancouver's street-based drug scene, poses public health risks.**

   Chapter 3 sets out to describe factors associated with exposure to street-based drugs scenes and determine if there is a dose dependent relationship between exposure and markers of vulnerability and higher intensity addiction. It is hypothesized that being exposed to the drug scene in Vancouver's Downtown Eastside will be associated with markers of vulnerability and that this relationship will be in a dose dependent fashion. It is also hypothesized that being exposed to the drug scene in Vancouver's Downtown Eastside will be associated with higher intensity addiction and that this relationship will be in a dose dependent fashion.

2. **To assess whether willingness measures may be effective tools for planning the delivery of public health programs for injection drug user populations.**

   Since Chapters 5-7 rely on measuring study participants' willingness to engage with various public health programs and services, it is critical to determine whether these measures have any predictive validity. To determine if willingness measures are reasonably valid tools, Chapter 4 compares prior measures for willingness to use a supervised injection facility with later attendance at the facility once it was established. It is hypothesized that reported willingness to use a supervised injecting facility, collected prior to the opening of Vancouver's supervised injecting facility, will be significantly and independently associated with using the program after it was established.

3. **To examine the relationship between access to private space and time spent socializing in an open drug scene.**

   To investigate a potential policy intervention to address a component of drug-related street disorder, Chapter 5 uses logistic regression to explore the relationship between time spent on the street socializing and housing structure (not having a private indoor place to socialize). Logistic regression is also used to profile participants that report a willingness to relocate to private spaces if such spaces were made available. It is hypothesized that spending time socializing in the open drug scene will be associated with having limited access to private

space. It is also hypothesized that if offered access to private space for socializing, willingness to relocate to private setting will be associated with markers of vulnerability.

4. **To assess engagement in disorderly income generation activities and examine the relationship between providing low-threshold employment opportunities and engaging in disorderly income generation activities.**

   To investigate another potential policy intervention to address a component of drug-related street disorder, Chapter 6 assesses engagement in disorderly income generation and the potential impact of offering alternative low-threshold employment opportunities on engagement in disorderly income generation activities. It is hypothesized that engaging in disorderly income generation activities will be associated with markers of vulnerability and high intensity addiction. It is also hypothesized that if offered low-threshold employment opportunities, willingness to give up disorderly income generation behaviours will be associated with markers of vulnerability.

5. **To characterize public crack cocaine smoking and assess whether a supervised inhalation facility has potential to address street disorder by reducing the prevalence of this behaviour.**

   Lastly, to investigate the potential for supervised inhalation facilities to reduce public crack cocaine smoking, Chapter 7 profiles public crack cocaine users and

assess willingness to use a supervised inhalation facility among public crack cocaine smokers. It is hypothesized that public crack cocaine smoking will be common among local crack cocaine users and this practice will be associated with markers of vulnerability and higher intensity addiction. It is also hypothesized that the majority of public crack cocaine smokers will be willing to use a supervised inhalation facility.

1.4 Study Design

The proposed research was undertaken using data from the Vancouver Injection Drug Users Study (VIDUS) which is a longstanding prospective community recruited cohort that began enrolling participants in May 1996. To be eligible participants had to have injected drugs in the previous month, live in the greater Vancouver region, and provide written informed consent. VIDUS participants are invited to visit the study office located in the Downtown Eastside of Vancouver on a bi-annual basis and complete an extensive interviewer-administered questionnaire. The survey elicits information pertaining to socio-demographic characteristics including housing status, income generation behaviours, sexual behaviour, and behavioural characteristics related to drug use and injection practices. Respondents are also questioned about health care utilization and use of HIV prevention and treatment services as well as any significant contact with the police and the criminal justice system. Although most of the measures on the questionnaire remain consistent over time, at each six-month study

follow-up there is an opportunity to amend the VIDUS questionnaire to add new questions of interest. At each study visit blood samples are also provided for diagnostic testing. VIDUS participants receive a stipend in the amount of $20 CDN for their time at the conclusion of each study visit. The study has received ethical approval from Providence Health and the University of British Columbia's Research Ethics Board (see Appendix I).

Data for the analyses in Chapters 3 and 4 were available from the VIDUS questionnaires administered between December 2005 and March 2009, and December 2001 to November 2005 respectively. Beginning in June 2008 measures for socializing and access to private space were added to the VIDUS questionnaire and provided data for the analyses in Chapter 5. In November 2008 measures for willingness to take up low-threshold employment and to use a supervised inhalation facility were added to the VIDUS questionnaire and provided data for the analyses in Chapters 6 and 7.

1.5 Conceptual Framework

At the broadest level, this research is informed by a theoretical approach called the 'risk environment framework'.[70] Although primarily developed in the context of risk behaviour related to HIV infection and overdose among injection drug users, the risk environment framework and the related concept of 'situated rationality' provide a useful theoretical basis to approach the problem of drug-related street disorder [see Figure 1.3].[71, 72]

In reaction to an observed overreliance on individually oriented models of behaviour change that appeared to have limited success in the area of HIV prevention and health promotion, growing numbers of public health scholars began emphasizing the importance of considering the role that social, structural and environmental factors played in shaping health related behaviours among people who use drugs.[73-79] In particular, Rhodes proposed that social, structural and environmental factors create a 'risk environment' that mediates behaviour.[70, 80] Examples of social factors include local drug use practices and peer group norms.[79] Structural factors include economic conditions (e.g., employment opportunities), laws (e.g., prohibition of drugs), social policies (e.g., access to low-threshold housing) and local policing practices, while environmental factors include features of the built environment such as public injecting environments, and neighbourhood-level conditions such as density and deprivation.[70, 80] Rhodes argues that focusing on the interplay of these factors and the 'risk environment' that they form is a better way to conceptualize and respond to the health harms associated with drug use.[79]

Unlike conventional approaches in public health dominated by the 'health belief model', the 'theory of planned behaviour' and its predecessor 'reasoned action theory', which located responsibility for health in individual actors,[81, 82] the risk environment approach gives equal attention to contextual factors that shape the lived experiences of people who use drugs.[70] From this perspective, responsibility for risk reduction and

health promotion rests not just with individuals, but also with the laws, policies, and social relations that surround individuals. In turn, targets for policy intervention extend into realms beyond the individual to include social, structural and environmental factors.[83, 84] In the current project, drug-related street disorder is viewed through a risk environment lens which suggests that at its core the problem of street disorder is not solely a matter of individuals choosing to engage in undesirable behaviour; rather, street disorder is shaped by environmental, social and structural conditions.

Another important concept informing this work is a modified version of 'rational choice theory' previously described by Rhodes and colleagues as 'situated rationality'.[72, 85] Rational choice theory presumes that individuals are primarily self-interested utility maximizers that make decisions and act based on assessments of the perceived costs and benefits of available options.[86, 87] Although the proposed research project is based in part on these assumptions, it also acknowledges that all decisions and actions are influenced by social, structural, and environmental conditions, and that these factors are particularly relevant in shaping the perceptions and experiences of people who use illegal drugs. As articulated by Rhodes, this results in a 'situated rationality' whereby the basis of decision making remains utility maximizing, but is situation specific within the context and confines of social, structural, and environmental pressures. In turn, individuals' perceptions and assessments of the costs and benefits of available options are not universal and are likely to change over time.[88]

Guided by the concept of 'situated rationality', this research proposes that despite the individual and community harms associated with it, engaging in drug-related street disorder serves various 'rational' purposes in the lives of people who use drugs when social, structural and environmental factors are taken into account. From this perspective, the types of interventions that are likely to be successful in getting individuals to reduce engagement in street disorder are ones that engage street-involved drug users and provide alternatives that fit with drug users' priorities and enable them to reduce behaviours that generate street disorder. To be effective, these interventions must also successfully influence drug users' perceptions and assessments of the costs and benefits of available options in favour of alternatives that are less harmful to the individual and the broader community. This framework is the basis for the analyses that address objectives three, four and five and Figure 1.3 outlines the three respective areas of intervention.

1.6 Summary

This thesis consists of eight Chapters. Chapter 1 provides a background to drug-related street disorder and problems associated with it. It also presents the study objectives, study design, and the conceptual framework of the thesis. Chapter 2 provides a review of the scientific literature on drug-related street disorder. This includes a summary of measures used to operationalize street disorder, as well as an overview of the impacts of previous policy approaches that have been implemented to

address this issue. Chapter 3 is the first data driven analysis and it describes the health and social impacts of exposure to drug-related street disorder. Chapters 5-7 explore the potential impacts of three policy interventions to reduce drug-related street disorder. Potential interventions that will be explored relate to housing structures (the potential impact of providing private space on time spent socializing in an open drug scene – Chapter 5), economic opportunities (the potential impact of providing low-threshold employment on engagement in disorderly income generation activities –Chapter 6) and drug consumption facilities (the potential impact of providing supervised inhalation rooms on public crack cocaine smoking –Chapter 7). To assess the potential impact of these three interventions, these analyses rely on measures of participants' 'willingness' to change their behaviour based on opportunities related to access to private space, employment, and drug consumption environments. Therefore, an additional analyis was undertaken to determine whether willingness measures were reasonable predictors of actual behaviour (Chapter 4).

Figure 1.1 Types of drug-related street disorder

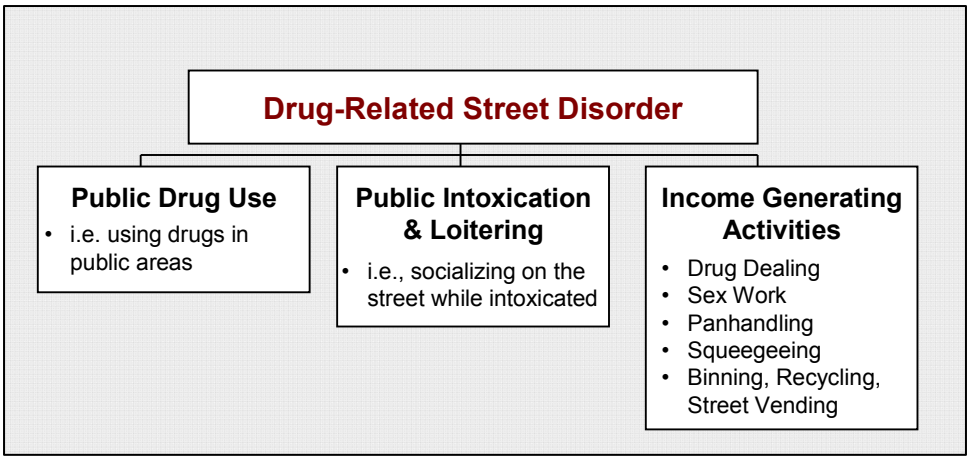


Figure 1.2 Problems associated with drug-related street disorder

Economic

- Discourages retail activity & development
- Erodes economic vitality
- Undermines urban renewal efforts

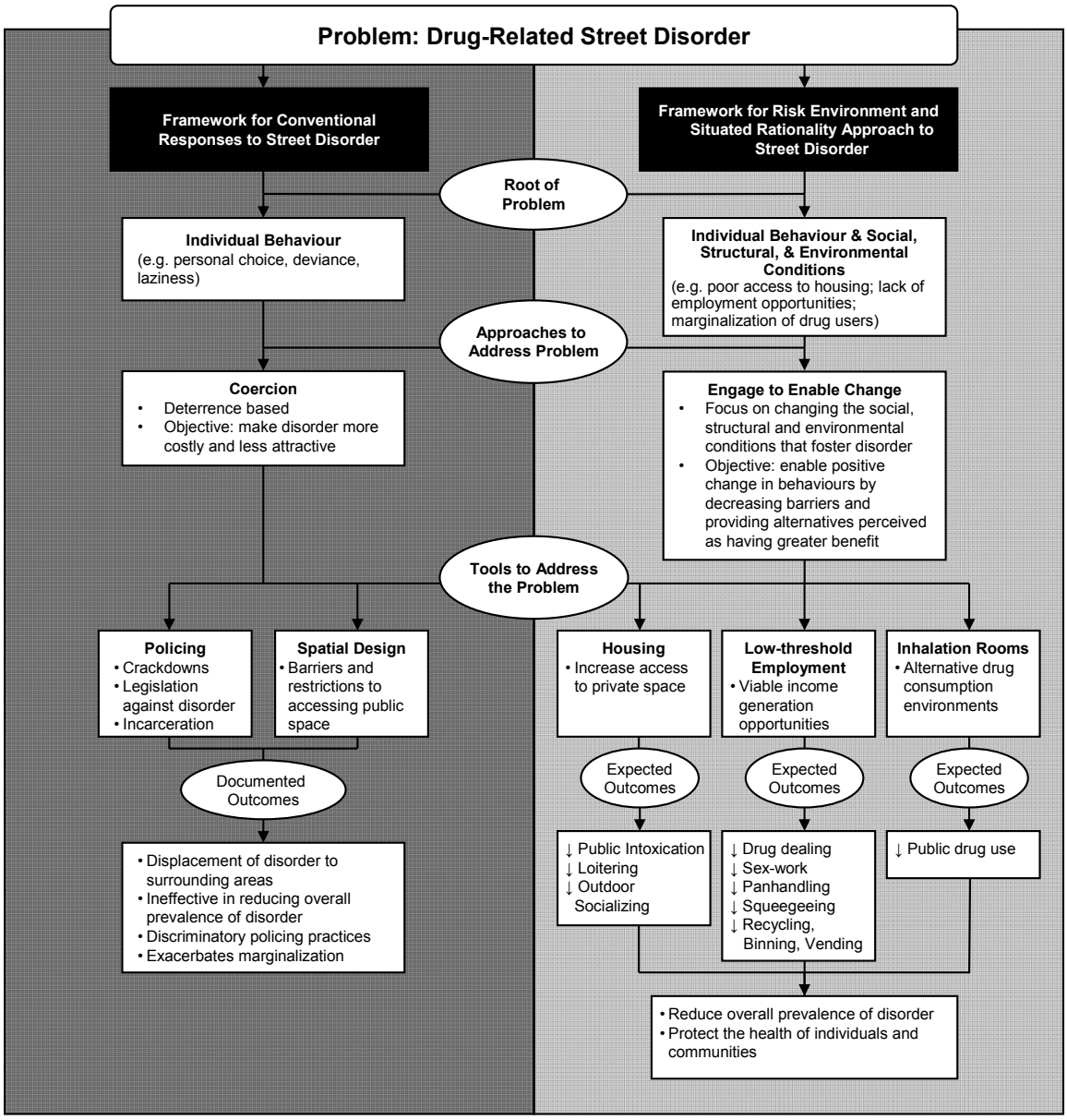
Public Safety

- Violence associated with drug markets
- Aggressive behaviour when under the influence of illicit drugs
- Discarded drug paraphernalia
- Disorder may encourage additional crime (broken windows theory)

Public Health

- Disorder linked with poor health outcomes at neighbourhood level
- Engagement in disorderly activities often poses risks to individuals (e.g. increased risk of overdose, infectious disease, soft tissue damage, violence… etc.)

Figure 1.3 Schematic of theoretical framework



CHAPTER 2:

DRUG-RELATED STREET DISORDER: A REVIEW OF MEASURES AND POLICY RESPONSES[1]

2.1 Introduction

Citizens in urban centres throughout the world consistently identify drug-related street disorder as a primary concern in their community,[25, 42, 89, 90] and in some areas street disorder is ranked as a greater concern than homicide, sexual assault, and robbery.[40, 50, 91] In turn, governments in many urban environments are increasingly directing their attention to street disorder and are introducing targeted public policies in attempts to eliminate or control public disorder, particularly disorder associated with illegal drug markets and the use of illegal drugs.

Markers of drug-related street disorder include public drug use, street-level drug trafficking, drug-related litter, public intoxication and loitering, street-based sex work, panhandling, squeegee cleaning, and engaging in 'binning', recycling, salvaging and unsanctioned street vending (collecting bottles and other goods from allies, dumpsters and other public areas that are returned for refund or sold on the street for profit).[2-6, 8-10, 25, 40, 53, 89-92] Although street disorder is not a new phenomenon, policy-makers in many urban areas have been unable to successfully manage these behaviours and continue to

[1] A version of this chapter has been submitted for publication as: DeBeck, K. McArthur, D. Drug-related street disorder: A review of policy responses.

struggle to determine how to best respond to this persistent policy issue. To provide evidence-based direction for policy-makers, a review of literature on drug-related street disorder was conducted. Street disorder is a broad topic encompassing many activities and areas of research. To manage the breadth of available literature, the scope of this review concentrates on methods of measuring street disorder and the impacts of current interventions introduced to address street disorder. The objectives of this review are to: 1) identify and summarize methods that have been previously employed to operationalize and measure drug-related street disorder, and 2) provide an overview of evidence documenting the impacts of strategies that have been implemented in urban settings to address drug-related street disorder.

2.2 Review Methods

Published studies for this review were identified by conducting computerized searches of Medline, PubMed, Science Citation Index Expanded, Social Sciences Citation Index, and PAIS (Public Affairs Information Services). Search terms included "public disorder", "public drug use", "street-level drug dealing", "panhandling", "public intoxication", "street-level sex-work" "broken windows", "order-maintenance", "quality-of-life policing", and "crime prevention through environmental design". Additional materials were located by reviewing bibliographies of relevant publications. While the review focused on peer-reviewed literature, some consideration was also

given to pertinent government and public agency reports. The search was limited to English language publications and there were no time period restrictions on materials.

2.3 Review Findings: Measuring Drug-Related Street Disorder

Studies of street disorder have utilized a number of approaches to measure physical and social markers of public disorder. Selected from the broader literature of public disorder, this section outlines measurement approaches appropriate to the study of drug-related street disorder. One common approach to measure public disorder is to use perceptions of street disorder reported by individuals who reside in or are in some way exposed to a geographically defined area of interest. Surveys, qualitative interviews and focus groups with residents, local merchants, local police and relevant city workers have all been used in studies of public disorder to elicit perceptions of the frequency and prevalence of street disorder.[2, 53, 68, 92] One benefit of this approach is that data on a wide range of activities relevant to drug-related street disorder can be collected; as well, recruiting a sample of civilians is highly feasible for most investigators. However, evidence suggests that perceived measures of disorder may be influenced by fear of crime and previous victimization experiences which will bias some measures of perceptions of disorder.[1, 93]

Other studies have directly surveyed and interviewed local drug users or street-involved persons as a means of collecting self-reported levels of engagement in drug-related street disorder.[6, 7, 10, 56] This approach is beneficial as it can capture a wide range

of activities relevant to drug-related street disorder and will capture activities not directly observed by others. However, recall issues and socially desirable reporting may weaken the reliability of self-reported measures of engagement in drug-related street disorder.[94] As well, obtaining a representative sample of street-involved drug users requires considerable resources and may not be feasible in some settings.

Official data capturing the number of policing responses to or arrests for disorderly activities can also be used as an indicator of street disorder.[53] A benefit of using official data is that it is already collected and generally readily available. However, there are a number of limitations with this approach. For one, many acts of disorder do not get reported to police. In addition, official statistics are directly influenced by the level of policing activity; hence, they may reflect policing efforts or focus more than the prevalence or incidence of disorderly activities. [49, 95] Furthermore, in many jurisdictions police officers' performances are gauged by arrest statistics, which generates a potential source of bias.[96, 97]

Street disorder has also been measured by the number of civilian complaint calls made to emergency services, tip lines, and city officials regarding disorderly activities.[2, 53, 91] Compared to official statistics this approach is often considered a better indicator of disorder as it is not bias by the level of police activity.[91] However, complain calls only capture a limited range of disorderly activities, typically only very disruptive behaviours.

Another recognized but labour intensive approach to measuring street disorder is through 'Systematic Social Observations' (SSO).[92, 98] SSO involves using multiple independent means to systematically record observations, which are replicated over time.[1, 53] Typically, SSO involves driving through a neighbourhood with a recording video camera as well as trained observers, each of whom are recording the number of present indicators of street disorder on each street block. While the trained observers are recording observations in real time, the video provides a permanent record that allows coding and measures to be replicated by independent observers. For drug-related street disorder potential relevant indicators include the presence and frequency of: injection related debris; people injecting drugs in public; people smoking drugs in public; intoxicated individuals loitering or congregating; individuals panhandling or squeegee-cleaning; individuals who appear to be selling sex; and individuals going through street garbage, collecting bottles, or vending.[53] An important strength of this approach is that the video recording allows for the coding of indicators of disorder to be replicated which can detect observer bias and errors in differential classification or differential measurement of objects and events; this provides greater reliability of recorded observations.[92, 98] Furthermore, the SSO approach captures more indicators of disorder than official statistics or civilian complaint calls. In addition, SSO is not vulnerable to biases of perceived measures of disorder as it captures directly observed events of disorder.[97] There are, however, limitations to the SSO approach. Specifically,

SSO is costly and very labour-intensive.[99] In addition, SSO is vulnerable to observer effects.[97, 98]

A variation on SSO is basic observation of street disorder in which trained observers pass through an area of interest and code events and observations relevant to street disorder. The difference, however, is that these observations are not replicated or verified by video or any other permanent record of events. Direct observation is less costly than SSO and can capture a wide range of relevant indicators of drug-related street disorder, which is beneficial. However, direct observation, like SSO, is vulnerable to potential observer effects. The key components of each measurement approach and studies in which each method has been utilized are summarized in Table 2.1.

Table 2.1 Summary of measures appropriate for drug-related street disorder

Measurement	Description	Strengths	Limitations	Studies
Perceived	• Surveys, qualitative interviews, and focus groups with residents, local merchants, police, city workers and others exposed to neighbourhood or area of interest • Questions relate to prevalence and frequency of indicators of interest	• Gathering data is highly feasible • Can capture wide range of activities relevant to drug-related street disorder	• Perceptions of disorder can be influenced by fear and past experience of victimization, hence reports of disorder may be biased	• Skogan 1990[40] • Zimmer 1990[68] • Perkins et al. 1992[93] • Perkins & Taylor 1996[100] • Ross et al. 2000[55] • Sampson & Raudenbush 2004[53] • Salmon et al. 2007[101] • Cusick & Kimber 2007[42]
Self-Report	• Surveys of active drug users (or street-involved persons) to assess engagement in drug-related street disorder	• Can capture activities not directly observed by others • Can capture wide range of activities relevant to drug-related street disorder	• Resource intensive to recruit representative sample • Socially desirable reporting • Recall issues	• Lee & Farrell 2003[56] • Navarro & Leonard 2004[6] • DeBeck et al. 2007[7] • Shannon et al. 2007[60] • DeBeck et al. 2009[3]
Official Statistics	• Police responses and arrests for disorderly activities	• Data already compiled, often readily available	• Reflects police efforts • Potential tampering of statistics • Limited range of activities recorded	• Green 1995[102] • Weisburd & Mazerolle 2000[91] • Sampson & Raudenbush 2004[53]
Civilian Complaint Calls	• Complaint calls to 911, city officials & tip lines re: disorderly activities	• Not biased by police activity	• Limited range of activities recorded; only particularly disruptive behaviours	• Sherman & Weisburd 1995[103] • Cohen et al. 2003[54] • Weisburd & Mazerolle 2000[91]
Systematic Social Observation	• Multiple independent systematically recorded observations replicated over time • Involves filming and having trained observers record observations in log	• Can measure wide range of aspects of street disorder • Filming allows for replication & greater reliability • Captures observed rather than perceived measures	• Labour intensive and expensive • Potential for observer effects	• Reiss 1971[98] • Sampson & Raudenbush 1999[1] • Sampson & Raudenbush 2004[53]
Direct Observation	• Trained observers pass through area of interest and code events and observations relevant to street disorder	• Like SSO, avoids potential perception bias • Can capture wide range of activities relevant to drug-related street disorder	• Potential for observer effects • Unlike SSO, reliability of measures and classification of observations are not easily verified	• Perkins 1992[93] • Koper 1995[97] • Sherman & Weisburd 1995[103] • Perkins & Taylor 1996[100] • Cohen et al. 2000[52] • Caughy et al. 2001[99] • Wood et al. 2004[104]

2.4 Review Findings: Responding to Drug-Related Street Disorder

A review of the published literature identified a range of policy responses implemented to address drug-related street disorder (see Table 2.2). These responses primarily fit into the categories of law enforcement (police crack-down campaigns, order-maintenance policing, problem-oriented policing, hot-spot policing and increasing police powers through legislation) environmental design, and engaging interventions consistent with public health principles (supervised injection facilities, addiction treatment, and low-threshold employment programs). As outlined in Table 2.2, some responses target a broad range of activities that generate street disorder while others focus on particular behaviours or components of disorder. An overview of each response and current evidence of its impacts are presented below. Evidence of the impacts of each response are also summarized in Table 2.3.

2.4.1 Law Enforcement Approaches to Address Drug-Related Street Disorder

2.4.1.1 Police Crack-Down Campaigns

Police crack-down campaigns are a widely employed response to drug-related street disorder[62-64] and can be described as temporary dramatic increases in police presence to increase the threat of apprehension and punishment for criminal or misdemeanour offences.[105] Police crack-downs can be offense-specific such as targeting parking violations or drunk driving. Alternatively, they can be geographically focused and involve the strict enforcement of all types of offences in one particular area. Tactics used in police crack-downs of open air drug markets include increasing police patrol

and surveillance, raiding drug dealing locations, and increasing arrests for observed drug transactions, undercover drug buys, and unrelated misdemeanour violations.[63, 105, 106]

Studies evaluating the impact of police-crackdowns have found that they are generally effective in reducing drug market activity during and often immediately after crack-down operations.[63, 107] However, visible reductions in drug market activity are usually temporary, and the deterrent effect rarely lasts after the intervention has ceased.[62, 105, 108] Studies exploring the impact of crack-down campaigns on the price and frequency of drug use among local drug users found no discernable impacts, suggesting that the impacts of crack-downs are limited to the visible reduction of drug-related street disorder.[69, 109] Despite the moderate benefits of police crack-downs on the visibility of drug-related street disorder, these approaches have been associated with a wide range of serious negative consequences.

One of the most well-documented unintended consequences of police crack-down campaigns is displacement.[69, 110] Research to date suggests that typically policing efforts do not decrease the overall prevalence of disorderly activity, but instead displace it to surrounding areas.[48, 62, 64, 67-69, 107, 108] This can have a number of negative implications for the individuals engaging in disorderly activity, as well as for the surrounding communities where the activity relocates.[62, 111, 112] In particular, displacement interrupts and discourages contact between marginalized drug users and health services[107] and

may increase the risk of fatal drug overdose as injection drug users have been found to relocate to more isolated locations during periods of police crack-downs.[113, 114]

By disrupting drug markets, police crack-downs have also been associated with increasing levels of violence in surrounding area.[62, 108, 115] Furthermore, high levels of police misconduct have been documented during periods of crack-downs, specifically, unnecessary use of force and illegal searches.[116] Other concerning findings include the impact of crack-downs on injecting practices among injection drug users. It has been reported that crack-downs reduce injection drug users' access to HIV prevention supplies (condoms, syringes),[106, 107] and fear of police searches make drug injectors reluctance to carry clean syringes.[63, 64, 107, 116] Reduced access to and fear of carrying HIV prevention supplies increases the chances of engaging in unprotected sex and used syringe sharing which are the leading routes of transmission for HIV and other infectious diseases.[117, 118] In response to increased police surveillance of open drug scenes during crack-downs, IDU also report being more likely to rush their injections which often results in skipping important overdose and HIV prevention steps as well as other safety measures.[62, 63, 106, 107] The pressure to rush injections due to fear of police has also been found to discourage safe needle and syringe disposal as injectors report being reluctant to carry their used syringes to safe deposit locations.[62, 64, 107] In some settings to prevent being arrested by police during crack-downs, drug users have been found to store drugs in their mouth or nasal cavities and will swallow drugs when they are

stopped by police to avoid having drugs discovered.[64] These behaviours pose risks of spreading infections as well as accidental overdose.

Other concerning outcomes associated with police crack-downs include increasing stigma and marginalization of people who use drugs, which is associated with increasing HIV risk and undermining important public health objectives, as well as increasing rates of arrest and incarceration among people who use drugs.[106] Although arresting and incarcerating larger numbers of individuals may provide short-term benefits by limiting their opportunity to engage in disorderly behaviour, incarceration is associated with many negative individual and community consequences. These include disrupting family structures, increasing alienation and stigma, increasing risks of HIV infection and other health harms including fatal drug overdose, and creating barriers to labour market participation, all of which damage community ties and may actually perpetuate further disorderly and criminal behaviour.[119-1252, 124, 125]

In summary, current evidence suggests that police crack-down campaigns can reduce the visibility of street disorder but those benefits are associated with many serious negative unintended consequences.

2.4.1.2 Order-Maintenance Policing Based on the Broken Windows Theory

Another law enforcement approach that is relevant to street disorder is 'order-maintenance policing'. This approach is rooted in the 'broken windows theory' and focuses on the aggressive enforcement of misdemeanour violations as a means of maintaining order in public areas.[50] The central premise of the broken windows theory

is that street disorder, including panhandling, public drug dealing, litter, and graffiti, makes neighbourhoods susceptible to more serious crime. The proposed mechanisms by which these forms of disorder would breed serious crime are multifaceted. Specifically, it is suggested that public disorder sends signals to potential criminals that residents in 'disorderly' neighbourhoods are apathetic and unlikely to be vigilant of suspicious activity in their community. This is said to make these neighbourhoods appealing targets for more serious crime. Additionally, it is suggested that public disorder deters non-criminally-involved citizens from occupying public spaces, which in turn leads to unmonitored environments that further encourage potential criminals to offend.[50] The broken windows theory suggests that to reduce serious crime and protect public safety it is critical for police officers to focus their efforts on maintaining strict order in public areas and aggressively enforce all misdemeanour violations. This type of order-maintenance policing based on the broken window theory has gained traction in many policy circles and its emphasis on police targeting and punishing acts of disorder has been incorporated into the policing culture of many urban areas.[126] Although the chief objective of order-maintenance policing is to deter more serious forms of crime, its target is street disorder. Therefore, a presentation of research related to the impacts of order-maintenance policing is relevant to this review of policy responses to street disorder.

The most widely cited example of order-maintenance policing has been in New York City (NYC) in the early 1990s under Mayor Rudolph Giuliani.[49, 68, 92] Following the

implementation of NYC's order-maintenance policing initiative, misdemeanour arrest rates in the city increased significantly,[49, 127] and throughout the 1990s the physical appearance of disorder on the streets decreased dramatically and the rate of serious crime, including homicides, declined.[49, 128] As a result, NYC's order-maintenance policing initiative is often cited as an example of the effectiveness of order-maintenance policing and the broken windows theory and has been used to legitimize the employment of this approach towards street disorder in jurisdictions as far away as Great Britain.[48, 49]

The apparent success of New York's policing initiative has, however, been widely contested and many competing explanations have been put forward to account for the dramatic reduction in criminal activity in NYC.[49, 124, 128] These include changes in patterns of crack cocaine use and distribution and changes in the American economy and labour markets. [48, 49, 128] Furthermore, the decline in rates of homicide and other serious crime was not exclusive to NYC, nor did it begin after NYC's order-maintenance policing initiative was implemented. Indeed, national homicides rates began to decline in 1991 (two years before NYC's initiative was introduced),[48, 92] and other cities that did not implement new policing practices experienced similar, and at times even more dramatic, declines than those observed in NYC.[48, 92, 127] In addition, aggressive policing initiatives that have been implemented in previous time periods have actually coincided with increases in homicide rates.[48] These observations suggest that aggressive policing

of street disorder is neither a necessary nor a sufficient element to reduce homicide and other serious crime.

These factors highlight that there are multiple potential explanations for the reduction in crime observed in NYC. When taken together it suggests that the links between New York's order-maintenance policing initiative and support for the broken windows theory are unconvincing. Indeed, to date there is no reliable scientific evidence in the peer-review literature to validate the accuracy of the broken windows theory. Although a number of large scale studies report a tenuous relationship between markers of public disorder and robbery, after adjusting for important neighbourhood characteristics such as poverty and race, these studies found no significant connection between street disorder and all other markers of serious crime, including homicide, burglary, physical assault, sexual assault, and purse-snatching/pick-pocketing.[1, 40, 92, 129]

Studies specific to NYC undertaken by Kelling and Sousa (2001) and Corman and Mocan (2005) reported significant inverse relationships between misdemeanour arrests and rates of violent crime.[130, 131] However, a later study by Harcourt and Ludwig (2006) that used improved measures for key indicators and attempted to address other weaknesses in the Kelling and Corman studies was unable to replicate these findings.[132] A more recent study by Messner and colleagues (2007) analysed misdemeanour arrests and homicide rates disaggregated into gun-related and non-gun-related homicides in New York City.[49] They found that while misdemeanour arrests were inversely related to

gun-related homicides, there was no relationship between misdemeanour arrests and non-gun-related homicides in New York City. The failure to detect a relationship between misdemeanour arrests and both types of homicides indicates that New York's 'quality-of-life' initiative does not lend support to the broken windows theory.

Although the evidence-base to support the crime reduction benefits of order-maintenance policing is unconvincing, similar to police crack-down campaigns, its impact on reducing the visible signs of disorder appear to be successful.[49, 124] However, also similar to police crack-down campaigns, order-maintenance policing has been associated with a number of unintended negative impacts. These include displacement,[48, 67, 68] as well as racial profiling and prejudicial enforcement of laws. For instance, one study analysing the application of New York's order-maintenance initiative found that instead of allocating policing efforts based on the level of physical disorder present in a neighbourhood, policing attention was concentrated in neighbourhoods with large ethnic minority populations. As a result, this order-maintenance policing initiative exposed neighbourhoods characterized by poverty and social disadvantage to the highest levels of policing.[127] Given these findings it is not surprising that order-maintenance policing initiatives have also been found to lead to the disproportionate incarceration of minority groups.[133] As previously noted, incarceration is associated with many harms including increased stigma and heightened risks for HIV infection and other negative health outcomes.[119-125]

Order-maintenance policing has also been linked with police misconduct including corruption, excessive use of force and human rights abuses.[40, 48, 49, 49, 116, 124] The number of civil rights claims filed against New York police for abusive conduct was reported to have increased by 75% in the years following the introduction of the city's order-maintenance initiative. In addition, civilian complaints filed with the Civilian Complaint Review Board increased by 60% during this period.[124] It is noteworthy that also during this time San Diego, which did not implement aggressive order-maintenance policing, experienced a reduction in complaints filed against its police force, even though the city also enjoyed reductions in its crime rates comparable to New York City.[124] Surges in police misconduct complaints have been found to undermine trust and good relations with citizens and may create hostility in a community.[48, 134]

A review of evidence indicates that order-maintenance policing and police crack-down campaigns share many of the same unintended negative impacts while producing limited benefits that do not translate into the long-term sustainable reduction of street disorder, or other indicators of crime.

2.4.1.3 Problem Oriented Policing

Problem-oriented policing can be described as a collaborative, community oriented approach to policing where the role of police includes engaging with the communities they work in to consider the root causes of crime and disorder and identify potential solutions which are then implemented and evaluated.[49, 135] With this approach the primary emphasis for police officers is to work to prevent crime and

address neighbourhood crime issues.[92] Although studies evaluating the impacts of problem-oriented policing report are limited,[136, 137] some positive effects on reducing street disorder have been documented,[138] and a recent meta-analysis of problem-oriented policing interventions found they had a significant, although marginal, effect on street disorder.[139] Despite these positive findings, review authors acknowledge that the evidence-base to support problem-oriented policing is weak and conclude that there is insufficient evidence to support the level of endorsement governments and police agencies have been directing towards problem-oriented policing.[139] No studies were identified that document negative consequences associated with problem-oriented policing.

2.4.1.4 Hot-Spot Policing

One variation of these aforementioned law enforcement based approaches is 'hot-spot' policing which involves concentrating policing efforts in areas with high levels of drug market activity and disorder.[91, 97] Policing tactics within the 'hot-spot' approach vary widely and include police crack-downs and raids,[95, 140] problem-oriented policing,[141] and increased patrol and surveillance.[97, 142] A number of studies evaluating the impacts of various types of 'hot-spot' policing report measurable short-term reductions in markers of street disorder,[97, 138, 142] including disorder-related emergency calls for services,[140] and drug dealing in the area.[95] Consistent with studies of specific policing approaches, there was little evidence to suggest that these effects were sustained long-term. Although one study had a post intervention assessment period of

seven months and found sustained effect at this time, other studies noted that initial reductions in street disorder largely disappeared once the targeted enforcement campaign ceased.[95] Two studies were identified that considered whether policing interventions in two particular instances were accompanied with displacement of disorder and found no evidence of significant displacement.[138, 140] No other studies were identified that considered unintended negative consequences specific to hot-spot policing; however, the unintended consequences associated with the previously described law enforcement approaches (i.e., police crack-down campaigns, order-maintenance policing) would still be relevant to the hot-spot interventions that employed these approaches.

2.4.1.5 Increasing Police Powers Through Legislation

Increasing police powers through legislation specifically designed to provide law enforcement officers with additional powers to regulate activities in public spaces is another law enforcement based approach that has been used to address street disorder.[43, 143, 144] Although this enforcement tactic can be implemented to support police crack-downs or order-maintenance approaches, it can also be implemented independently. Common elements of legislative initiatives, such as the 'Safe Streets Act' in Ontario and British Columbia, Canada, including placing restrictions on the time, manner and location that panhandling may occur.[8] These types of legislative measures allow law enforcement officers to more directly intervene and control people engaged in certain disorderly behaviours. The use of additional powers granted through

legislative initiatives has been noted to accomplish reductions in markers of street disorder.[68, 97, 105, 124, 140] However, legislation banning or strictly regulating certain behaviours (such as panhandling) in public spaces has in many instances been found to violate civil liberties.[8, 133] No studies were identified that assess the impact of this approach on displacement or other potential relevant impacts.

2.4.1.6 Summary of Law Enforcement Based Approaches

Despite moderate benefits in the visible reduction of street disorder, current evidence suggests that most law enforcement based approaches are associated with serious unintended consequences, which include displacing street disorder, increasing violence, police misconduct, compromising HIV and drug overdose prevention, racial profiling, increasing stigma and discrimination, and increasing overall incarceration rates among vulnerable drug using populations. The extent of these negative impacts appears to overwhelm the marginal benefits of drug law enforcement and suggests that alternative approaches are urgently required.

2.4.2 Environmental Design Approaches to Address Drug-Related Street Disorder

Given the limits of conventional law enforcement based approaches, 'Crime Prevention Through Environmental Design' (CPTED), also known as 'Situational Crime Prevention', has received increasing attention as a potential method to control drug-related street disorder.[25, 42, 67, 83] By way of strategies related to territoriality (defined as ensuring that all spaces have a clearly defined and apparent purpose), surveillance, access control, and target hardening (defined as making locations difficult to access or

penetrate), CPTED proposes that altering features of the built environment can increase the perceived costs of committing criminal or disorderly acts (i.e., increase perceived risk of apprehension), which in turn deters crime and undesirable behaviours such as street disorder.[145, 146] A key assumption inherent in CPTED is that potential offenders or disorderly people make rational calculated decisions about the potential costs and benefits of their actions that can be manipulated through changes to the built environment.

Typical design features to deter crime and disorder include: installing lighting, fences, gates, and closed circuit television cameras, as well as altering landscapes to increase visibility and remove potential hiding spots.[42, 145, 146] In the context of drug-related street disorder, proposed design features to deter activities related to public disorder involve removing public water taps to restrict access to water for drinking and washing, restricting access to restrooms, locking unsecured garbage dumpsters, and blocking access to protected areas where people can sit or lie down.[2, 25, 67] One strength of environmental design approaches is that compared to law enforcement approaches, they are typically inexpensive and easy to implement.

Existing evaluation studies of environmental design interventions have been undertaken to assess their impact on deterring criminal behaviours specific to property crime, theft and robbery and do not directly consider behaviours associated with drug-related street disorder.[145, 146] Nevertheless, there is limited evidence suggesting that

environmental design may play a role in reducing certain crimes in certain situations and that potential effects are likely mediated by social and economic factors.[83, 146-148] However, to date none of these studies provide evidence that empirically demonstrates the effectiveness of environmental design in crime reduction and no evidence was located that suggests environmental design reduces street disorder.[145, 146]

Although the evidence-base surrounding environmental design is limited,[146] concerns identified with employing environmental design strategies include displacing undesirable behaviours and negatively impacting minority groups. Similar to law enforcement based interventions, environmental design interventions have been found to displace undesirable behaviour to surrounding areas.[147] As previously mentioned, displacement is known to have a number of negative health consequences both for the individuals engaged in the disorderly behaviour, as well as for the communities where the behaviour relocates.[62, 67, 69, 106, 110] Furthermore, as with order-maintenance approaches, efforts to regulate and control public spaces through surveillance and other environmental design features have been found to disproportionately affect and exclude marginalized populations.[83] While environmental design interventions are typically inexpensive and easy to implement, there is no evidence to suggest that they reduce disorderly activity and there is evidence to suggest they displace behaviour and negatively affect marginalized populations.

2.4.3 Engaging Interventions that Enable Behaviour Change

Compared with law enforcement and environmental design interventions, which are largely coercive in their approaches to deterring disorderly behaviour, engaging interventions that enable behaviour change represent a different type of response to drug-related street disorder. Engaging interventions are consistent with public health principles and recognize the importance of promoting and enabling behaviours that protect health and limit risks. Examples of engaging interventions include many addictions-focused public health programs that aim to engage marginalized drug using populations and connect them with appropriate health and social services.[149] Although few of these engaging addictions-focused public health programs are implemented to specifically address street disorder, there are a number that have been evaluated in the context of street disorder. These include supervised injection facilities, addiction treatment programs, and low-threshold employment programs.

2.4.3.1 Supervised Injection Facilities

Supervised injection facilities (SIFs) represent an engaging intervention that is explicitly intended to address aspects of drug-related street disorder.[20, 150, 151] By providing a hygienic environment where drug users can inject illegal drugs without fear of arrest or harassment, SIFs offer a unique alternative for street-based injection drug users. [20, 150, 151152] Within SIFs, clients are provided with sterile injecting equipment and emergency intervention in the event of an accidental overdose, as well as medical

care either on site or through referral.[153, 154] There are now approximately 65 sanctioned supervised drug consumption facilities in operation internationally.[155]

The impact of SIFs on street disorder has been rigorously evaluated in Australia and Canada using both community perception surveys and direct observation techniques. Results suggest that SIFs are effective in reducing both observed and perceived measures of public injection drug use and injection related debris in areas surrounding injection facilities.[101, 104] Vancouver-based studies have sought to measure potential unintended negative consequences of SIFs but found no adverse changes in community drug use patterns,[156] no increases in initiation into injection drug use,[157] and no increases in drug-related crime associated with the establishment of Vancouver's SIF.[158]

Despite evidence of positive impacts on the reduction of street disorder and no evidence of adverse impacts, the coverage of SIFs remains minute compared to the prevalence of public drug use and drug-related street disorder. SIFs in Australia and Canada are single pilot trial facilities and are not comprehensive programs of supervised injecting. Capacity constraints resulting in long wait times to access the Vancouver injection facility have been identified as a leading factor contributing to public drug use among local injectors.[159] To date, no SIFs have been implemented in the United States.

2.4.3.2 Addiction Treatment

Addiction treatment programs are another highly relevant engaging public health intervention in the context of street disorder. There are many different types of addiction treatment including behavioural and pharmacological treatments (drug substitution and maintenance therapies), and the objectives of addiction treatment range from reducing illicit drug use to full abstinence from all drug use.[160]

Reducing drug dependence and use through substitution, maintenance, or abstinence-based addiction treatments have all been found to limit participation in drug-related street disorder, particularly participation in disorderly income generation activities.[161-165] In particular, a wide body of literature has found that methadone maintenance is an effective treatment for opiod addiction and is associated with reductions in participation in disorderly income generation activities.[162] Similarly, heroin maintenance trials including the most recent *North American Opiate Medication Initiative* (NAOMI) trial, found that prescribing injectable diacetylmorphine (the active ingredient in heroin) reduced the use of and need to purchase illicit street drugs, which has a direct positive impact on reducing participation in disorderly income generation activities.[163]

Although the links between addiction treatment and reductions in participation in disorderly income generation activities are well established, the long-term drug use patterns of injection drug users suggest that drug addiction is often a chronic relapsing condition and addiction treatment success is typically periodic and followed by periods

of relapse into drug use.[166-169] Furthermore, there are currently no substitution or maintenance treatment therapies for stimulant drug users. The overall effectiveness of current addiction treatment modalities to reduce participation in disorderly income generation activities is limited.

2.4.3.3 Low-Threshold Employment Programs

The effects of drug addiction and street-entrenchment often make it difficult for illicit drug users to obtain and retain formal employment. Formal employment typically requires employees to abstain from drug use and follow a regular work schedule which is often unrealistic for many street-based drug users.[33, 170-174] Given the barriers to engaging in formal employment, it is common for drug users to resort to prohibited income generation strategies that contribute to drug-related street disorder.[7, 171] Although there are employment programs targeted towards people who use drugs, they are often integrated into addiction treatment programs and intended to support addiction recovery.[172] As a result, these types of employment programs are inaccessible for active drug users and are therefore unable to address disorderly income generation activities.

Conversely, low-threshold employment programs are an alternative strategy that initial research suggests can engage street-involved drug users and reduce their participation in some types of disorderly income generation activities. The concept of 'low-threshold' is to create programs that are easily accessible for active drug users and a key component of low-threshold programs is that they do not require abstinence from

drug use. An evaluation of a jewellery making economic empowerment program for women who use illicit drugs found the program was associated with significant reductions in engaging in sex work.[175]

Additional studies evaluating the impacts of low-threshold employment programs on disorderly income generation were not located and the prevalence of these initiatives appears sparse. However, a limited number of low-threshold employment opportunities in Vancouver, Canada were identified. These include a community café and catering social enterprise company that offers an estimated nine low-threshold employment positions,[176, 177] as well as an organization that processes recyclable containers which provides roughly 33 low-threshold positions[178, 179] and a photo calendar project initiated by a social justice organization that offers a program for residents of Vancouver's drug use epicentre to become vendors and sell calendars and books.[180-182] Active drug use does not preclude participation in any of these employment opportunities. Given initial positive findings of low-threshold employment programs on disorderly income generation in other settings, evaluating the impacts of the above identified low-threshold employment programs in Vancouver appears warranted. The expansion of low-threshold employment opportunities may present an important opportunity to significantly reduce participation in components of drug-related street disorder.

2.5 Conclusions and Next Steps

The findings of this review indicate that although law enforcement-based approaches are the most commonly employed response to drug-related street disorder, their impacts are typically short-term and are often accompanied by negative unintended consequences, including displacement and a range of harmful public health and community impacts. Similarly, although environmental design interventions may have limited impact on the visible reduction of street disorder, these marginal gains are associated with unintended consequences including displacement and the exclusion of marginalized populations. Conversely, interventions that are in line with public health principles and engage drug users to enable them to change their behaviour are not associated with serious unintended negative consequences; however, their impacts on street disorder are restricted by a number of factors. In the cases of SIFs and low-threshold employment, limited coverage appears to be a key constraint suggesting that the expansion and further development of these interventions should be pursued. While there is a need to scale up and expand existing interventions that have a demonstrated positive impact on the reduction of markers of drug-related street disorder, given the identified limitations with the current range of interventions to address drug-related street disorder, consideration for underexplored and innovative interventions should also be a priority for health and policy research.

2.5.1 Underexplored and Innovative Engaging Approaches

Specific engaging public health programs implemented for purposes unrelated to street disorder can directly impact the prevalence of drug-related street disorder; however, in many instances this impact has not been recognized. Low-threshold supportive housing is an example of an engaging intervention that has been underexplored in connection to drug-related street disorder. While the benefits of providing low-threshold supportive housing for marginalized populations have long been recognized in the context of physical and mental health,[183] the relationship between low-threshold housing, access to private space and engagement in public disorder has not been fully explored. Indeed, homelessness has been found to be a key predictor of public injection drug use and surveys of individuals engaged in other disorderly behaviours repeatedly identify this population as under-housed,[3, 6] suggesting that using drugs and loitering in public spaces may be a function of having limited access to private space. Hence, low-threshold housing programs may have potential to greatly reduce some disorderly activities if they provide individuals with private spaces that accommodate socializing and drug use.

Based on the successes of opiod maintenance and substitution treatment therapies, one promising area for innovative exploration is developing drug substitution and maintenance addiction treatment programs for stimulant drug users. Similarly, based on the successes of SIFs, the potential for supervised inhalation facilities to provide alternative locations for crack cocaine and methamphetamine

smokers to consume drugs should be evaluated. Inhalation facilities operate in Europe; however, their impact on street disorder has not been formally evaluated.

2.5.2 Summary

In summary, this review finds that law enforcement and environmental design based interventions do not appropriately manage or meaningfully reduce drug-related street disorder while engaging interventions consistent with public health principles are not associated with serious unintended consequences but tend to be limited in their impact due in part to limited coverage. Based on the success of engaging public health approaches, further research should be directed towards identifying innovative interventions to address street disorder as well as assessing the impact that underexplored public health based interventions might have on reducing engagement in street disorder.

Table 2.2 Description of policy approaches

Policy Response	Type of Approach	Description	Public Drug Use	Street Drug Dealing	Sex Work	Pan handling	Binning Vending	Loiter-ing
Police crack-down campaigns*	Law Enforcement	• Temporary sudden increase in policing efforts either in one geographic area or targeted towards one type of offence[63] • Often targeted at open drug markets and involves increasing police patrol and surveillance[105]	X	X	X			X
Order-maintenance policing*	Law Enforcement	• Strict enforcement of any minor bi-law, or misdemeanour offences, with chief objective of reducing more serious crime (informed by 'broken windows theory'[50])	X	X	X	X	X	X
Problem-oriented policing	Law Enforcement	• Police officers partner with community members to jointly prevent crime and address neighbourhood crime issues[135, 139]	X	X	X	X	X	X
Hot-spot policing*	Law Enforcement	• Sub-section of enforcement approaches: involves increasing police patrol and presence in areas with concentrated crime and disorder[91, 97] • Police tactics with hot-spot approaches vary and include order-maintenance policing or crack-down campaigns or other (problem-oriented policing)	X	X	X			X
Increasing police powers through legislation	Law Enforcement	• Increase powers of police to regulate activities in public spaces (prohibits public sleeping, panhandling, loitering), example: 'Safe Streets Act' in British Columbia and Ontario, Canada				X	X	X
Environmental design	Environment-al Design	• Alters built environment to deter undesirable behaviours in public	X	X	X	X	X	X
Supervised injection facilities	Engaging Intervention	• Provides hygienic, sanctioned indoor space to inject illicit drugs	X					X
Addiction treatment	Engaging Intervention	• Aimed at reducing or eliminating illicit drug use • Wide range of approaches including behavioural and pharmacological treatments[160]	X	X	X	X	X	
Low-threshold employment	Engaging Intervention	• Employment programs that do not require employees to be abstinent from drugs		X	X	X	X	

Table 2.3 Evidence of impacts of policy approaches

Policy Response	Observed Impacts	Observed Unintended Negative Impacts
Law Enforcement Based Approaches		
Police crack-down campaigns*	• Reduced drug market activity during operation[63, 107] • Visible reduction only temporary, deterrent effect not lasting[62, 105, 105, 108] • No change in drug prices or frequency of drug use among local IDU[69, 109]	• Displacement[62, 64, 69, 107, 108] • Discourages contact between IDU and health services[107] • Increases violence in area[62, 108, 115] • Associated with police misconduct (unnecessary force, illegal searches)[116] • Discourages safe injecting practices –police searches make IDU reluctance to carry syringes,[63, 64, 107, 116] reduces access to HIV prevention supplies (condoms, syringes),[106, 107] and increased police surveillance leads to rushed injecting which means skipping HIV and overdose prevention steps and other safety measures, as well as[62, 63, 106, 107] discourages safe needle and syringe disposal[62, 64, 107] • Encourages nasal storage, increases risk of accidental overdose and spread of infections[64] • Increases risk of fatal drug overdose as injectors choose more isolated locations[113, 114] • Increases stigma and contributes to inequalities that are determinants of HIV risk[106] • Increases vulnerability to incarceration which is risk environment for HIV[106]
Order-maintenance policing*	• Reductions in visible signs of street disorder[49, 124] • Credited with reductions in homicide and violence crimes[130, 131] but findings are contested[49, 132]	• Displacement[48, 67, 68] • Racial profiling and prejudicial enforcement of laws[127] • Disproportionate incarceration of minority groups[133] • Increases risk of incarceration which is associated with many harms including increasing stigma, risks for HIV acquisition and other health harms[119-125] • Associated with increased civil rights complaints[124]
Problem-oriented policing*	• Moderate reductions in disorder[139, 184] • Evidence-base limited[136, 137, 139]	• No identified unintended consequences

Policy Response	Observed Impacts	Observed Unintended Negative Impacts
Hot-spot policing	• Deterrent effect during hot-spot crack-down campaign[95, 97, 142] • Moderate reductions in disorder after hot-spot crack-down campaign[140, 141] • Moderate reductions in disorder after hot-spot problem-oriented campaign[138, 141]	• No identified unintended consequences associated specifically with hot-spot approach; however, hot-spot approach is paired with other policing approaches (i.e., crack-down campaign) and the unintended consequences of those policing strategies would be relevant
Increasing police powers through legislation	• Reductions in markers of street disorder.[68, 97, 105, 124, 140]	• Associated with civil liberty violations[8, 133]
Environmental Design		
Environmental design*	• No studies specifically evaluating impact on street disorder[145, 146] • Some evidence indicating might reduce some measures of crime in certain situations[83, 146-148]	• Displacement[83, 145, 147] • Disproportionately affects and excludes marginalized populations[83]
Engaging Interventions that Enable Behaviour Change		
Supervised injection facilities	• Associated with reductions in observed and perceived measures of markers of street disorder[101, 104] • No evidence of adverse changes in community drug use patterns,[156] nor increases in initiation into injection drug use,[157] nor increases in drug-related crime[158]	• No identified unintended consequences
Addiction treatment	• Associated with reductions in disorderly income generation[161-165] • Among high intensity drug users treatment success is typically periodic and followed by periods of relapse back into drug use[166-169]	• No identified unintended consequences
Low-threshold employment	• Associated with reductions in engagement in some disorderly income generation activities[175] • Evaluation studies of low-threshold employment program limited	• No identified unintended consequences

*Note: The outcomes of interest for many of the studies evaluating the impact of these interventions were crime rates not street disorder.

CHAPTER 3:

A DOSE-DEPENDENT RELATIONSHIP BETWEEN EXPOSURE TO A STREET-BASED DRUG SCENE AND HEALTH-RELATED HARMS AMONG PEOPLE WHO USE INJECTION DRUGS[2]

3.1 Introduction

In many urban areas globally, street disorder related to the use and trade of illicit drugs is a growing public policy concern.[25, 40, 42, 50, 89-91] Common signs of drug-related street disorder include the consumption of illegal drugs in public areas and public intoxication (i.e., loitering or socializing in public spaces while under the influence of drugs).[1-6] In addition, activities including street-level drug dealing, street-based sex work, panhandling, and engaging in 'binning', recycling, salvaging and unsanctioned street-vending are examples of everyday income generation strategies used by many street-based drug users which further contribute to street disorder.[2, 3, 8-10] The physical locations where these disorderly activities are highly concentrated are often referred to as 'drug scenes' and are widely recognized and well described in many urban areas, including Vancouver, Canada, where a large open drug scene has persisted for decades.[185-189]

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[2] A version of this chapter has been submitted for publication. DeBeck, K., Wood, E., Zhang, R., Buxton, J., Montaner, J., Kerr, T. A dose-dependent relationship between exposure to a street-based drug scene and health-related harms among people who use injection drugs.

To date, the harmful impacts of drug-related street disorder are most frequently discussed in reference to their negative effects on surrounding communities.[25, 40] It has been reported that when questioned, a high proportion of urban citizens rank street disorder as a top concern in their community, often above very serious crimes including homicide, sexual assault and robbery.[25, 40, 42, 50, 89-91] Indeed, the atmosphere of street-level drug dealing can be intimidating for the general public and may discourage the use of public spaces in the vicinity of street-based drug scenes.[48, 49, 143] High levels of street disorder have also been linked to depressed retail activity and economic investment in surrounding areas.[8, 40-45]

While the community impacts of drug-related street disorder are generally well understood, lesser attention has been given to the potential health and social impacts that exposure to and immersion in street-based drug scenes has on street-involved people who use illicit drugs.[190] Existing public health research has documented a wide range of health risks associated with engaging in specific disorderly activities, such as street-based sex work,[57, 58, 191] the use of injection drugs in public areas,[3, 61, 83] and street-level drug dealing;[4, 192] however, these studies focused on specific behaviours and did not consider the role that exposure to drug scenes itself may play in shaping health behaviours and outcomes.

To address this gap and provide improved understandings of the impacts of drug-related street disorder, we sought to assess whether exposure to drug-related

street disorder, in the form of Vancouver's well-described street-based drug scene, was associated with markers of vulnerability to harm and adverse health outcomes such as unstable housing, high intensity drug use, exposure to violence, and encounters with law enforcement. We also sought to determine whether the level of drug scene exposure was associated with varying degrees of vulnerability to harm and adverse health outcomes. It was hoped that these findings would inform more effective policy interventions to address drug-related street disorder.

3.2 Methods

Data for this study were obtained from the Vancouver Injection Drug Users Study (VIDUS). For a full description of the study please refer to section 1.4 of this thesis. The present study is restricted to VIDUS participants seen for study follow-up during the period of December 2005 to March 2009, as the measure for our outcome of interest was available only for this period.

The primary outcome of interest for this analysis was 'drug scene exposure', broadly defined as spending time on the street in Vancouver's drug use epicenter, which is a well-described and defined area of the city referred to as the 'Downtown Eastside'.[14, 193] Our measure for this variable was based on responses to the question: "On average, how many hours a day do you spend on the street?" To capture exposure to drug scenes and not general exposure to city streets we limited our measure of drug scene exposure to participants that resided in or frequently visited (daily or 2-3 times a

week) Vancouver's drug use epicenter. Because we were interested in assessing whether the level of drug scene exposure was associated with differing levels of risk behaviour and harm, we created four categories of drug scene exposure. We defined our reference category of 'no exposure' to include all individuals who did not reside in or frequently visit Vancouver's drug use epicenter, as well as individuals who reported spending no more than an average of 1 hour or less on the street each day over the last six months. After examining the distribution of one small cross-sectional sample of reports of the number of hours spent on the street, we divided the responses into three groups of similar size. These are referred to as the 'low', 'moderate', and 'high' exposure groups, which included individuals that resided in or frequently visited Vancouver's drug use epicenter and spent on average between 2-6, 7-15, and more than 15 hours on the street each day over the last six months, respectively.

Explanatory variables of interest included socio-demographic information: gender (female vs. male), age (per year older), Aboriginal ancestry (yes vs. no) and unstable housing, defined as living in a single occupancy room in hotel, a treatment or recovery house, jail, shelter or hostel, or having no fixed address for the last six months (yes vs. no). Drug use and risk behaviour variables considered refer to behaviours in the past six months and included: daily cocaine injection (yes vs. no), daily heroin injection (yes vs. no), daily crack cocaine smoking (yes vs. no), non-fatal overdose (yes vs. no), and syringe sharing defined as borrowing or lending syringes already used by someone else to inject drugs (yes vs. no). Other factors considered included: encounters with

police in the last month, defined as being questioned, searched or stopped by police (yes vs. no), being a victim of violence, defined as being physically assaulted (yes vs. no), having multiple sex partners (yes vs. no), engaging in any unprotected sex (yes vs. no), having regular employment, defined as having a regular or temporary job (yes vs. no), sex trade involvement, defined as exchanging sex for money, shelter, drugs or other commodities (yes vs. no), participation in drug dealing (yes vs. no), and participation in any addiction treatment program, defined as reporting being enrolled in methadone treatment, a detoxification program, a recovery house, a residential addiction treatment centre or engaging with an addictions counselor or participating in peer support programs such as Narcotics Anonymous (yes vs. no). Unless otherwise stated, all behavioural variables refer to the previous six months. To account for a potential seasonal influence on the amount of time individuals spend on the street, we also included a categorical variable representing the month that participants completed our study. This helped ensure that our analysis adjusted for seasonal variations in responses.

To identify factors associated with drug scene exposure and consider whether the level of exposure was associated with varying degrees of vulnerability to harm and adverse health outcomes, we constructed three separate regression models. All models used the 'no exposure' category as the reference category. The first model considered the 'low exposure' category, the second model considered the 'moderate exposure'

category and the third model considered the 'high exposure' category as the exposure of interest.

Since analyses of factors potentially associated with our outcomes of interest included serial measures for each subject, we used generalized estimating equations (GEE) for binary outcomes with logit link for the analysis of correlated data to determine factors associated with each level of drug scene exposure throughout the 40-month follow-up period.[194] These methods provided standard errors adjusted by multiple observations per person using an exchangeable correlation structure. Therefore, data from every participant follow-up visit were considered in these analyses and we were able to accommodate changes in categories over time. Missing data were addressed through the GEE estimating mechanism which uses all available pairs method. All non-missing pairs of data are used in the estimators of the working correlation parameters.

As a first step, GEE univariate analyses were conducted to obtain unadjusted odds ratios and 95% confidence intervals for variables of interest and each level of drug scene exposure. In order to adjust for potential confounding, all variables that were associated with the dependent variable at $p < 0.05$ in GEE univariate analyses were entered in each multivariate logistic GEE model. Although all multivariate models were run independently, all variables that reached significance at any level of drug scene exposure in univariate analyses were included in each multivariate model. This was to

ensure that all three models adjusted for the same variables allowing for comparisons between multivariate models. All statistical analyses were performed using SAS software version 9.1 (SAS, Cary, NC). All p-values are two sided.

3.3 Results

During the study period a total of 1,486 participants completed follow-up visits, including 527 (35%) women and 497 (33%) persons who identified as being of Aboriginal ancestry. The median age of participants at baseline was 42 years (interquartile range [IQR] = 35-48). This sample contributed 3,994 observations: 1,237 observations fit the criteria for no exposure, 1,121 observations fit the criteria for low exposure, 779 observations fit the criteria for moderate exposure and 757 observations fit the criteria for high drug scene exposure. The median number of follow-up visits was 3 (IQR= 2-4), and 1157 (77.9%) participants completed at least two study visits. The baseline characteristics of the study sample stratified by level of drug scene exposure are presented in Table 3.1. In this baseline table, characteristics for individuals fitting the criteria for either low, moderate or high drug scene exposure were measured at their first visit (during the study period, Dec 2005 –March 2009) which involved a report of low, moderate or high drug scene exposure. Characteristics for participants in the 'no exposure' category were measured from the first study visit during the study period.

The univariate GEE analyses of behavioural and socio-demographic variables are presented in Table 3.2, and the multivariate GEE analyses are shown in Table 3.3. Figure

3.1 shows a selection of behavioural and drug use factors associated with each of the three levels of drug scene exposure (note: unstable housing was not included in the figure due to the large scale difference in AOR). In multivariate analyses, unstable housing was significantly associated with all levels of drug scene exposure and the strength of the association increased from low (adjusted odds ratio [AOR] = 3.10, CI: 2.52–3.80) to moderate (AOR = 3.73, CI: 2.92–4.77) to high exposure (AOR = 9.50, CI: 6.36–14.20). Similarly, the associations between drug scene exposure and drug use practices increased with level of exposure. Daily crack cocaine use was significantly associated with all levels of drug scene exposure and this association increased from low (AOR =1.49, CI: 1.20-1.85) to moderate (AOR =1.90, CI: 1.50-2.40) to high exposure (AOR =2.70, CI: 2.07-3.52). Daily heroin injection was not significantly associated with low drug scene exposure (AOR =0.82, CI: 0.63-1.08), but became significantly associated with moderate exposure (AOR =1.43, CI: 1.07-1.91), and the strength of association increased with high exposure (AOR =1.84, CI: 1.37-2.47). Daily cocaine injection was not significantly associated with low (AOR =0.87, CI: 0.60-1.26) or moderate drug scene exposure (AOR =1.09, CI: 0.72-1.64) but became significant with high exposure (AOR = 1.73, CI: 1.15-2.61). Likewise, being a victim of violence, having encounters with police, and involvement in drug dealing were not associated with low drug scene exposure but became significant for both moderate and high exposure (see Table 3.3). Aboriginal ancestry also was not significantly associated with low drug scene exposure but became significant with both moderate and high exposure. Regular employment was

significantly negatively associated with all levels of drug scene exposure. Although addiction treatment was not significantly associated with low drug scene exposure, it became significantly negatively associated with moderate and high exposure.

3.4 Discussion

In this study we found that drug scene exposure was associated in a dose-dependent fashion with multiple markers of vulnerability to harm and adverse health outcomes, including being unstably housed, being a victim of violence, having encounters with police and participating in drug dealing. Drug scene exposure was also associated with higher intensity drug use. Individuals who reported high levels of drug scene exposure were significantly more likely to inject cocaine and heroin on a daily basis, and daily crack cocaine smoking was significantly associated with all levels of drug scene exposure. These associations, in most instances, also increased in a dose-dependent fashion with greater exposure to drug scenes. The dose-dependent effect was particularly strong for unstable housing, intensity of drug use and encounters with police. Our analysis further found that employment and addiction treatment were associated with decreased drug scene exposure.

Our finding that people with greater levels of drug scene exposure were more likely to be higher intensity drug users and have multiple markers of vulnerability is consistent with a broader literature highlighting the relationship between structural environmental factors (i.e., drug use settings and the laws and policies regulating drug

use) and health behaviours and outcomes.[71, 73, 75-78, 78, 79, 84, 190, 195-197] However, previous work looking at the impact of drugs scenes has historically focused on involvement in drug scenes in the context of specific behaviours such as income generation acts,[4, 7, 10, 57-59] public injecting[61-65] and drug scene roles.[186] Our study is unique in that it considers exposure to drug scenes independent of engagement in specific activities.

A key implication of our findings is that the negative impacts of street-based drug scenes are not felt only by surrounding communities and the general public. Rather, street-based drug scenes have significant negative health and social implications for people who are exposed to them, and these negative effects appear to increase with greater levels of drug scene exposure. This suggests that efforts to reduce street disorder have potential to benefit people who are engaged in drug scenes, as well as the broader community.

It is important to recognize that, to date, interventions to address drug-related street disorder have largely relied on law enforcement based approaches that have been shown to be limited in their ability to meaningfully address street disorder.[62, 63, 69, 106, 110, 198-200] Furthermore, many law enforcement based strategies have also been linked with negative individual and community outcomes.[59, 59, 107, 111, 133] Innovative solutions that both reduce drug-related street disorder and protect the health of people who are engaged in drug scenes are therefore required.

In the current analysis, the relationship between employment and reduced drug scene exposure is consistent with previous research demonstrating the positive influence of employment on social integration and health outcomes[172, 201-203] and suggests that interventions in this area may help to address street disorder and drug scene exposure. However, existing employment programs for people who use drugs are often linked with addiction treatment objectives and intended to engage participants in regular steady employment and abstinence from illicit drug use.[172, 204] These programmatic conditions and goals are not suitable or realistic for many street entrenched drug users.[170, 175] Alternatively, low-threshold employment programs that do not require abstinence from drug use may provide important benefits for IDU, including a reduction in exposure to street-based drug scenes.[175, 205, 206] The potential relationship between street disorder and low-threshold employment is an area that should be considered for future study.

Our findings related to unstable housing provide additional direction for the development of policy options that might help to address exposure to street disorder. Specifically, providing stable housing to homeless people who use drugs is one promising approach to decrease street disorder and exposure to drug scenes. However, it is notable that in addition to outright homelessness our definition of unstable housing included living in single room occupancy hotels as well as treatment and recovery homes, suggesting that it is not just people who are homeless who are generating street disorder. For instance, space constraints and regulatory policies within single room

occupancy hotels and recovery houses (i.e., guest fees, and bans on substance use and/or intoxication on the premises) may deter drug users from spending time in their place of residence and thereby contribute to street disorder.[207] Further examination of the role that space constraints and restrictive regulatory policies may play in encouraging exposure to drug scenes would be beneficial.

Finally, our finding that those more involved in the local drug scene were less likely to be receiving addiction treatment suggests that efforts to encourage access and engagement in addiction treatment may further help to reduce street disorder. Innovative addiction treatment methods may be required as the long-term drug use patterns of IDU suggest that current treatment modalities have limited success in sustaining injection cessation among a large proportion of established injection drug users.[166] Furthermore, the rapid increase in crack cocaine use in our study setting and elsewhere suggests that addiction treatment for stimulant users is an emerging priority. In the Vancouver setting, our analysis also suggests that to be effective, interventions must be culturally sensitive and appropriate for Aboriginal people who use drugs. This will likely require tailoring interventions with the direct input of drug users who identify as being of Aboriginal ancestry.

There are a number of limitations in our study. Firstly, our study sample was community recruited and not a random sample of people who inject drugs. It is, however, believed to be reflective of the population of injection drug users in the

community.[208] Secondly, although the current study shows that drug scene exposure is associated with multiple risk factors for negative health outcomes, the nature of our observational study can not untangle whether these relationships are revealing antecedent causes, or consequences of exposure to drug scenes. With respect to antecedent causes, the relationship between housing and drug scene exposure is consistent with a well established literature demonstrating that housing is a key influence on health status among drug using populations.[183, 209-211] In our study context, unstable housing conditions (which included outright homelessness) may lead to exposure to and immersion in open drug scenes. However, individuals who are stably housed may become involved in open drug scenes through other mechanisms and this immersion may have a destabilizing influence that could lead to deterioration in housing status. Similarly, our analyses can not determine whether the elevated intensity of drug use that coincides with exposure is because high intensity drug use predisposes individuals to become immersed in open drug scenes, or if exposure to drug scenes leads to heightened drug use. However, despite uncertainty regarding the causal direction of the observed relationships, it remains clear that exposure to street-based drug scenes is associated with public health harms. Another limitation of our study is that several of our measures are based on self-reporting and are therefore vulnerable to socially desirable responding and recall bias. In the current study socially desirable responding may have led to an underestimation of risk behaviour and exposure to drug scenes suggesting that our estimates are conservative. Although recall issues are

particularly relevant to our measures for exposure to street disorder, we have no reason to suspect this would systematically differ among exposures of interest. Therefore, if recall issues are present we would suspect this would bias our results towards the null.

In summary, increased exposure to street-based drug scenes is associated with increased vulnerability and intensity of addiction, suggesting that both individual drug users and surrounding communities are negatively impacted by street disorder. This suggests that reducing street disorder and exposure to it can have a wide range of public health and community benefits. These findings highlight important opportunities for policy interventions to address exposure to street disorder in the areas of employment, housing and addiction treatment.

Table 3.1 Baseline characteristics of sample stratified by level of drug scene exposure [n = 1486]

Characteristic [b]	Level of drug scene exposure [a]			
	No Exposure *n*= 490, *n* (%)	**Low Exposure** *n*= 405, *n* (%)	**Moderate Expo.** *n*= 277, *n* (%)	**High Exposure** *n*= 314, *n* (%)
Median age (IQR)	43 (36-49)	43 (38-49)	42 (35-48)	38 (31-44)
Female Gender	183 (37)	136 (34)	91 (33)	117 (37)
Aboriginal Ancestry	139 (28)	129 (32)	98 (35)	131 (42)
Unstable Housing [c]	219 (45)	325 (80)	237 (86)	302 (96)
Daily Cocaine Inject [c]	36 (7)	28 (7)	29 (10)	53 (17)
Daily Heroin Inject [c]	79 (16)	70 (17)	88 (32)	149 (47)
Daily Crack Use [c]	119 (24)	146 (36)	152 (55)	212 (68)
Overdose (non-fatal) [c]	25 (5)	16 (4)	21 (8)	31 (10)
Syringe Sharing [c]	46 (9)	24 (6)	17 (6)	33 (11)
Encounters w/ Police [d]	80 (16)	92 (23)	106 (38)	144 (46)
Victim of Violence [c]	58 (12)	83 (20)	79 (29)	93 (30)
Multiple Sex Partner [c]	64 (13)	69 (17)	64 (23)	75 (24)
Unprotected Sex [c]	161 (33)	123 (30)	89 (32)	87 (28)
Reg Employment [c]	175 (36)	88 (22)	62 (22)	45 (14)
Sex Work [c]	38 (8)	59 (15)	48 (17)	58 (18)
Drug Dealing [c]	90 (18)	98 (24)	112 (40)	169 (54)
In Treatment [c]	277 (57)	222 (55)	115 (42)	120 (38)

Notes: [a] Levels of drug scene exposure were defined based on the average number of hours participants reported spending on the street each day in Vancouver's drug use epicenter in the previous six months: "no drug scene exposure" included reports of 1 hour or less; "low exposure" included reports of 2-6 hours; "moderate exposure" included reports of 7-15 hours; and "high exposure" included reports of more than 15 hours. [b]Characteristics for individuals in the low, moderate and high drug scene exposure categories were measured at their first visit (during the study period, Dec 2005 –March 2009) which involved a report of drug scene exposure. Characteristics for participants in the 'no exposure' category were measured from the first study visit during the study period; [c] Denotes activities or situations referring to previous 6 months; [d] Denotes activities or situations referring to previous month.

Table 3.2 Univariate analyses of factors associated with drug scene exposure*

Characteristic	GEE[a] for Low vs. No Exposure		GEE for Moderate vs. No Exposure		GEE for High vs. No Exposure	
	OR (95% CI) [b]	*p-value*	OR (95% CI)	*p-value*	OR (95% CI)	*p-value*
Older Age Per year older	1.00 (0.99 - 1.02)	0.457	**0.99 (0.97 - 1.00)**	0.017	**0.95 (0.93 - 0.96)**	**<.001**
Gender Female vs. Male	0.87 (0.71 - 1.07)	0.183	0.95 (0.76 - 1.19)	0.659	1.03 (0.81 - 1.30)	0.836
Aboriginal Ancestry Yes vs. No	1.11 (0.90 - 1.36)	0.330	**1.34 (1.06 - 1.68)**	**0.013**	**1.52 (1.19 - 1.93)**	**<.001**
Unstable Housing [c] Yes vs. No	**3.29 (2.71 - 4.01)**	**<.001**	**4.22 (3.36 - 5.31)**	**<.001**	**11.25 (7.97-15.88)**	**<.001**
Daily Cocaine Inject [c] Yes vs. No	1.07 (0.76 - 1.51)	0.680	1.37 (0.99 - 1.91)	0.060	**1.95 (1.46 - 2.59)**	**<.001**
Daily Heroin Inject [c] Yes vs. No	0.99 (0.78 - 1.27)	0.963	**2.19 (1.71 - 2.80)**	**<.001**	**3.09 (2.45 - 3.89)**	**<.001**
Daily Crack Use [c] Yes vs. No	**1.87 (1.53 - 2.27)**	**<.001**	**2.71 (2.20 - 3.33)**	**<.001**	**4.09 (3.32 - 5.04)**	**<.001**
Overdose (non-fatal) [c] Yes vs. No	0.74 (0.49 - 1.12)	0.152	1.32 (0.94 - 1.87)	0.108	**1.38 (1.04 - 1.84)**	**0.026**
Syringe Sharing [c] Yes vs. No	0.96 (0.68 - 1.33)	0.788	1.19 (0.84 - 1.68)	0.318	1.16 (0.86 - 1.56)	0.331
Encounters with Police [d] Yes vs. No	**1.36 (1.10 - 1.69)**	**0.004**	**2.01 (1.63 - 2.48)**	**<.001**	**2.30 (1.88 - 2.82)**	**<.001**
Victim of Violence [c] Yes vs. No	1.22 (0.97 - 1.53)	0.092	**1.76 (1.45 - 2.13)**	**<.001**	**1.70 (1.42 - 2.02)**	**<.001**
Multiple Sex Partners [c] Yes vs. No	1.09 (0.86 - 1.38)	0.477	**1.34 (1.05 - 1.72)**	**0.019**	**1.44 (1.17 - 1.78)**	**<.001**
Unprotected Sex [c] Yes vs. No	0.88 (0.73 - 1.06)	0.176	0.92 (0.76 - 1.12)	0.420	0.92 (0.76 - 1.10)	0.347
Regular Employment [c] Yes vs. No	**0.67 (0.55 - 0.81)**	**<.001**	**0.61 (0.50 - 0.75)**	**<.001**	**0.47 (0.39 - 0.57)**	**<.001**
Sex Work [c] Yes vs. No	**1.70 (1.29 - 2.23)**	**<.001**	**1.99 (1.50 - 2.65)**	**<.001**	**2.09 (1.56 - 2.79)**	**<.001**
Drug Dealing [c] Yes vs. No	**1.37 (1.12 - 1.67)**	**0.002**	**2.06 (1.66 - 2.55)**	**<.001**	**2.91 (2.40 - 3.55)**	**<.001**
Addiction Treatment [c] Yes vs. No	1.10 (0.92 - 1.30)	0.293	**0.75 (0.63 - 0.91)**	**0.003**	**0.68 (0.56 - 0.82)**	**<.001**

Note: [a]GEE = Generalized Estimating Equation; [b]OR = Odds Ratio; CI = Confidence Interval; [c] Denotes activities or situations referring to previous 6 months; [d] Denotes activities or situations referring to previous month.*Levels of drug scene exposure were defined based on the number of hours participants reported spending on average on the street each day in Vancouver's drug use epicenter in the previous six months: "no drug scene exposure" included reports of 1 hour or less; "low exposure" included reports of 2-6 hours; "moderate exposure" included reports of 7-15 hours; and "high exposure" included reports of more than 15 hours.

Table 3.3 Multivariate analyses of factors associated with drug scene exposure*

Characteristic	GEE for Low vs. No Exposure		GEE for Moderate vs. No Exposure		GEE for High vs. No Exposure	
	AOR (95% CI) [b]	*p-value*	AOR (95% CI)	*p-value*	AOR (95% CI)	*p-value*
Older Age Per year older	1.01 (1.00 - 1.02)	0.071	1.00 (0.99 - 1.02)	0.684	**0.97 (0.96 - 0.99)**	**<.001**
Aboriginal Ancestry Yes vs. No	1.19 (0.96 - 1.48)	0.105	**1.52 (1.18 - 1.95)**	**0.001**	**1.74 (1.30 - 2.34)**	**<.001**
Unstable Housing [c] Yes vs. No	**3.10 (2.52 - 3.80)**	**<.001**	**3.73 (2.92 - 4.77)**	**<.001**	**9.50 (6.36 - 14.20)**	**<.001**
Daily Cocaine Inject [c] Yes vs. No	0.87 (0.60 - 1.26)	0.461	1.09 (0.72 - 1.64)	0.680	**1.73 (1.15 - 2.61)**	**0.009**
Daily Heroin Inject [c] Yes vs. No	0.82 (0.63 - 1.08)	0.154	**1.43 (1.07 - 1.91)**	**0.014**	**1.84 (1.37 - 2.47)**	**<.001**
Daily Crack Use [c] Yes vs. No	**1.49 (1.20 - 1.85)**	**<.001**	**1.90 (1.50 - 2.40)**	**<.001**	**2.70 (2.07 - 3.52)**	**<.001**
Overdose (non-fatal) [c] Yes vs. No	**0.62 (0.40 - 0.96)**	**0.031**	0.94 (0.62 - 1.44)	0.783	0.85 (0.57 - 1.25)	0.400
Encounters with Police [d] Yes vs. No	1.25 (0.99 - 1.57)	0.061	**1.63 (1.28 - 2.08)**	**<.001**	**2.11 (1.62 - 2.75)**	**<.001**
Victim of Violence [c] Yes vs. No	1.12 (0.88 - 1.44)	0.365	**1.50 (1.19 - 1.89)**	**<.001**	**1.49 (1.14 - 1.95)**	**0.003**
Multiple Sex Partners [c] Yes vs. No	1.05 (0.82 - 1.36)	0.693	1.11 (0.83 - 1.49)	0.489	1.17 (0.85 - 1.61)	0.341
Regular Employment [c] Yes vs. No	**0.77 (0.63 - 0.94)**	**0.010**	**0.75 (0.60 - 0.95)**	**0.015**	**0.50 (0.38 - 0.65)**	**<.001**
Sex Work [c] Yes vs. No	**1.44 (1.08 - 1.92)**	**0.013**	**1.63 (1.20 - 2.21)**	**0.002**	1.28 (0.88 - 1.86)	0.202
Drug Dealing [c] Yes vs. No	1.05 (0.84 - 1.33)	0.655	**1.35 (1.05 - 1.73)**	**0.019**	**1.46 (1.14 - 1.87)**	**0.003**
Addiction Treatment [c] Yes vs. No	1.04 (0.86 - 1.25)	0.688	**0.69 (0.56 - 0.85)**	**<.001**	**0.58 (0.45 - 0.75)**	**<.001**

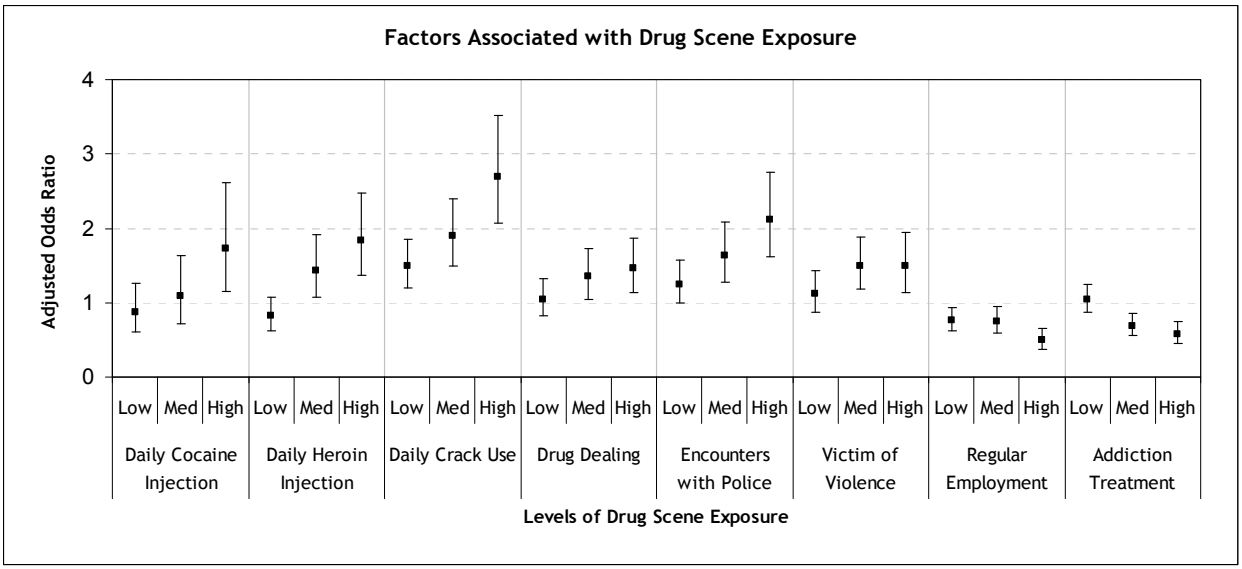
Note: [a]GEE = Generalized Estimating Equation; [b]AOR = Adjusted Odds Ratio; CI = Confidence Interval; [c] Denotes activities or situations referring to previous 6 months; [d] Denotes activities or situations referring to previous month.

*Levels of drug scene exposure were defined based on the number of hours participants reported spending on average on the street each day in Vancouver's drug use epicenter in the previous six months: "no drug scene exposure" included reports of 1 hour or less; "low exposure" included reports of 2-6 hours; "moderate exposure" included reports of 7-15 hours; and "high exposure" included reports of more than 15 hours.

**The 'no exposure' category included 1,237 observations, the 'low exposure' category included 1,121 observations, the 'moderate exposure' category included 779 observations, and the 'high exposure' category included 757 observations.

***All models were adjusted for the month each interview was conducted.

Figure 3.1 Factors associated with drug scene exposure



*Levels of drug scene exposure were defined based on the number of hours participants reported spending on average on the street each day in Vancouver's drug use epicentre in the previous six months. All above estimates used the reference category of "no drug scene exposure" defined as spending 1 hour or less in Vancouver's drug scene. "Low exposure" included reports of 2-6 hours; "moderate exposure" included reports of 7-15 hours; and "high exposure" included reports of more than 15 hours.

**All models were adjusted for and included the following variables: age, Aboriginal ancestry, unstable housing, daily cocaine injection, daily heroin injection, daily crack cocaine use, drug overdose, encounters with police, victim of violence, multiple sex partners, regular employment, sex work, drug dealing, addiction treatment, and month interview was conducted.

CHAPTER 4:

THE VALIDITY OF REPORTING WILLINGNESS TO USE A SUPERVISED INJECTING FACILITY ON SUBSEQUENT PROGRAM USE AMONG PEOPLE WHO USE INJECTION DRUGS[3]

4.1 Introduction

Illicit drug use continues to be associated with a broad range of health and social harms and there is growing recognition that innovative interventions are needed to address problems in this area, including drug-related street disorder.[197, 212-214] However, illicit drug use, and particularly injection drug use, is highly stigmatized,[215-217] and it can be difficult to determine if a proposed intervention will be accepted by drug using communities.[218-221]

One strategy that has been employed to assess the level of acceptance of innovative health programs, such as supervised injection facilities (SIF) where injection drug users can bring pre-obtained illicit drugs and inject under the supervision of a nurse, has been to survey the target population and measure their willingness to use the proposed service.[222-224] Although this approach has been used to determine acceptance of safer supervised injection facilities in several settings including Vancouver, Montreal, San Francisco, London, Ireland, Melbourne and Sydney,[193, 222, 225-230] the validity of these

[3] A version of this chapter has been submitted for publication as: DeBeck, K., Kerr, T., Lai, C., Buxton, J., Montaner, J., Wood, E. The validity of reporting willingness to use a supervised injecting facility on subsequent program use among people use who use injection drugs.

surveys has not been fully evaluated. To assess whether willingness measures may be effective tools for planning the delivery of public health programs for injection drug user populations and help determine the feasibility of innovative interventions to address drug-related street disorder, we sought to determine whether measures of willingness collected prior to the opening of a Canadian SIF accurately predicted later use of the program.

4.2 Methods

Data for this study were obtained from the Vancouver Injection Drug Users Study (VIDUS). For a full description of the study please refer to section 1.4 of this thesis. In the primary analysis, we assessed whether reports of willingness to use a SIF before the program opened were associated with subsequent self-reported attendance at the facility after it was established in the Downtown Eastside (DTES) of Vancouver in September 2003. Initial willingness measures were assessed during the pre-SIF period of December 2001 – May 2003 based on the question: "If a supervised safe injection site was available, would you use it?" 'Yes' responses were compared to 'No' responses, and individuals who replied that they were 'Unsure' were assessed in sub-analyses. Attendance at the facility was measured during the post-SIF period of December 2003 – November 2005 based on the question: "Have you ever used the InSite SIS?"

Our primary analysis sought to determine whether there was a significant relationship between our main dependent variable of interest (attendance at the SIF)

and our primary independent variable (prior report of willingness to attend a SIF). To consider this association while evaluating potential confounders, we *a priori* selected a range of secondary explanatory independent variables hypothesized to be associated with both attendance and initial willingness to attend based on previous research.[193, 222, 231] Secondary explanatory factors included: age (younger than 39 yrs of age vs. older); gender (female vs. male); unstable housing, defined as living in a single occupancy room in a hotel, a treatment or recovery house, jail, shelter or hostel, or having no fixed address for the last six months, (yes vs. no); frequent exposure to the Downtown Eastside (DTES), which is Vancouver's well described drug use epicentre and where the Vancouver SIF is situated,[193] was defined as residing in or visiting the DTES at least 2-3 times per week (yes vs. no); daily cocaine injection (yes vs. no); daily heroin injection (yes vs. no); daily crack cocaine smoking (yes vs. no); non-fatal overdose (yes vs. no); and using injection drugs in public locations, such as city streets, parks and alleys (yes vs. no). All drug use and behavioural variables refer to the previous six month period and were measured at participants' first study visit during our study period.

As a first step, we compared baseline characteristics stratified by attendance at the Vancouver SIF. We used Pearson's Chi-Square test for dichotomous variables and the Mann-Whitney test for continuous variables. We were primarily concerned with identifying whether there was an independent relationship between just two variables (attendance at the SIF and prior report of willingness to attend a SIF). To address this, we used a backwards selection process with automated procedures, previously

described by Maldonado and Greenland[232] and Rothman and Greenland,[233] which is specific to fitting multivariate models in these instances. Specifically, we began by including all variables in a fixed model. We subsequently generated a series of confounding models by removing secondary variables one at a time. For each of these models, we assessed the relative change in the coefficient for our primary independent variable of interest (prior willingness to use a SIF). The secondary variable that resulted in the smallest absolute relative change in the coefficient of 'prior willingness to use a SIF' was then removed. This approach allowed us to identify the secondary variables that had the strongest influence on the coefficient for our primary variable of interest. Using this automated procedure, secondary variables continued to be removed until the smallest relative change in the coefficient of 'prior willingness to use a SIF' exceeded 5% of the value of the coefficient. The final model included prior willingness to use a SIF and all remaining secondary explanatory variables.

To further explore the relationship between initial willingness and later use of a SIF, we conducted a number of sub-analyses. First, among individuals who reported that they had not attended the SIF, we assessed rates of non-injection drug use in the past six months during the post-SIF period, as well as infrequent exposure to the neighbourhood where the supervised injection site was located. Infrequent exposure was defined as not residing in the Downtown Eastside and visiting the neighbourhood less than monthly. We then sought to identify factors associated with not attending the SIF among participants who initially reported a willingness to use the facility. Factors

that we hypothesized might be associated with not attending the Vancouver SIF included: age (younger than 39 yrs of age vs. older), gender (female vs. male); infrequent exposure to the DTES (yes vs. no); infrequent cocaine injection (< daily vs. ≥ daily); and infrequent heroin injection (< daily vs. ≥ daily); being recently incarcerated (yes vs. no) and recently being involved in any kind of addiction treatment program (yes vs. no). All variables, including our outcome of interest, refer to behaviours in the previous six months.

Since for this analysis we were interested in identifying multiple factors that might be associated with not using the SIF, we did not use the previous model building protocol which is designed to adjust for confounding and determine whether there is an independent relationship between just two factors of interest. Another distinguishing feature of this sub-analysis was that it focused on the post-SIF follow-up period of 24 months, and we had multiple observations per person for factors potentially associated with not using the SIF as well as serial measures for each subject. Therefore, to determine factors associated with our outcome of interest throughout the entire 24-month follow-up period we used generalized estimating equations (GEE) for binary outcomes with logit link for the analysis of correlated data.[194] These methods provided standard errors adjusted by multiple observations per person using an exchangeable correlation structure. With this approach data from every participant follow-up visit were considered in this analysis. Missing data were addressed through the GEE

estimating mechanism which uses the all available pairs method. All non-missing pairs of data are used in the estimators of the working correlation parameters.

As a first step, GEE univariate analyses were conducted to obtain unadjusted odds ratios and 95% confidence intervals for variables of interest. In order to adjust for potential confounding, all variables that were $p < 0.05$ in GEE univariate analyses were entered into a multivariate logistic GEE model. All statistical analyses were performed using SAS software version 9.1 (SAS, Cary, NC). All p-values are two sided.

4.3 Results

A total of 640 individuals were seen for study follow-up during the pre-SIF study period (see Figure 4.1.). In the pre-SIF period 344 (54%) participants reported being willing to use a SIF, 256 reported being unwilling (40%) and 40 (6%) were unsure. Among the 'unsure' group 11 (28%) were not seen for study follow-up during the post-SIF study period, and of the remaining 29 'unsure' individuals, 18 (62%) subsequently used the facility. Among the 600 participants who reported either being willing or unwilling to use a SIF, 158 (70 and 88 respectively) were not seen for study follow-up during the post-SIF study period and were therefore excluded from further analyses. Those lost to follow-up were significantly less likely to report being willing to use a SIF ($p < 0.001$). The remaining 442 participants were included in our primary comparison of those that reported yes vs. no willingness. Among the 274 participants within this group who reported being initially willing to use a SIF, 198 (72%) later reported

attending the SIF, while 91 (54%) of those who were initially unwilling reported later attending the SIF. The characteristics of the study sample stratified by reported attendance at the SIF are presented in Table 4.1. The univariate analyses of behavioural and socio-demographic variables are also presented in Table 4.1. Initial willingness to use a SIF was significantly associated with later use of the facility (odds ratio [OR] = 2.20, 95% confidence interval [CI] 1.47-3.30). The results of the final multivariate logistic regression are shown in Table 4.2. Our primary explanatory variable, initial willingness to use a SIF, remained independently associated with attending the SIF (Adjusted Odds Ratio [AOR] =1.67, 95% CI: 1.09-2.55). Unstable housing (AOR = 1.54, 95% CI 1.01-2.34) and using injection drugs in public were also independently associated with using the SIF (AOR = 2.35, 95% CI 1.46-3.77).

In sub-analyses, we found that among participants who did not attend the SIF, 31 (19%) reported at some point during the post-SIF study period that they had not injected drugs in the previous six month. Similarly, during the same period and among the same group, 32 (21%) individuals reported infrequent exposure to the DTES.

In the sub-analysis restricted to the 274 individuals who initially reporting being willing to use a SIF (see Table 4.3), being younger than 39 years of age, infrequent exposure to the DTES, infrequent cocaine injection, infrequent heroin injection and engagement in any addiction treatment program were significantly associated with not using the SIF in univariate GEE analyses. In multivariate GEE analyses, infrequent

exposure to the DTES (AOR = 1.89, 95% CI: 1.31-2.71), infrequent cocaine injection (AOR = 1.54, 95% CI: 1.13-2.09), and infrequent heroin injection (AOR = 2.37, 95% CI: 1.77-3.17) were significantly positively associated with not using the SIF, while being younger than 39 years of age (AOR = 0.03, 95% CI: 0.01-0.05) was significantly negatively associated with not using the SIF.

4.4 Discussion

Our study found that initial willingness to use a SIF was independently associated with subsequent attendance at Vancouver's SIF, even after adjusting for other determinants of willingness. We also found that not actively injecting drugs, as well as infrequent exposure to the neighbourhood where Vancouver's SIF is located, were factors that appear to negatively influence whether individuals use a SIF following a report of being willing to use the program before it opened.

These findings are largely consistent with a broad literature suggesting that behavioural intention is a reasonable predictor of later action.[234, 235] Indeed, intention measures have been found to be correlated with health-related behaviours in a number of areas including adolescent smoking, illicit drug use, and sexual health.[236-241] Although behavioural willingness is considered to be distinct from behavioural intention, as willingness is typically conceived in relation to what an individual is willing to do while intention reflects what an individual plans to do,[235, 240] some studies report that

compared to intention measures, willingness measures are actually better predictors of behaviours.[235, 236, 242, 243]

Similarly, while our study indicates that willingness predicts future SIF use, it is also noteworthy that changes in personal circumstances, including cessation from injection drug use, lower intensity injection drug use and infrequent exposure to the DTES, appear to have an expected deterrent effect on SIF use. Indeed, actively injecting drugs is a prerequisite for using the SIF, and the SIF has been shown to attract high intensity drug injectors.[244] In the context of using a SIF there are a number of factors that could influence an individual's behaviour, i.e. whether or not they use the SIF. For example, travel and waiting times and operating regulations such as a ban on assisted injections could constrain individuals and hinder their ability to use the facility despite an initial willingness or intention to use it. Indeed, previous studies have found that IDU identify travel time to the SIF from where they reside and purchase drugs as a significant barrier to visiting the facility.[245] Clearly, situational factors will influence whether an individual will use a supervised injection facility; however, we found that despite these multiple factors, willingness measures are meaningful indicators of later SIF use.

These findings have implications for the validity of willingness studies that have been conducted in other settings to assess the acceptability of establishing SIFs. For instance, a willingness study conducted among IDU in San Francisco recently reported

that 85% of local IDU were willing to use a SIF.[225] Our study suggests that policy planners in San Francisco can be confident that this measure is a good indicator of client uptake should a SIF be established in that area.

Our findings are also relevant to the planning of other types of public health programs and services for injection drug user populations as they suggest that willingness measures are relatively accurate markers of a population's intention to use a particular service. We should note that directly engaging with people who use drugs and assessing willingness prior to the establishment of a health service or program is consistent with a growing recognition of the importance of involving target populations in the planning and delivery of health and social services, particularly among vulnerable populations.[216, 246] Although assessing willingness is not a substitute for meaningful involvement, we suggest it can be a useful first step in engaging a target population in service design and delivery.

Our study has a number of potential limitations. Firstly, our measures relied on self-report which can be subject to socially desirable reporting and recall bias. Most importantly, socially desirable reporting could have inflated our measure of SIF attendance given its widespread support and acceptance among local drug users. Another potential limitation of our study is the generalizability of our findings. The Vancouver Injection Drug Users Study is not a randomized sample of injection drug users and may not be reflective of other drug user populations. Although this must be

taken into consideration when extrapolating these findings to other locations and populations of drug users, as mentioned previously, prior research has shown willingness to be good predictor of health related behaviour.[235]

In summary, we found that individuals who indicated that they were willing to use a SIF were more likely to later attend the Vancouver SIF once it was opened, even after we adjusted for factors expected to be associated with willingness. These data suggest that willingness measures may be valid tools for planning the delivery of health services among injection drug user populations and should be considered by future health program planners.

Table 4.1 Characteristics of study population stratified by attendance at Vancouver's supervised injection facility (n=442)

	Attended SIF		Univariate	
Characteristic [a]	**Yes** *n*= 289, *n* (%)	**No** *n*= 153, *n* (%)	**OR** [b] **(95% CI)** [c]	***p-value***
Prior Willingness to Use SIF				
Yes	198 (69)	76 (50)	2.20 (1.47 – 3.30)	<0.001
No	91 (31)	77 (50)		
Younger than 39 Yrs of Age [d]				
Yes	160 (55)	60 (39)	1.92 (1.29 – 2.86)	<0.001
No	129 (45)	93 (61)		
Female Gender				
Yes	122 (42)	64 (42)	1.02 (0.68 – 1.51)	0.938
No	167 (58)	89 (58)		
Unstable Housing [d]				
Yes	162 (56)	64 (42)	1.77 (1.19 – 2.64)	0.005
No	127 (44)	89 (58)		
Frequent Exposure to DTES [d]				
Yes	163 (56)	77 (50)	1.28 (0.86 – 1.89)	0.223
No	126 (44)	76 (50)		
Daily Cocaine Injection [d]				
Yes	94 (33)	31 (20)	1.90 (1.19 – 3.02)	0.007
No	195 (67)	122 (80)		
Daily Heroin Injection [d]				
Yes	95 (33)	24 (16)	2.63 (1.60 – 4.34)	<0.001
No	194 (67)	129 (84)		
Daily Crack Use [d]				
Yes	153 (53)	57 (37)	1.89 (1.27 – 2.83)	0.002
No	136 (47)	96 (63)		
Overdose (non-fatal) [d]				
Yes	21 (7)	1 (1)	11.91 (1.59 – 89.42)	0.016
No	268 (93)	152 (99)		
Public Injecting [d]				
Yes	142 (49)	36 (24)	3.14 (2.02 – 4.87)	<0.001
No	147 (51)	117 (76)		

Note: [a] All explanatory variables measured at first study visit during study period; [b] OR = Odds Ratio; [c] CI = Confidence Interval; [d] Denotes activities or situations referring to previous 6 months.

Table 4.2 Multivariate logistic regression analysis of factors associated with attending Vancouver's supervised injection facility (n=442)

Characteristic [a]	Adjusted Odds Ratio	(95% Confidence Interval)	*p-value*
Prior Willingness to Use SIF	1.67	(1.09 – 2.55)	0.019
Unstable Housing [b]	1.54	(1.01 – 2.34)	0.044
Daily Cocaine Injection [b]	1.52	(0.93 – 2.48)	0.095
Daily Heroin Injection [b]	1.63	(0.95 – 2.81)	0.076
Public Injecting [b]	2.35	(1.46 – 3.77)	<0.001

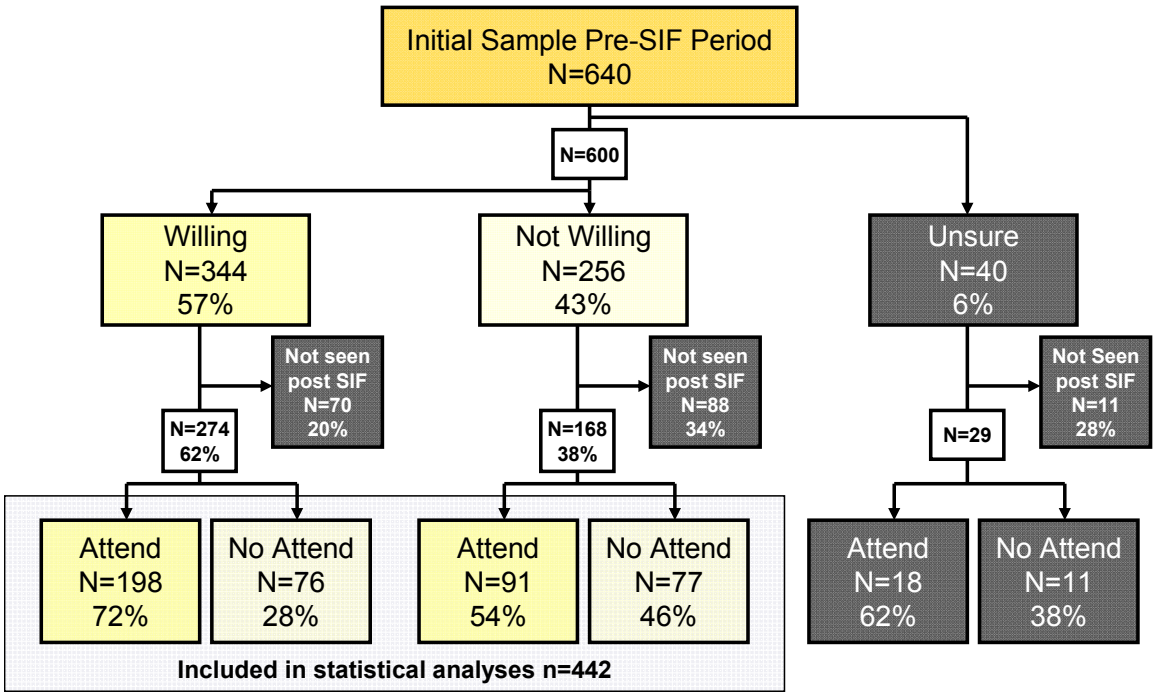
Note: [a]All explanatory variables were measured at first study visit during study period;
[b]Denotes activities or situations referring to previous 6 months.
*Overdose was not considered in this model due to low frequency counts.

Table 4.3 GEE analysis of factors associated with not using the supervised injection facility in the last six months (n=76) among those who initially reported being willing to use the facility (n=274)

	Univariate		Multivariate	
Characteristic [a]	**OR**[b] **(95% CI**[c]**)**	*p-value*	**AOR**[d] **(95% CI)**	*p-value*
Younger than 39 Yrs of Age				
Yes vs. No	1.65 (1.18 – 2.29)	0.003	**1.68 (1.21 – 2.34)**	**0.002**
Gender				
Female vs. Male	1.09 (0.75 – 1.58)	0.660		
Infrequent Exposure to DTES [e]				
Yes vs. No	1.93 (1.38 – 2.71)	<0.001	**1.86 (1.30 – 2.66)**	**<0.001**
Infrequent Cocaine Injection [e]				
< daily vs. ≥ daily	1.82 (1.36 – 2.44)	<0.001	**1.52 (1.12 – 2.06)**	**0.007**
Infrequent Heroin Injection [e]				
< daily vs. ≥ daily	2.80 (2.11 – 3.71)	<0.001	**2.46 (1.84 – 3.28)**	**<0.001**
Incarceration [e]				
Yes vs. No	0.78 (0.59 – 1.09)	0.141		
Any Addiction Treatment [e]				
Yes vs. No	1.42 (1.05 – 1.93)	0.024	1.23 (0.90 – 1.68)	0.185

Note: [a] Variable measures collected between December 2003 – November 2005; [b]OR = Odds Ratio; [c]CI = Confidence Interval; [d]AOR = Adjusted Odds Ratio; [e] Denotes activities or situations referring to previous 6 months.

Figure 4.1 Study sample



CHAPTER 5:

SOCIALIZING IN AN OPEN DRUG SCENE: THE RELATIONSHIP BETWEEN ACCESS TO PRIVATE SPACE AND STREET DISORDER[4]

5.1 Introduction

Drug-related street disorder, including public drug use and intoxication and loitering in public areas, negatively impacts neighbourhood businesses and surrounding communities and can detract from the enjoyment of public spaces.[40-42] Drug-related street disorder is a burden for law enforcement agencies and recent evidence suggests that exposure to street-based drug scenes poses risks to individual drug users.[49, 68, 247] Policy responses to address street disorder in open drug scenes have, to date, largely relied on law enforcement measures to deter disorderly behaviour in public settings.[62, 68, 127]

In some areas with concentrated drug and street disorder problems, police agencies have initiated crackdown campaigns, which involve targeting policing efforts on drug-related street disorder.[62, 68, 127] Increased police presence and patrol and arresting individuals for disorderly behaviours are some key features of crack-down campaigns.[62] In Canada, some provinces have also introduced legislation specific to

[4] A version of this chapter has been submitted for publication as: DeBeck, K., Wood, E., Qi, J., McArthur, D., Montaner, J., Kerr, T. Socializing in an open drug scene: The relationship between access to private space and street disorder.

street disorder. For instance, legislation in several Canadian provinces (i.e., the 'Safe Streets Act' in Ontario and British Columbia) provide law enforcement officers with additional tools to limit soliciting in public locations.[8, 144] Although law enforcement measures have been found to reduce the visual presence of street disorder,[97, 105, 140] these effects are typically short-lived and are often associated with unintended negative consequences.[69] These include displacing disorderly behaviour to surrounding areas and displacing illicit drug users away from health and social services.[107, 110, 112, 125, 133, 144, 248-250] Given the apparent limitations of law enforcement based approaches, there is a need to identify novel interventions with potential to address street disorder.

To date, policy-makers and researchers have given limited consideration to the potential role that the structure of the housing available to people who are entrenched in drug scenes may play in influencing the amount of time individuals spend on public streets and whether changing this structure might impact the amount of time drug users spend in the open drug scene. Restrictions on socializing in residential spaces, either through space constraints or regulations that impose barriers to having guests in private venues, may inadvertently contribute to street disorder.

Therefore, we sought to examine the relationship between time spent socializing in Vancouver's open drug scene and access to private space among local injection drug users (IDU). We hypothesized that spending time socializing in the open drug scene would be associated with having limited access to private space. We also sought to

assess whether IDU who report frequently socializing in Vancouver's open drug scene would be willing to reduce the amount of time spent socializing in this location if they were offered more access to private indoor space.

5.2 Methods

Data for this study were obtained from the Vancouver Injection Drug Users Study (VIDUS). For a full description of the study please refer to section 1.4 of this thesis. The present analyses are restricted to VIDUS participants seen for study follow-up during the period of June 2008 to June 2009 as measures for key variables of interest are available only for this period. If individuals were seen for multiple study follow-up visits during this study period only data from their first visit were used.

In our initial analysis the outcome of interest was spending time socializing in Vancouver's open drug market scene. To measure 'socializing' we asked respondents to estimate the average number of hours they spend on the street each day, and then we asked them to specify how many of those hours on average were spent socializing. Because we were interested in socializing in the open drug scene as an indicator of drug-related street disorder (and not simply spending time anywhere in the city), we restricted our definition of socializing to individuals who reported spending an average of three or more hours on the street each day socializing and who either resided in or frequently visit (at least two times per week) Vancouver's drug use epicenter, which is a well defined and described area of the city known as the Downtown Eastside.[69] All

respondents who did not frequently visit or reside in Vancouver's drug use epicenter or who reported spending less than three hours on average socializing on the street each day were included in the comparison group.

The primary explanatory variable of interest for the initial analysis was having 'limited private space for socializing'. Individuals who answered "no" to the question: "Do you have a private indoor space for socializing with friends and acquaintances?" were included in this category. Because we wanted to include an objective marker in our measure of access to private space for socializing we also considered the number of guests individuals were allowed to have in their residence at one time and all reports of being allowed less than three guests at one time were included in the 'limited private space' category even if respondents initially reported "yes" to having private space for socializing. Similarly, if other significant barriers to having guests in their residence were reported these individuals were also included in the category of having 'limited private space for socializing'. Significant barriers included 'guest fees' (typically $5-10 per guest), time restrictions on visitors, restrictions on the appearance of guests (e.g., visitors must be well groomed, can not appear intoxicated) and the requirement that guests must show picture ID. Participants that reported "yes" to having access to private space and reported none of the above restrictions to having guests were included in the comparison group.

To determine whether there was a significant relationship between our outcome of interest and our primary explanatory variable we *a priori* selected a range of secondary explanatory variables we hypothesized might be associated with both socializing in the open drug scene and having access to private space. Secondary explanatory factors included: age (per year older); gender (female vs. male); Aboriginal ancestry (yes vs. no); daily cocaine injection (yes vs. no); daily heroin injection (yes vs. no); daily crack cocaine smoking (yes vs. no); binge drug use, defined as a period of using drugs more often than usual (yes vs. no); sex trade involvement, defined as exchanging sex for money, shelter, drugs or other commodities (yes vs. no); participation in drug dealing (yes vs. no); having been employed (yes vs. no); having been incarcerated (yes vs. no); participation in any addiction treatment program (yes vs. no); and ever testing positive for HIV (which in our setting might influence the types of housing options available) (yes vs. no). Unless otherwise stated, all drug use and behavioural variables refer to the previous six-month period. To account for a potential seasonal influence on the about of time individuals spend on the street, we also included a categorical variable representing the month that participants completed our study questionnaire. This insured that our analysis adjusted for seasonal variation in responses.

We also sought to assess the relationship between socializing and different types of housing statuses. To do this we created a categorical variable for housing with 'stable housing' as the reference and conducted univariate analyses for housing status and

socializing. Categories for housing status were mutually exclusive and based on where participants were residing at the time of the interview. Categories included: stable housing, defined as living in a house or apartment; single room occupancy (SRO), defined as a single room in a hotel; shelter, defined as sleeping in temporary shelters for homeless individuals which are typically only open at night; no fixed address, defined as having no stable residence, including sleeping on the street as well as staying with friends or acquaintances on a short term basis, i.e., 'couch surfing'; treatment centre or recovery house, defined as living in residential addiction treatment centres or transitional addiction treatment recovery houses; jail, defined as being incarcerated in a prison; and other, which includes situations that did not fit into the above categories. Because housing status and access to private space are closely associated, this variable was not included as a secondary outcome of interest in the analysis assessing the relationship between socializing and access to private space.

To assess the relationship between socializing and access to private space, as a first step we conducted univariate analyses for our primary and secondary outcomes of interest stratified by socializing in the open drug scene. We used Pearson's chi-square test for dichotomous variables and the Mann-Whitney test for continuous variables. Fisher's exact test was used when one or more of the cell counts was less than or equal to five. To fit our multivariate model, we used a backwards selection process previously described by Maldonado and Greenland[232] and Rothman and Greenland.[233] Specifically, we began with all outcomes of interest in a full model. Using an automated procedure,

we subsequently generated a series of confounding models by removing each secondary factor of interest one at a time. For each of these models we assessed the relative change in the coefficient for our primary factor of interest (limited access to private space). The secondary outcome of interest that resulted in the smallest absolute relative change in the coefficient for 'limited access to private space' was then removed. This approach allowed us to identify the secondary outcomes of interest that had the strongest influence on the coefficient for our primary variable of interest while removing those that had the weakest relationship with 'limited access to private space'. Secondary variables continued to be removed through this process until the smallest relative change in the coefficient of 'limited access to private space' exceeded 5% of the value of the coefficient. The final model included limited access to private space and all remaining secondary explanatory variables.

In secondary analysis, we sought to assess and identify factors associated with willingness to relocate to indoor private locations if such spaces were made available among participants who reported socializing in the open drug scene and who have limited access to private indoor space. To measure willingness to relocate we asked participants "Would you spend less time socializing on the street if you had a private indoor space (or more private indoor space) for socializing with friends and acquaintances?" The geographic location of where private indoor space might be located was not specified and no additional description of the type of private space was given. Variables of interest for secondary analysis included all variables (with the

exception of limited access to private space) from the primary analysis, in addition to other risk factors that may influence willingness to relocate. Specifically, we considered self-reports of recent non-fatal overdose events (yes vs. no), borrowing and lending syringes already used to inject drugs (yes vs. no), having multiple sex partners (yes vs. no) and HIV positive serostatus (yes vs. no). We also considered recent encounters with police (last 30 days) and being a recent victim of violence, as individuals entrenched in drug market scenes have been identified as being particularly vulnerable to these experiences.[247] To assess whether the level of socializing influenced willingness to relocate we also considered the number of hours participants reported socializing in the open drug scene as a continuous variable (per additional hour reported). As in primary analysis, unless otherwise stated, all drug use and behavioural variables refer to the previous six-month period. As a first step, we used univariate analyses to determine factors associated with willingness to relocate. Categorical explanatory variables were analyzed using Pearson's chi-square test and continuous variables were analyzed using the Mann-Whitney test. Fisher's exact test was used when one or more of the cell counts was less than or equal to five. All variables that were associated with the dependent variable at $p < 0.05$ in univariate analyses were then entered in a multivariate logistic model. As with the primary analysis, we also created a categorical variable for housing status and conducted univariate analyses to assess the relationship between willingness to relocate and different types of housing statuses. Similarly, given the close association between number of hours socializing and housing status this variable was not

considered in the multivariate model. All statistical analyses were performed using SAS software version 9.1 (SAS, Cary, NC). All p-values are two sided.

5.3 Results

During the study period a total of 1,121 participants completed follow-up visits, including 396 (35%) women and 396 (35%) persons who identified as being of Aboriginal ancestry. The median age of all participants was 44 years (interquartile range [IQR] = 38-50), and the housing statuses of study participants are displayed in Figure 5.1. Among our sample of 1,121 participants, 477 individuals (43%) fit the criteria for socializing in the open drug scene. The characteristics of the study sample stratified by socializing in the open drug scene are presented in Table 5.1 and the distribution of the whole sample by housing status and access to private space is displayed in Figure 5.2.

Univariate associations between different types of housing statuses and socializing are presented in Table 5.2. When compared to participants with stable housing the no fixed address category was almost seven times more likely to socialize in the open drug scene, while individuals living in SROs and shelters were over three times more likely to socialize. The univariate analyses of associations between socializing in the open drug scene and other socio-demographic and behavioural variables are presented in Table 5.1. Having limited access to private space for socializing was significantly associated with socializing in the open drug scene (Odds

Ratio [OR] = 2.85, 95% Confidence Interval [CI]: 2.11-3.86). The results of the final multivariate logistic regression are shown in Table 5.3. The primary explanatory variable, limited access to private space, remained independently associated with socializing in the open drug scene (Adjusted Odds Ratio [AOR] =2.33, 95% CI: 1.68-3.24) after adjusting for Aboriginal ancestry, daily crack cocaine use, binge drug use, drug dealing and engagement in any addiction treatment.

In sub-analysis, 256 (65%) of the 392 participants that reported having limited access to private space and socializing in the open drug scene also reported being willing to relocate if they were provided with more access to private indoor space. The characteristics of these individuals stratified by willingness to relocate are presented in Table 5.4. Univariate associations between different types of housing statuses and willingness to relocate are presented in Table 5.5. When compared to participants with stable housing the no fixed address category was over ten times more likely to be willing to relocate, while individuals living in SROs and shelters were two and six times more likely to relocate respectively. The univariate analyses of associations between willingness to relocate and other socio-demographic and behavioural variables are presented in Table 5.4. Factors that were significantly associated with willingness to relocate include: number of hours spent socializing (OR =1.05, 95% CI: 1.01 – 1.09); age (OR =0.97, 95% CI: 0.95 – 0.99); daily heroin injection (OR =2.71, 95% CI: 1.60 – 4.64); encounters with police (OR =1.90, 95% CI: 1.19 – 3.04); and being a victim of violence (OR =2.01, 95% CI: 1.15 – 3.53). In multivariate logistic regression, presented in Table

5.6, daily heroin injection (AOR =2.27, 95% CI: 1.28-3.88) and being a recent victim of violence (AOR =1.81, 95% CI: 1.02-3.23) were independently associated with willingness to relocate.

5.4 Discussion

In the present study we found that, among local injection drug users, having limited private space was significantly associated with spending an average of three or more hours per day socializing in the open drug scene. This association persisted after adjustment for a range of potential confounding factors. Socializing in the open drug scene was also independently positively associated with daily crack cocaine use, binge drug use and drug dealing, while addiction treatment was negatively associated with socializing in this environment. The majority (65%) of those who had limited access to private space and spend significant time socializing in the open drug scene reported that they would be willing to relocate away from the open drug scene if they were provided with private space for socializing. It is notable that daily heroin injectors and individuals who were recent victims of violence reported being most willing to relocate socializing activities. When compared to IDU who lived in stable housing, study participants who lived in SROs, shelters and had no fixed address were significantly more likely to socialize in the open drug scene and were significantly more likely to be willing to relocate.

These findings are consistent with existing data highlighting that open drug scenes and congregations of drug users often exist in locations where rates of homelessness and unstable housing are a problem among drug user populations.[40, 152, 251] Although the links between homelessness and street disorder have been previously described,[3, 6, 152] to our knowledge our study is the first to highlight that a lack of access to private space is likely playing a role in generating street disorder in open drug scenes.

A central implication of these findings is that providing street-involved drug users with areas where they can socialize in comfort and privacy may offer potential to reduce a component of drug-related street disorder. The benefits of relocating street-involved individuals to indoor locations by providing housing or creating alternative venues for socializing appears particularly valuable given the burden that drug-related street disorder poses for law enforcement agencies and surrounding communities, as well as potential harms that exposure to drug scenes poses to drug users themselves.[3, 68]

Although it can be challenging to provide housing for some chaotic drug using individuals, there is a growing body of literature which suggests that approaches such as the "housing first" model, which provide drug using individuals with independent stable housing regardless of their drug use practices, are more successful than abstinence-based supportive housing in retaining and stabilizing active drug users.[252-254] Our study suggests that if these housing models can accommodate active drug users

and provide housing with social spaces for this population, they could play an important role in the reduction of street disorder. It is important to recognize, however, that there are potential unintended harms that might result from relocating active drug users into private indoor locations, particularly if these locations are unsupervised and do not have safeguards to manage behaviours that might be associated with active drug use, such as drug overdose events or illicit drug dealing which is often linked with violence given the unregulated nature of the illicit drug market.[46]

To address risks associated with active drug use, there may be a role for supervised drug consumption facilities integrated into supportive housing models. Indeed, the integration of supervised drug consumption facilities in one supportive housing facility for people with HIV/AIDS in Vancouver has been shown to be successful in reducing risky drug use practices on the premises.[255] Furthermore, in our study setting a number of non-profit housing societies have been able to successfully provide supportive housing for individuals who actively use drugs and have been able to manage behaviours associated with illicit drug use.[256, 257] Within these models, special consideration is given to ensuring that residents' health and physical security needs are met. In particular, measures are taken to accommodate and address the risks associated with drug use, including drug use which normally would take place in outdoor locations within the open drug scene.[256] The Portland Hotel Society is an example of a housing provider that manages roughly 450 housing units in the DTES, the majority of which are occupied by individuals who actively use drug and who fit the description of

'hard to house'.[256] The client-centred philosophy of the Portland Hotel Society is credited with enabling them to build relationships with their clients that facilitate the protection of clients' physical security and promote clients' overall well-being.[256, 258, 259]

Although there is now a wide literature suggesting that low-threshold housing options in line with a housing first model successfully support and retain individuals with high intensity addiction and, as our study indicates, have potential to reduce street disorder, low-threshold housing currently makes up only a small proportion of existing housing units.[11, 260] Our data add to existing evidence highlighting the need to increase the supply of low-threshold supportive housing that includes safeguards to manage behaviours associated with active illicit drug use including drug overdose events and drug dealing and accompanying risks for violence.[261, 262]

There are a number of limitations in this study. In particular, Vancouver's housing situation and open drug scene have unique features that may limit the generalizability of these finding. However, drug-related street disorder and lack of supportive housing for drug using populations are issues in many other urban settings and therefore the findings of this study may be relevant to other areas. In addition, a number of our measures were based upon self-report data and are therefore vulnerable to recall bias and social desirable responding. In this study, issues with recall could have resulted in an over- or underestimation of the number of hours spent on the street socializing, suggesting that if recall issues were present they would have biased our

result towards the null. If social desirable responding was an issue we suspect this response bias would have led to an underreporting of the number of hours spent on the street, which in turn may have led to an underestimation of the association between access to private space and socializing in the open drug scene. Finally, our second analysis relied on willingness responses and does not represent actual behaviour change. There are likely multiple factors that contribute to socializing in public spaces and providing private space may not change this behaviour. However, previous analyses evaluating the validity of reporting willingness to use a supervised injection facility on subsequent rates of use among illicit injection drug users found that willingness measures were reasonable predictors of later behaviour.[263]

In summary, our data indicate that a lack of access to private space among people who use drugs may contribute to street disorder in open drug scenes. Study findings further suggest that increasing access to private spaces that accommodate socializing among active drug users and include safeguards to manage behaviours associated with active illicit drug use has potential to reduce one component of street disorder. Low-threshold supportive housing approaches based on the housing first model appear to offer important opportunities to meet these objectives.

Table 5.1 Univariate analyses of factors associated with socializing in Vancouver's open drug scene among injection drug users (n=1121)

Characteristic	Socializes in open drug scene [a]		Univariate	
	Yes *n*= 477, *n* (%)	**No** *n*= 644, *n* (%)	**OR[b] (95% CI)**	*p-value*
Limited Private Space [d]				
Yes	407 (85)	432 (67)	2.85 (2.11 – 3.86)	<0.001
No	70 (15)	212 (33)		
Age (Median, IQR) [c]				
Per year older	43 (37-49)	45 (39-52)	0.97 (0.96 – 0.98)	<0.001
Female Gender				
Yes	173 (36)	223 (35)	1.07 (0.84 – 1.38)	0.570
No	304 (64)	421 (65)		
Aboriginal Ancestry				
Yes	196 (41)	200 (31)	1.55 (1.21 – 1.98)	<0.001
No	281 (59)	444 (69)		
Daily Cocaine Injection [d]				
Yes	53 (11)	45 (7)	1.66 (1.10 – 2.52)	0.016
No	424 (89)	599 (93)		
Daily Heroin Injection [d]				
Yes	121 (25)	97 (15)	1.92 (1.42 – 2.58)	< 0.001
No	356 (75)	547 (85)		
Daily Crack Use [d]				
Yes	261 (55)	187 (29)	2.95 (2.30 – 3.78)	< 0.001
No	216 (45)	457 (71)		
Binge Drug Use[d]				
Yes	233 (49)	198 (31)	2.15 (1.68 – 2.75)	< 0.001
No	244 (51)	446 (69)		
Sex Trade [d]				
Yes	68 (14)	53 (8)	1.85 (1.27 – 2.71)	0.001
No	409 (86)	591 (92)		
Drug Dealing [d]				
Yes	186 (39)	135 (21)	2.41 (1.85 – 3.14)	<0.001
No	291 (61)	509 (79)		
Employment [d]				
Yes	86 (18)	160 (25)	0.67 (0.50 – 0.89)	0.006
No	391 (82)	484 (75)		
Recent Incarceration [d]				
Yes	72 (15)	65 (10)	1.58 (1.11 – 2.27)	0.012
No	405 (85)	579 (90)		
Any Addiction Treatment [d]				
Yes	243 (51)	394 (61)	0.66 (0.52 – 0.84)	<0.001
No	234 (49)	250 (39)		
HIV Positive [d]				
Yes	151 (32)	214 (34)	0.93 (0.72 – 1.19)	0.558
No	322 (68)	423 (66)		

Note: [a] Socializing in the open drug scene was defined as living in or frequenting Vancouver's drug use epicentre and spending on average three or more hours on the street each day socializing.; [b] OR = Odds Ratio, CI = Confidence Interval; [c] IQR= Inter Quartile Range; [d] Denotes activities or situations referring to previous 6 months.

Table 5.2 Univariate analysis of housing status and socializing in Vancouver's open drug scene among injection drug users

Characteristic	Socializes in open drug scene [a]		Univariate	
	Yes *n*= 477, *n* (%)	**No** *n*= 644, *n* (%)	**OR[b] (95% CI)**	***p-value***
Housing Status [c]				
Stable Housing	78 (22)	273 (78)	- Reference-	
Room in Hotel (SRO)	225 (48)	245 (52)	3.21 (2.36 – 4.38)	<0.001
Shelter	19 (48)	21 (52)	3.17 (1.62 – 6.19)	<0.001
No Fixed Address/Street	146 (66)	75 (34)	6.81 (4.68 – 9.92)	<0.001
Treatment Recovery*	5 (29)	12 (71)	1.46 (0.39 – 4.61)	0.552
Jail (Prison)**	0 (0)	4 (100)	0.67 (0.00 – 5.40)	0.738
Other*	4 (22)	14 (82)	1.00 (0.23 – 3.31)	1.000

Note: [a] Socializing in the open drug scene was defined as living in or frequenting Vancouver's drug use epicenter and spending on average three or more hours on the street each day socializing.; [b]OR = Odds Ratio, CI = Confidence Interval; [c] Denotes current status.

*p-value and 95% CI reported from Fisher's Exact Test as 25% of cells had expected counts less than 5.

** Exact logistic model used due to presence of zero cell.

Table 5.3 Multivariate logistic regression analysis of primary and secondary factors associated with socializing[a] in Vancouver's open drug scene among injection drug users (n=1121)

Characteristic	Adjusted Odds Ratio	(95% Confidence Interval)	*p-value*
Limited Private Space [b]	2.33	(1.68 – 3.24)	<0.001
Aboriginal Ancestry	1.59	(1.21 – 2.09)	<0.001
Daily Crack Use [b]	1.79	(1.34 – 2.39)	<0.001
Binge Drug Use [b]	1.80	(1.36 – 2.38)	<0.001
Drug Dealing [b]	1.62	(1.19 – 2.20)	0.002
Any Addiction Treatment [b]	0.63	(0.49 – 0.82)	<0.001

Note: [a] Socializing was defined as living in or frequenting Vancouver's drug use epicenter and spending on average three or more hours on the street each day socializing.; [b] Denotes activities or situations referring to previous 6 months.

*Final model adjusted for the month that the interview was conducted

Table 5.4 Univariate analyses of injection drug users that have limited access to private space and engage in socializing[a] in Vancouver's open drug scene stratified by willingness to relocate (n=392)

	Willing to relocate socializing		Univariate	
Characteristic	**Yes** *n*=256,*n* (%)	**No** *n*=136, *n* (%)	**OR[b] (95% CI)**	***p-value***
Hours Socializing [c, d]	8 (4-12)	6 (4-12)	1.05 (1.01 – 1.09)	0.025
Age (per year older)	43 (36-48)	46 (40-50)	0.97 (0.95 – 0.99)	0.013
Female Gender				
yYes	96 (37)	51 (37)	1.00 (0.65 – 1.54)	1.000
No	160 (63)	85 (63)		
Aboriginal Ancestry				
Yes	104 (41)	54 (40)	1.04 (0.68 – 1.59)	0.860
No	152 (59)	82 (60)		
Daily Cocaine Injection [c]				
Yes	23 (9)	20 (15)	0.57 (0.30 – 1.09)	0.085
No	233 (91)	116 (85)		
Daily Heroin Injection [c]				
Yes	85 (33)	21 (15)	2.72 (1.60 – 4.64)	<0.001
No	171 (67)	115 (85)		
Daily Crack Use [c]				
Yes	157 (61)	71 (52)	1.45 (0.95 – 2.21)	0.081
No	99 (39)	65 (48)		
Binge Drug Use [c]				
Yes	130 (51)	64 (47)	1.16 (0.77 – 1.76)	0.483
No	126 (49)	72 (53)		
Overdose (non-fatal) [c]				
Yes	17 (7)	6 (4)	1.54 (0.59 – 4.00)	0.371
No	239 (93)	130 (96)		
Encounters with Police [e]				
Yes	97 (38)	33 (24)	1.90 (1.19 – 3.04)	0.006
No	159 (62)	103 (76)		
Victim of Violence [c]				
Yes	63 (25)	19 (14)	2.01 (1.15 – 3.53)	0.014
No	193 (75)	117 (86)		
Syringe Sharing* [c]				
Yes	7 (3)	3 (2)	1.25 (0.28 – 7.59)	1.000
No	249 (97)	133 (98)		
Sex Trade [c]				
Yes	44 (17)	18 (13)	1.36 (0.75 – 2.46)	0.307
No	212 (83)	118 (87)		
Drug Dealing [c]				
Yes	111 (43)	47 (35)	1.45 (0.94 – 2.23)	0.091
No	145 (57)	89 (65)		
Employment [c]				
Yes	44 (17)	18 (13)	1.36 (0.75 – 2.46)	0.307
No	212 (83)	118 (87)		
Recent Incarceration [c]				
Yes	48 (19)	16 (12)	1.73 (0.94 – 3.18)	0.075
No	208 (81)	120 (88)		
Any Addiction Treatment [c]				
Yes	122 (48)	72 (53)	0.81 (0.53 – 1.23)	0.319
No	134 (52)	64 (47)		
Multiple Sex Partners [c]				
Yes	52 (20)	24 (18)	1.19 (0.70 – 2.03)	0.525
No	204 (80)	112 (82)		
HIV Positive				
Yes	77 (30)	48 (36)	0.79 (0.51 – 1.23)	0.292
No	177 (70)	87 (64)		

Note: [a] Socializing was defined as spending on ave. 3+ hrs on the street each day; [b] OR = Odds Ratio, CI=Confidence Interval; [c] Denotes activities or situations referring to previous 6 months; [d] 'Hours Socializing' was defined as a continuous variable & measured per additional hr; [e] Denotes activities or situations referring to previous month. *p-value and 95% CI reported from Fisher's Exact Test as 25% of cells had expected counts less than 5.

Table 5.5 Univariate analysis of housing status and willingness to relocate among injection drug users

Characteristic	Willing to relocate socializing		Univariate	
	Yes *n*=256, *n*(%)	**No** *n*= 136, *n*(%)	**OR[b] (95% CI)**	***p-value***
Housing Status [c]				
Stable Housing	14 (35)	26 (65)	- Reference-	
Room in Hotel (SRO)	106 (56)	84 (44)	2.34 (1.15 – 4.77)	0.017
Shelter*	13 (76)	4 (24)	6.04 (1.45 –29.37)	0.008
No Fixed Address/Street	117 (85)	21 (15)	10.35 (4.67– 23.00)	<0.001
Treatment Recovery**	4(100)	0 (0)	8.95 (1.05 – infinity)	0.045
Jail	- -	- -		
Other*	2 (67)	1 (33)	3.71 (0.31 – 44.66)	0.545

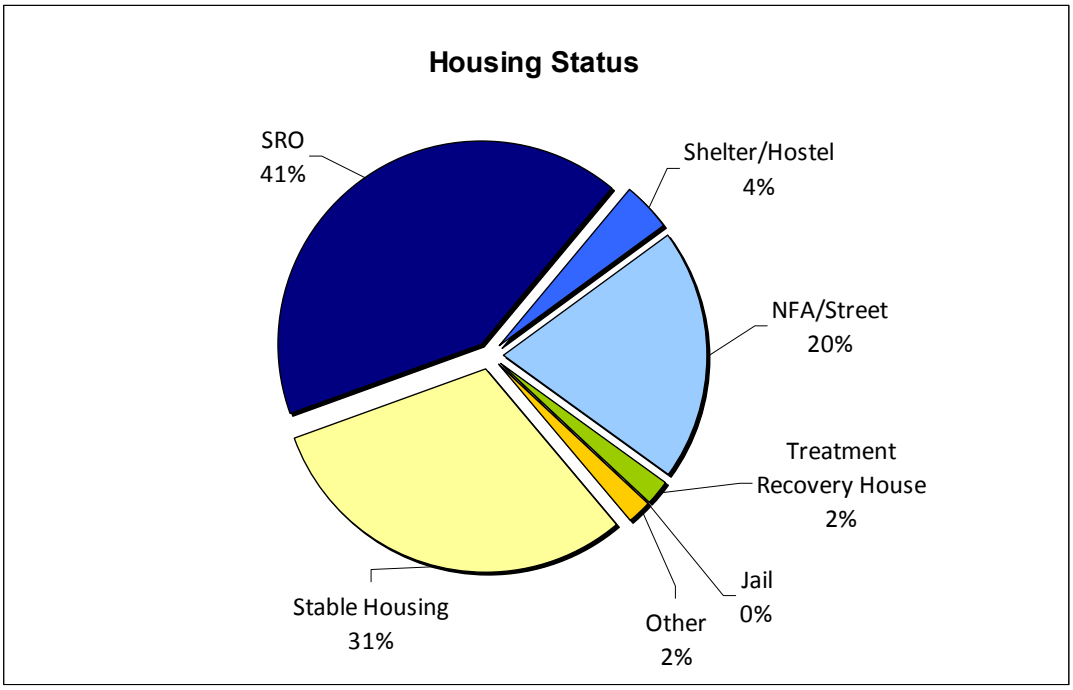
Note: [a] Socializing in the open drug scene was defined as living in or frequenting Vancouver's drug use epicenter and spending on average three or more hours on the street each day socializing.; [b]OR = Odds Ratio, CI = Confidence Interval; [c] Denotes current status.
*p-value and 95% CI reported from Fisher's Exact Test as 25% of cells had expected counts less than 5.** Exact logistic model used due to presence of zero cell.

Table 5.6 Multivariate logistic regression analysis of factors associated with willingness to relocate socializing activity[a] among injection drug users (n=392)

Characteristic	Adjusted Odds Ratio	(95% Confidence Interval)	*p-value*
Hours Socializing [b, c]	1.02	(0.98 – 1.07)	0.266
Age (per year older)	0.98	(0.96 – 1.01)	0.167
Daily Heroin Injection [b]	2.27	(1.28 – 3.88)	0.005
Encounters with Police [d]	1.47	(0.90 – 2.40)	0.124
Victim of Violence [b]	1.81	(1.02 – 3.23)	0.044

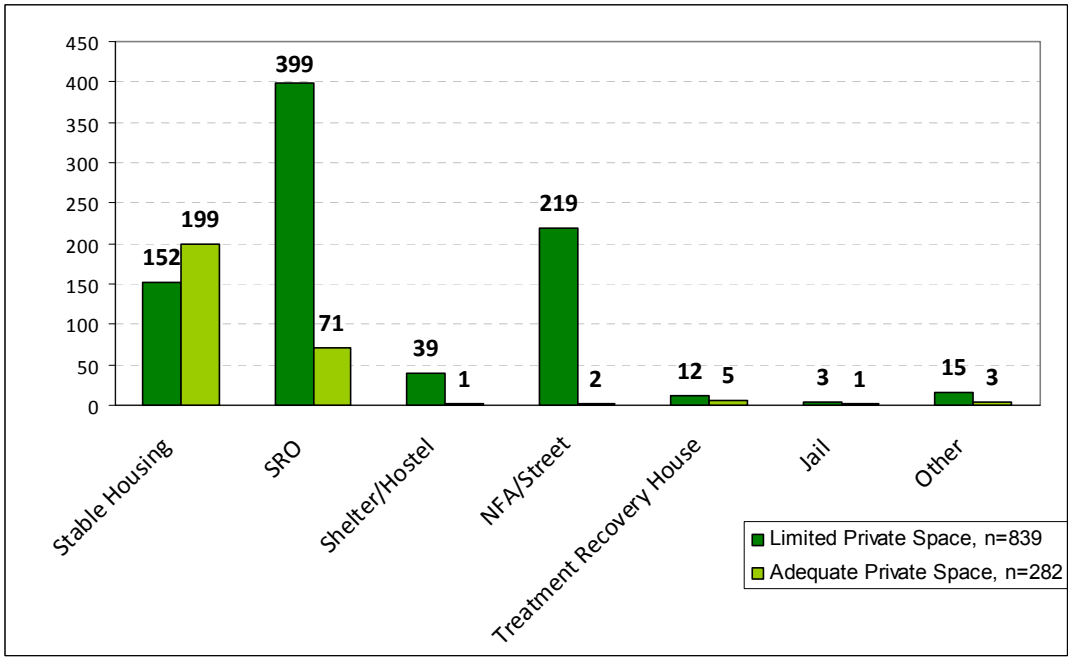
Note: [a] Socializing in the open drug scene was defined as living in or frequenting Vancouver's drug use epicenter and spending on average three or more hours on the street each day socializing; [b] Denotes activities or situations referring to previous 6 months; [c] 'Hours Socializing' was defined as a continuous variable and measured per additional hour; [d] Denotes activities or situations referring to previous month.

Figure 5.1 Housing status among injection drug users



Note: SRO –'Single Room Occupancy' defined as a single room in a hotel

Figure 5.2 Distribution of injection drug users by housing status and access to private space



Note: SRO –'Single Room Occupancy' defined as a single room in a hotel

CHAPTER 6:

OPPORTUNITIES FOR REDUCING ENGAGEMENT IN DISORDERLY INCOME GENERATION ACTIVITIES AMONG PEOPLE WHO INJECT ILLICIT DRUGS[5]

6.1 Introduction

There are many established links between chronic illicit drug use and engagement in illegal income generation activities.[171, 264-269] People who use illicit drugs and are struggling with addiction are often unable to acquire and sustain formal employment, and yet the high costs associated with obtaining illicit drugs requires individuals to find means of generating income.[33, 170-174] Given these constraints, the income generation opportunities available to illicit drug users frequently involve illegal activity and are often associated with street disorder.[7, 171] For example, common income generation strategies include street-based sex work, drug dealing, panhandling and recycling/salvaging/vending which often take place on public streets and are generally considered to be undesirable behaviours from a community perspective.[4, 7-10] In Vancouver, Canada these types of disorderly income generation activities are a well described feature of the city's drug use epicentre known as the Downtown Eastside [DTES].[4, 7, 10]

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[5] A version of this chapter has been submitted for publication as: DeBeck, K., Wood, E., Qi, J., McArthur, D., Montaner, J., Kerr, T. Opportunities for reducing engagement in street based income generation activities among people who inject illicit drugs.

To date, policy responses to address problems associated with illicit drug use, including street disorder resulting from the income generation activities of illicit drug users, typically rely on law enforcement to deter and manage undesirable behaviours.[57, 198, 200, 212, 270] However, it has been documented that in many instances law enforcement initiatives seeking to reduce street disorder result in displacing disorderly behaviour to surrounding neighbourhoods, which may negatively impact communities and/or separate vulnerable drug users from familiar health and social services.[62, 64, 69, 249] A growing body of health research suggests that interventions that target the behaviour of individuals, such as law enforcement, may be ineffective and inadvertently produce harm, as they fail to recognize and address the role that social and structural factors play in shaping behaviour.[73, 74, 76, 197] Indeed, interventions that are likely to have a more lasting and positive influence are ones that seek to alter the social and structural environment surrounding drug users as a means of changing behaviour.[75, 77, 78] In the context of disorderly income generation activities, one potential approach to reducing street disorder is to change the structural environment surrounding individuals who use drugs by creating sanctioned low-threshold employment opportunities.

In Vancouver, Canada there are a small number of existing low-threshold employment opportunities available to individuals who actively use illicit drugs. For example, in the DTES of Vancouver a community café and catering social enterprise company provides an estimated nine low-threshold employment positions,[176, 177] an organization that processes recyclable containers provides roughly 33 low-threshold

positions,[178, 179] a local drug users group provides a small number of stipends for volunteer work undertaken by their members[271-273] and a photo calendar project initiated by a social justice organization offers a program for residents of the DTES to become vendors and sell calendars and books.[180-182] Despite the existence of these opportunities, the number of low-threshold employment positions is limited and there is little information available to determine whether there is a significant demand for this type of work among individuals who currently engage in disorderly income generation activities.

Therefore, we sought to characterize the prevalence and correlates of engaging in disorderly income generation activities among a community recruited cohort of injection drug users (IDU) in Vancouver. We also sought to identify a sub-population of IDU who would be willing to cease engaging in these activities if other low-threshold work opportunities were made available to them.

6.2 Methods

Data for this study were obtained from the Vancouver Injection Drug Users Study (VIDUS). For a full description of the study please refer to section 1.4 of this thesis. The present analyses are restricted to VIDUS participants seen for study follow-up during the period of November 2008 to July 2009 as the measure for our outcome of interest was available only for this period. If individuals were seen for multiple study follow-up visits during this study period, only data from their first visit were used.

All participants seen during our study period were asked to identify all their income sources since their last study visit and to estimate the average number of hours per week they spent engaged in each income generation activity. Categories of income sources included recycling (includes salvaging recyclable materials and unsanctioned street vending), panhandling, squeegeeing, sex trade work and drug dealing. Other categories of income sources included welfare (including disability, pensions and other forms of government transfers), family and friends, regular job, temporary work (including under the table employment) and criminal activity (category encompasses a range of criminal activities including theft, break and entry, robbery and fraud).

In our primary analysis the outcome of interest was engaging in 'disorderly income generation activities' defined as reporting any of the following income sources: recycling, squeegeeing, panhandling, selling drugs and exchanging sex for money. Although we were unable to confirm that all reported drug dealing and sex work activities occurred in public settings, a previous study among VIDUS participants found that both activities are independently associated with spending time in Vancouver's open drug scene suggesting that these activities are largely street-based.[247] To characterize factors associated with engagement in disorderly income generation activities, we *a priori* selected a range of socio-demographic and behavioural variables that we hypothesized might be associated with our outcome of interest. These included: age (per year older); daily expenditure on drugs (per additional $10); gender (female vs. male); Aboriginal ancestry (yes vs. no); unstable housing, defined as currently living in

a single occupancy room in a hotel, a treatment or recovery house, jail, shelter or hostel, or having no fixed address for the last six months (yes vs. no); high school education, defined as completing high school or obtaining equivalent diploma (yes vs. no); having regular employment, defined as having a regular or temporary job (yes vs. no); daily cocaine injection (yes vs. no); daily heroin injection (yes vs. no); daily crack cocaine smoking (yes vs. no); non-fatal overdose (yes vs. no), binge drug use, defined as a period of using drugs more often than usual (yes vs. no); encounters with police in the last month, defined as being questioned, searched or stopped by police (yes vs. no); being a victim of violence (yes vs. no); syringe sharing, defined as borrowing or lending syringes already used by someone else to inject drugs (yes vs. no); using injection drugs in public locations, such as city streets, parks and alleys (yes vs. no); engaging in any unprotected sex (yes vs. no); being recently incarcerated (yes vs. no); and current enrolment in methadone treatment (yes vs. no). Unless otherwise stated, all drug use and behavioural variables refer to the previous six month period.

In sub-analysis, we sought to assess and identify predictors of willingness to cease engagement in disorderly income generation activities if alternative low-threshold options were made available. To measure willingness to cease engagement in disorder income generation activities we asked participants: “If you were offered casual work that did not interfere with your welfare, would you take it?” and “If yes, are there any income sources in the last 30 days that you would eliminate?” Participants were then asked to indicate which sources of income they would forgo. Variables of interest for

secondary analysis included all variables from the primary analysis, in addition to engagement in specific disorderly income generation activities, including recycling, panhandling, squeegeeing, drug dealing and sex work. As in the primary analysis, unless otherwise stated, all drug use and behavioural variables refer to the previous six month period.

For both our primary and secondary analyses, we used univariate and multivariate statistics to determine factors associated with our outcomes of interest. In univariate analysis categorical explanatory variables were analyzed using Pearson's chi-square test and continuous variables were analyzed using the Mann-Whitney test. Fisher's exact test was used when one or more of the cell counts was less than or equal to five. To evaluate factors independently associated with our outcomes of interest, all variables that were associated with the dependent variable at $p < 0.05$ in univariate analyses were entered into the respective multivariate logistic regression models. All statistical analyses were performed using SAS software version 9.1 (SAS, Cary, NC). All p-values are two sided.

6.3 Results

During the study period a total of 874 participants completed follow-up visits, including 310 (35%) women and 312 (36%) persons who identified as being of Aboriginal ancestry. The median age of participants was 45 years (interquartile range [IQR] = 39-51). Among our sample of 874 IDU a total of 418 (48%) reported engaging in

disorderly income generation activities. The median number of disorderly activities that participants engaged in was 1 (IQR = 1-1). As displayed in Table 6.1, drug dealing (n=220, 25%) and recycling (n=165, 19%) were the most common types of disorderly income generation activity, and the median number of hours spent engaged in disorderly income generation activities each week was highest for drug dealing (20 hrs per week, IQR = 6-40). The characteristics of the study sample stratified by engagement in disorderly income generation activities are presented in Table 6.2.

Among individuals who reported engaging in disorderly income generation activities, 198 (47%) indicated they would cease engaging in this activity if they had access to low-threshold employment. As shown in Table 6.1, among those who reported income from sex trade work, 51 (63%) indicated they would no longer engage in sex trade work if they had access to low-threshold employment. Further, 97 (44%) respondents who reported income from drug dealing, 21 (37%) respondents who reported engaging in panhandling and 48 (29%) respondents who engaged in recycling reported that they would refrain from engaging in those disorderly income generation activities if they had access to causal employment opportunities.

The univariate analyses of behavioural and socio-demographic variables associated with engaging in disorderly income generation activities are also presented in Table 6.2, while the results of the multivariate logistic regression analysis of factors associated with engaging in disorderly income generation activities are shown in Table

6.3. Factors that remained independently associated with our outcome of interest included: regular employment (adjusted odds ratio [AOR] = 0.48, 95%CI: 0.32-0.71); daily cocaine injection (AOR = 1.98, 95%CI: 1.05-3.76); daily crack cocaine smoking (AOR = 3.11, 95%CI: 2.17-4.45); binge drug use (AOR = 1.55, 95%CI: 1.12-2.14), encounters with police (AOR = 2.45, 95%CI: 1.61-3.72); being a victim of violence (AOR = 1.68, 95%CI: 1.06-2.68); syringe sharing (AOR = 4.50, 95%CI: 1.44-14.09); and public injecting (AOR = 2.03, 95%CI: 1.28-3.23).

For our secondary analysis, the univariate results of factors associated with willingness to cease engaging in disorderly income generation activities are presented in Table 6.4 and the results of the multivariate logistic regression analysis of factors associated with willingness to cease engaging in disorderly income generation activities are shown in Table 6.5. Factors that remained independently associated with our outcome of interest included: sex work (AOR = 2.54, 95%CI: 1.32-4.88), drug dealing (AOR = 1.86, 95%CI: 1.13-3.06), binge drug use (AOR = 1.56, 95%CI: 1.03-2.37), and incarceration (AOR = 1.88, 95%CI: 1.04-3.42).

6.4 Discussion

Among our sample of 874 IDU, we found that 48% reported engaging in a disorderly income generation activity in the last six months. The most common activities reported were drug dealing and recycling (which included salvaging and unsanctioned street vending). In a multivariate analysis people who reported engaging

in disorderly income generation activities were more likely to smoke crack cocaine on a daily basis and inject cocaine on a daily basis. This population was also more likely to engage in binge drug use, have encounters with police, be a victim of violence, share used syringes and inject drugs in public areas. Conversely, individuals with regular employment were significantly less likely to report engaging in disorderly income generation activities. We also found that among individuals who engaged in disorderly income generation activities, 47% reported that they would be willing to stop engaging in these disorderly activities if they were offered other opportunities for low-threshold employment. Individuals engaged in sex work, drug dealing, binge drug use, or who were recently incarcerated, were most interested in ceasing their engagement in disorderly income generation activities.

These findings support the conclusions of previous studies indicating that disorderly income generation activities are common among illicit drug users.[33, 171, 265, 268] The significant associations between engaging in disorderly income generation activities and daily crack cocaine smoking and daily cocaine injecting are consistent with a growing number of studies linking frequent cocaine use with a greater likelihood of engaging in risky behaviours[30-32] and illegal activities.[7, 33] These associations suggest that the compulsive drug acquisition behaviours associated with cocaine addiction may perpetuate the need to generate income through prohibited means. In particular, the relatively short half-life of cocaine compared with opioids or methamphetamine may contribute to an increased frequency of drug use and pressure to purchase larger

quantities of drugs.[274] In addition, the negative psychiatric effects of high intensity cocaine use may have destabilizing influences that present barriers to engaging in formal employment.[33] Indeed, previous research found that frequent crack cocaine smoking was negatively associated with attaining formal employment among IDU in our study setting.[173]

Our findings further indicate that individuals who engage in disorderly income generation activities are a vulnerable population at risk for multiple negative health and social outcomes. Many of the behaviours associated with disorderly income generation activities, including daily cocaine injection, daily crack cocaine smoking, binge drug use and syringe sharing, have all been independently linked with increased risk of HIV infection in this setting.[27, 275, 276] These findings underscore the importance of identifying interventions to reduce engagement in disorderly income generation activities, and our study findings further suggest that there is considerable willingness among many IDU to cease engaging in these activities if they were provided with opportunities for low-threshold employment. This finding is consistent with current literature in the drug use field that emphasizes the importance that structural factors, such as employment opportunities, play in shaping behaviour, and supports assertions that interventions that change the environment of drug users can reduce their engagement in risky behaviour.[75, 77, 78]

It is noteworthy that in our study participation in sex work was the strongest independent predictor of willingness to take low-threshold employment. Given the physical dangers and health risks associated with sex work, it is understandable that participant engaged in sex work were most likely to be willing to cease engaging in this behaviour if given other options to earn income.[10, 60] In addition to the inherent risks associated with sex work, numerous studies have also linked prohibitive sex-work legislation with increasing the vulnerability of sex workers and undermining their ability to protect their health and physical security.[57-59, 64] Although the intention of prohibitive sex-work legislation is to deter engagement in the activity, it appears that the laws that are implemented to reduce the harms of sex work are actually increasing risks. The strong demand for low-threshold employment found in the current study among individuals engaged in sex works suggests that there are important opportunities to reduce the prevalence of this activity through means that do not criminalize sex workers and carry the unanticipated negative consequences of criminal justice interventions. It is important to note, however, that the income earned through sex work is often much greater than through other income generation opportunities. Despite the potential for sex workers to reduce their engagement in sex work if alternative low-threshold employment opportunities where made available, it is likely that the incentives will not be sufficient for some sex workers. In addition to supporting the development of low-threshold employment opportunities, amending laws that limit

the ability of sex workers to protect their health and physical safety should be simultaneously considered and pursued.

IDU who engaged in drug dealing were also significantly more willing to cease this income generation activity if they were given alternative opportunities for low-threshold employment. This finding should be of particular interest to policy-makers given the high costs of drug law enforcement which attempt to deter illicit drug production and distribution with the threat of incarceration and legal penalties which, to date, have been limited in their ability to prevent engagement in drug dealing among IDU and other segments of the general population.[200, 277, 278]

It is clear from the high rates of engagement in disorderly income generation activities reported in our study that current direct and indirect prohibitions against behaviours such as drug dealing and sex work are not successfully deterring or preventing engagement in these activities. However, it is interesting to note that sex work and drug dealing, as well as recent incarceration, were all significantly associated with willingness to cease engagement in disorderly income generation activities. This may suggest that the deterrent influence of prohibitions against drug dealing and sex work could be successful in situations where IDU were given opportunities to choose other less risky income generation opportunities. Unfortunately, it currently appears that less risky income generation opportunities available to most IDU remain limited.[170, 173, 174]

A key implication of this study is that creating low-threshold employment opportunities and supporting existing initiatives that currently provide these positions has potential to reduce both street disorder and health risks currently faced by individuals who engage in disorderly income generation activities. Models of low-threshold employment for active illicit drug users already exist in our study setting and elsewhere;[176, 177, 179, 182, 273] however, our study suggests that increasing their capacity and availability has potential to reduce both individual- and community-level harms.

There are a number of limitations with this study. Firstly, VIDUS is not a random sample of injection drug users and therefore these findings may not generalize to other drug using populations. However, the association between crack cocaine smoking and street-based income generation suggests that our findings are likely not specific to injection drug use and may be relevant for crack cocaine smokers that do not have a history of injecting. Secondly, there are limitations with combining different street-based disorderly income generation activities into one category as each of these activities is unique and likely attracts different populations. It is evident from the sub-analysis presented herein that there are unique characteristics among each group. Although it is crude to combine these very different activities, from a policy perspective it is meaningful to provide a picture of the net factors associated with these activities, as well as direction as to whether a potential policy intervention will likely have an overall beneficial impact despite the differences among activities. While it would have been ideal to supplement our primary analysis with additional models that considered each

individual income generation activity separately, low event counts precluded these additional comparisons. A third limitation is that many of our measures relied on self-reported information concerning behaviours that are illegal and/or stigmatized, such as drug dealing, sex work and syringe sharing, and are therefore vulnerable to social desirable responding. In this present study, this could have resulted in an under-reporting of engagement in disorderly income generation activities and associated risks resulting in conservative estimates of the prevalence of these activities and risks. There are other limitations with our measures of street-based income generation activities. Specifically, the amount of money earned through street-based disorderly income generation activities does not account for 'in-kind' transactions or non-monetary contributions (i.e., exchanging sex for drugs, being paid in drugs rather than money for drug dealing, or receiving food when panhandling). This could have also led to an under-reporting of engagement in street-based disorderly income generation. Lastly, our study relied on willingness responses which do not represent actual behaviour change. There are potentially a host of external factors that might influence income generation behaviours, some of which may involve complex social networks and power relations. Therefore, the provision of low-threshold employment can not be expected to automatically translate into a reduction of street-based income generation among all participants that indicated a willingness to change their behaviour. However, it is important to note that previous analyses evaluating the validity of reporting willingness to use a supervised injection facility on subsequent rates of use among illicit

injection drug users found that willingness measures were reasonably accurate predictors of later behaviour among IDU.[263]

In summary, we found that 48% of our sample of IDU recently engaged in disorderly income generation activities, and these behaviours were associated with high intensity stimulant drug use and various markers of risk. However, we also found that a high percentage of IDU reported being willing to cease engagement in disorderly income generation activities if they had options for low-threshold employment. These findings indicate that low-threshold employment may offer important opportunities to reduce drug-related street disorder and associated harms.

Table 6.1 Participation in disorderly income generation activities among injection drug users (last 30 days) (n=874)

Income Source	N (%) reporting activity		Median hrs per week engaged in activity* (IQR)		N (%) would cease to engage in activity**	
Recycling	165	(19)	14	(8-30)	48	(29)
Panhandling	57	(7)	14	(4.5-40)	21	(37)
Squeegeeing	5	(1)	5	(2-10)	0	(0)
Drug Dealing	220	(25)	20	(6-40)	97	(44)
Sex Work	81	(9)	9	(3-21)	51	(63)

* Refers to number of hours spent doing the activity in the average week; **Indicates participants that would cease to engage in the activity if they had other opportunities for low-threshold employment.

Table 6.2 Univariate analyses of factors associated with engaging in disorderly income generation activities among injection drug users (n=874)

	Disorderly income generation [a]			
Characteristic	**Yes** *n*= 418, *n* (%)	**No** *n*= 456, *n* (%)	**OR[b] (95% CI)**	***p-value***
Age				
Per year older	43 (38-50) [c]	46 (41-51) [c]	**0.97 (0.95 – 0.98)**	**<0.001**
Daily Expenditure on Drugs				
Per additional $10	50 (30-100) [c]	30 (10-60) [c]	**1.05 (1.03 – 1.07)**	**<0.001**
Female Gender				
Yes	165 (39)	145 (32)	**1.40 (1.06 – 1.85)**	**0.018**
No	253 (61)	311 (68)		
Aboriginal Ancestry				
Yes	152 (36)	160 (35)	1.06 (0.80 – 1.39)	0.694
No	266 (64)	296 (65)		
Unstable Housing (current)				
Yes	110 (26)	58 (13)	**2.45 (1.73 – 3.48)**	**<0.001**
No	308 (74)	398 (87)		
High School Education				
Yes	199 (48)	248 (54)	**0.76 (0.58 – 0.99)**	**0.045**
No	219 (52)	208 (46)		
Regular Employment [d]				
Yes	55 (13)	137 (30)	**0.35 (0.25 – 0.50)**	**<0.001**
No	363 (87)	319 (70)		
Daily Cocaine Injection [d]				
Yes	49 (12)	18 (4)	**3.23 (1.85 – 5.64)**	**<0.001**
No	369 (88)	438 (96)		
Daily Heroin Injection [d]				
Yes	110 (26)	43 (9)	**3.43 (2.34 – 5.03)**	**< 0.001**
No	308 (74)	413 (91)		
Daily Crack Smoking [d]				
Yes	213 (51)	74 (16)	**5.36 (3.92 – 7.34)**	**< 0.001**
No	205 (49)	382 (84)		
Overdose (non-fatal) [d]				
Yes	20 (5)	7 (2)	**3.22 (1.35 – 7.70)**	**0.006**
No	398 (95)	449 (98)		
Binge Drug Use[d]				
Yes	230 (55)	150 (33)	**2.50 (1.90 – 3.28)**	**< 0.001**
No	188 (45)	306 (67)		
Encounters with Police [d]				
Yes	129 (31)	50 (11)	**3.62 (2.53 – 5.19)**	**< 0.001**
No	289 (69)	406 (89)		
Victim of Violence [d]				
Yes	84 (20)	42 (9)	**2.48 (1.66 – 3.69)**	**< 0.001**
No	334 (80)	414 (91)		
Syringe Sharing [d]				
Yes	28 (7)	4 (1)	**8.11 (2.82 – 23.33)**	**< 0.001**
No	390 (93)	452 (99)		
Public Injecting [d]				
Yes	148 (35)	52 (11)	**4.26 (3.00 – 6.05)**	**< 0.001**
No	270 (65)	404 (89)		
Unprotected Sex [d]				
Yes	113 (27)	98 (21)	1.35 (0.99 – 1.85)	0.056
No	305 (73)	358 (79)		
Recent Incarceration [d]				
Yes	65 (16)	30 (7)	**2.61 (1.66 – 4.12)**	**< 0.001**
No	353 (84)	426 (93)		
Methadone Treatment (current)				
Yes	188 (45)	218 (48)	0.89 (0.68 – 1.16)	0.402
No	230 (55)	238 (52)		

Note: [a] Disorderly income generation includes: recycling, squeegeeing, panhandling, selling drugs and engaging in sex work; [b] OR = Odds Ratio, CI = Confidence Interval; [c] Median and Interquartile Range; [d] Denotes activities or situations referring to previous six months.

Table 6.3 Multivariate logistic regression analysis of factors associated with participation in disorderly income generation activities [a] among injection drug users (n=874)

Characteristic	Adjusted Odds Ratio	(95% Confidence Interval)	*p-value*
Older Age	1.00	(0.98 – 1.02)	0.799
Female Gender	1.12	(0.79 – 1.57)	0.526
Unstable Housing (current)	0.96	(0.61 – 1.52)	0.864
Regular Employment [b]	**0.48**	**(0.32 – 0.71)**	**< 0.001**
High School Education	0.89	(0.65 – 1.22)	0.474
Daily Expenditure on Drugs [b]	1.01	(1.00 – 1.03)	0.121
Daily Cocaine Inject [b]	**1.98**	**(1.05 – 3.76)**	**0.036**
Daily Heroin Inject [b]	1.40	(0.86 – 2.26)	0.175
Daily Crack Smoking [b]	**3.11**	**(2.17 – 4.45)**	**< 0.001**
Overdose (non-fatal) [b]	1.83	(0.67 – 5.01)	0.239
Binge Drug Use [b]	**1.55**	**(1.12 – 2.14)**	**0.008**
Encounters with Police [b]	**2.45**	**(1.61 – 3.72)**	**< 0.001**
Victim of Violence [b]	**1.68**	**(1.06 – 2.68)**	**0.028**
Syringe Sharing [b]*	**4.50**	**(1.44 – 14.09)**	**0.010**
Public Injection [b]	**2.03**	**(1.28 – 3.23)**	**0.003**
Incarceration [b]	1.10	(0.63 – 1.91)	0.740

Note: [a] Disorderly income generation activities include: recycling, squeegeeing, panhandling, selling drugs, and engaging in sex work.; [b] Denotes activities or situations referring to previous 6 months.

*p-value and 95% CI reported from Fisher's Exact Test as 25% of cells had expected counts less than 5.

Table 6.4 Univariate analyses of factors associated with willingness to cease engaging in disorderly income generation activities among injection drug users (n=418)

Characteristic	Willing to cease engaging in disorderly income generation [a] Yes *n*= 198, *n* (%)	No *n*= 220, *n* (%)	OR[b] (95% CI)	*p-value*
Age				
Per year older	43 (37-49)	44 (38-51)	0.98 (0.96 – 1.00)	0.006
Daily Expenditure on Drugs				
Per additional $10	60 (30-100) [c]	50 (20-100) [c]	1.01 (1.00 – 1.03)	0.073
Female Gender				
Yes	88 (44)	77 (35)	**1.49 (1.00 – 2.20)**	**0.049**
No	110 (56)	143 (65)		
Aboriginal Ancestry				
Yes	81 (41)	71 (32)	1.45 (0.97 – 2.17)	0.067
No	117 (59)	149 (68)		
Unstable Housing (current)				
Yes	63 (32)	47 (21)	**0.73 (0.49 – 1.07)**	**0.105**
No	135 (68)	173 (79)		
High School Education				
Yes	86 (43)	113 (51)	**0.76 (0.58 – 0.99)**	**0.045**
No	112 (57)	107 (49)		
Regular Employment [d]				
Yes	23 (12)	39 (18)	0.61 (0.35 – 1.06)	0.079
No	175 (88)	181 (82)		
Sex Work [d]				
Yes	52 (26)	29 (13)	**2.34 (1.42 – 3.88)**	**<0.001**
No	146 (74)	191 (87)		
Drug Dealing [d]				
Yes	122 (62)	98 (45)	**2.00 (1.35 – 2.95)**	**<0.001**
No	76 (38)	122 (55)		
Recycling [d]				
Yes	67 (34)	98 (45)	**0.64 (0.43 – 0.95)**	**0.025**
No	131 (66)	122 (55)		
Panhandling [d]				
Yes	27 (14)	30 (14)	1.00 (0.57 – 1.75)	1.000
No	171 (86)	190 (86)		
Daily Cocaine Injection [d]				
Yes	24 (12)	25 (11)	1.08 (0.59 – 1.95)	0.810
No	174 (88)	195 (89)		
Daily Heroin Injection [d]				
Yes	61 (31)	49 (22)	**1.55 (1.00 – 2.41)**	**0.048**
No	137 (69)	171 (78)		
Daily Crack Smoking [d]				
Yes	108 (55)	105 (48)	1.31 (0.89 – 1.93)	0.164
No	90 (45)	115 (52)		
Overdose (non-fatal) [d]				
Yes	11 (6)	9 (4)	1.38 (0.56 – 3.40)	0.484
No	187 (94)	221 (96)		
Binge Drug Use[d]				
Yes	125 (63)	105 (48)	**1.88 (1.27 – 2.77)**	**0.002**
No	73 (37)	115 (52)		
Encounters with Police [d]				
Yes	69 (35)	60 (27)	1.43 (0.94 – 2.16)	0.094
No	129 (65)	160 (73)		
Victim of Violence [d]				
Yes	42 (21)	42 (19)	1.14 (0.71 – 1.84)	0.589
No	156 (79)	178 (81)		
Syringe Sharing [d]				
Yes	14 (7)	14 (6)	1.12 (0.52 – 2.41)	0.773
No	184 (93)	206 (94)		
Public Injecting [d]				
Yes	81 (41)	67 (30)	**1.58 (1.06 – 2.37)**	**0.026**
No	117 (59)	153 (70)		
Unprotected Sex [d]				
Yes	59 (30)	54 (25)	1.30 (0.85 – 2.01)	0.227
No	139 (70)	166 (75)		
Recent Incarceration [d]				
Yes	43 (22)	22 (10)	**2.50 (1.43 – 4.35)**	**0.001**
No	155 (78)	198 (90)		
Methadone Treatment (current)				
Yes	103 (52)	95 (43)	1.43 (0.97 – 2.10)	0.071
No	95 (48)	125 (57)		

Note: [a] Disorderly income generation includes: recycling, squeegeeing, panhandling, selling drugs and sex work; [b] OR = Odds Ratio, CI = Confidence Interval; [c] Median and Inter Quartile Range; [d] Denotes activities or situations referring to previous 6 months.

Table 6.5 Multivariate logistic regression analysis of factors associated with willingness to cease engaging in disorderly income generation among injection drug users (n=418)

Characteristic	Adjusted Odds Ratio	(95% Confidence Interval)	*p-value*
Female Gender	1.00	(0.60 – 1.67)	0.998
Unstable Housing [b]	1.35	(0.80 – 2.28)	0.263
Sex Work [d]	**2.54**	**(1.32 – 4.88)**	**0.005**
Drug Dealing [d]	**1.86**	**(1.13 – 3.06)**	**0.014**
Recycling [d]	1.25	(0.74 – 2.09)	0.405
Daily Heroin Inject [b]	1.05	(0.63 – 1.74)	0.864
Binge Drug Use [b]	**1.56**	**(1.03 – 2.37)**	**0.036**
Public Injection [b]	1.09	(0.66 – 1.80)	0.748
Incarceration [b]	**1.88**	**(1.04 – 3.42)**	**0.037**

Note: [a] Disorderly income generation includes: recycling, squeegeeing, panhandling, selling drugs, and engaging in sex work.; [b] Denotes activities or situations referring to previous 6 months.

CHAPTER 7:

PUBLIC CRACK COCAINE USE AND WILLINGNESS TO USE A SUPERVISED INHALATION FACILITY: IMPLICATIONS FOR STREET DISORDER[6]

7.1 Introduction

The use of illicit drugs in public settings, including street, alleys and parks is both a public health and public order concern in many urban areas.[6, 42, 91] To date, the use of injection drugs in public settings has received the most attention from policy-makers and public health researchers.[5, 42] Public injecting is known to present problems for citizens who reside in or around areas where public drug use is prevalent, and scientific studies have documented that using injection drugs in public settings can discourage safer injecting practices resulting in many public health problems, including increased risk for drug overdose events and HIV and other blood-borne infections.[61-64, 83] As a result, some cities have implemented supervised injection facilities which aim to provide an alternative injecting environment that reduces both the health risks associated with injection drug use and the street disorder it can generate.[20, 150, 151, 153, 154] While supervised injection facilities have been noted to have measurable success in achieving these public health and public order objectives, the use of inhalable drugs,

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particularly crack cocaine smoking, has been growing in popularity in many street-based drug scenes across Canada.[26, 27, 29] Indeed, the popularity of crack cocaine and ease of administration through smoking has made public crack cocaine use a common feature of the streets in Vancouver's drug use epicentre, known as the Downtown Eastside.[279] Public crack cocaine smoking is posing a growing burden for law enforcement agencies responsible for maintaining public order.[280] In addition, the health and social harms associated with crack cocaine smoking are extensive. Compared to other drug user populations, crack cocaine users are more likely to engage in risky behaviours[30-32] and illegal activities[7, 33] and to experience homelessness[29] and health problems,[29, 34-37] yet are less likely to access health and social services.[38] It has also been recently documented that daily crack cocaine smokers are at a four-fold greater risk of contracting HIV compared to their drug using peers who smoke crack cocaine less often or not at all.[27]

Given the dramatic rise in crack cocaine smoking and the public order and public health concerns associated with it, the need for targeted interventions for people who smoke crack cocaine is unambiguous. One potential intervention that is receiving increasing attention from public health officials, health researchers and local community groups is supervised drug consumption facilities similar to Vancouver's supervised injection site but that accommodate crack cocaine smoking.[27, 281-285] The Canadian Institutes of Health Research recently approved funding to conduct a randomized control trial to evaluate the impact of a supervised inhalation facility on

access to medical and social services, particularly addiction treatment, among Vancouver-based crack cocaine smokers.[286] Previous studies have assessed general willingness among local drug users to use a supervised inhalation facility;[287, 288] however, these studies were not primarily concerned with street disorder and therefore did not consider the specific risks associated with smoking crack cocaine in public areas, nor did they assess willingness to use an inhalation facility among public crack cocaine smokers exclusively. Therefore we conducted a study focused on public crack cocaine smokers to identify factors associated with this practice. We also sought to assess willingness to use an inhalation facility among individuals who smoke crack cocaine in public areas to determine the potential impact a supervised inhalation facility might have on street disorder in Vancouver, Canada.

7.2 Methods

Data for this study were obtained from the Vancouver Injection Drug Users Study (VIDUS). For a full description of the study please refer to section 1.4 of this thesis. The present analyses are restricted to VIDUS participants who reported smoking crack cocaine in the last six months, and were seen for study follow-up visits during the period of November 2008 and June 2009 as measures for one of our outcomes of interest are available only for this sample period.

In our first analysis among crack cocaine smokers, the outcome of interest was using drugs (non-injection) in public areas in the last six months. As in previous

analyses, public areas included city streets, parks, public washrooms, parking lots, clubs or bars and abandoned buildings.[3] To characterize our outcome of interest we *a priori* selected a range of socio-demographic and behavioural variables we hypothesized might be associated with smoking crack cocaine in public areas. These included: age (per year older); gender (female vs. male); Aboriginal Ancestry (yes vs. no); limited access to private space, defined as answering "no" to the question: "Do you have a private indoor space for socializing with friends and acquaintances?" or reporting that the number of guests they were allowed to have in their residence at one time was restricted to less than three[289] (yes vs. no); daily cocaine injection (yes vs. no); daily heroin injection (yes vs. no); daily crack cocaine smoking (yes vs. no); non-fatal overdose, self identified by participants (yes vs. no), encounters with police in the last month, defined as being questioned, searched or stopped by police (yes vs. no); being a victim of violence defined as being physically assaulted (yes vs. no); sex trade involvement, defined as exchanging sex for money, shelter, drugs or other commodities (yes vs. no); and participation in drug dealing (yes vs. no). Unless otherwise stated, all drug use and behavioural variables refer to the previous six month period.

In a second analysis, we sought to assess and identify predictors of willingness to use a supervised inhalation room. Because we were particularly concerned with public drug use, we restricted our sample to crack cocaine smokers that reported recently using non-injection drugs in public areas. To measure willingness we asked participants

"If there was a safe place to smoke your drugs (ventilated inhalation room), close to where you buy or use, would you use it?"

Variables of interest for our second analysis were also selected *a priori* based on factors we hypothesized might be associated with willingness to use an inhalation room. These included: age (per year older); gender (female vs. male); Aboriginal Ancestry (yes vs. no); limited access to private space, as defined above, (yes vs. no); drug scene exposure, defined as spending an average of seven or more hours on the street each day in Vancouver's drug use epicentre in the previous six months[247] (yes vs. no); most drug use in public areas, defined based on reports that public locations were where they most frequently used drugs (yes vs. no); daily crack cocaine smoking (yes vs. no); risky pipe sharing, defined as reporting sharing a crack pipe or mouthpiece in the same six month period as having burns or sores on their mouth (yes vs. no); encounters with police in the last month (yes vs. no); and being a victim of violence (yes vs. no). As above, unless otherwise stated, all drug use and behavioural variables refer to the previous six month period.

For both of our first and second analyses, we used univariate and multivariate statistics to determine factors associated with our outcomes of interest. In univariate analysis categorical explanatory variables were analyzed using Pearson's chi-square test and continuous variables were analyzed using the Wilcoxon rank sum test. Fisher's exact test was used when one or more of the cell counts was less than or equal to five.

To evaluate factors independently associated with our outcomes of interest, all variables that were $p < 0.05$ in univariate analyses were entered into the respective multivariate regression models. All statistical analyses were performed using SAS software version 9.1 (SAS, Cary, NC). All p-values are two sided.

7.3 Results

During the study period 623 participants were seen for study follow-up visits and reported smoking crack cocaine in the last six months. These included 249 (40%) women and 231 (37%) persons who identified as Aboriginal. Among our sample of 623 crack cocaine smokers, a total of 382 (61%) reported using in public areas in the last six months. The characteristics of the study sample stratified by public drug use are presented in Table 7.1, and the univariate analyses of behavioural and socio-demographic variables associated with public drug use among crack cocaine smokers are presented in Table 7.2. The results of the multivariate logistic regression for factors associated with public drug use among crack cocaine smokers are also shown in Table 7.2. Factors that remained independently associated with our outcome of interest included: daily heroin injection (adjusted odds ratio [AOR] = 1.95, 95%CI: 1.17-3.27), daily crack cocaine smoking (AOR = 2.17, 95%CI: 1.49-3.14), encounters with police (AOR = 1.69, 95%CI: 1.07-2.68) and drug dealing (AOR = 1.61, 95%CI: 1.06-2.47).

For our second analysis, the demographic and behavioural characteristics of public crack cocaine smokers stratified by willingness to use a supervised inhalation

room are presented in Table 7.3 and the univariate results of factors associated with willingness to use a supervised inhalation room are presented in Table 7.4. The results of the multivariate logistic regression for factors associated with willingness to use a supervised inhalation room are also shown in Table 7.4. Factors that remained independently associated with willingness included: female gender (AOR = 2.11, 95% CI: 1.26-3.55), risky pipe sharing (AOR = 5.50, 95% CI: 1.63-18.56) and recent encounters with police (AOR = 2.09, 95% CI: 1.20-3.65).

7.4 Discussion

We found that the majority of crack cocaine smokers in our study reported having used drugs in public areas at some point in the last six months. This group was more likely to be higher-intensity drug users with respect to heroin injection and crack cocaine smoking, have encounters with the police and be involved in drug dealing. Of these public crack cocaine smokers, 71% reported being willing to use a supervised inhalation room if one was available. Individuals who reported being willing were more likely to be female, engage in risky pipe sharing and have encounters with the police.

The profile of public crack cocaine smokers as higher-intensity drug users who have interactions with the criminal justice system is reflective of previous findings describing public injection drug user populations.[5, 6, 290] Our finding that 71% of public crack cocaine smokers are willing to use an inhalation facility also supports previous

willingness estimates conducted among the general population of Vancouver-based illicit drug users and suggests that an intervention of this nature will likely reach the target population.[288] The high degree of willingness that this study found among public crack cocaine smokers to use an inhalation facility suggests that, like supervised injection facilities, these interventions are likely to successfully encourage public drug users to relocate to indoor venues.

Interestingly, one of the common features among both public crack cocaine smokers and those who are willing to use a supervised inhalation facility is their elevated likelihood of recently having encounters with law enforcement. This suggests that public crack cocaine smokers who are the subject of law enforcement attention are very willing to relocate to alternative off-street and health-focussed environments if they were made available. Indeed, our data indicate that 81% of public crack cocaine smokers who have had a recent encounter with police are willing to use a supervised inhalation facility.

A key implication of these findings is that there is a large demand for supervised inhalation rooms among individuals that are potentially key contributors to drug-related street disorder. The association between public crack cocaine smoking and encounters with police suggests that interventions of this nature are likely to target a critical sub-population of drug users and could be a valuable tool for police in the management of street disorder. Previous studies have found that Vancouver police

regularly refer public injection drug users to the local supervised injection facility.[291] Since our analysis indicates that local police are already frequently interacting with public crack cocaine smokers, the establishment of a supervised inhalation facility could provide a unique opportunity for police to direct this vulnerable group to a low-threshold service where they will have opportunities to be linked with appropriate health and social services.

This study has a number of limitations. Firstly, VIDUS is a community recruited non-randomized sample and therefore our findings may not be generalizable to other settings. If supervised inhalation facilities are being considered in other settings, willingness studies should be conducted among the local target populations and should not rely on the findings emerging from our setting. The generalizability of our findings is also limited by our study sample which was restricted to individuals with a history of injection drug use. Crack cocaine smokers who did not have a history of injection drug use were not eligible for our study. Given the harms associated with injection drug use we anticipate that if a selection effect were present it would likely bias our sample towards high risk drug users, suggesting that this group would be an appropriate target population for public health intervention. We should also note that among our study sample daily crack cocaine smoking was significantly more common than daily injecting, suggesting that despite the requirement of a history of injecting, our sample represents a primarily crack cocaine smoking population. Secondly, some of our measures relied on self-report and could be vulnerable to socially desirable reporting.

This would have likely been of most relevance to our measure of willingness, since respondents might perceive a pressure to report being willing to engage with low-threshold services of this nature given the widespread activism among local drug users in our study setting to implement supervised drug consumption facilities.[284] While it is possible that some respondents may over-report willingness, a previous study comparing measures of willingness to use a supervised injection facility before it was established with later reports of actual attendance after an injection facility was established suggests that willingness measures are good predictors of later behaviour among this population.[263] Lastly, socially desirable reporting could have influenced reports of stigmatized behaviour, such as public drug use, leading to an underestimation of public crack cocaine smoking. If social desirability was an issue in our study we suspect our finding would be a conservative indication of the prevalence of and harms associated with public drug use among crack cocaine smokers.

In summary, our study found that locally, public crack cocaine smoking is a common practice that is also associated with recent encounters with police. We found that the majority of public crack cocaine smokers were willing to use an inhalation facility if one were available. Furthermore, public crack cocaine smokers who had recent encounters with police were even more likely to be willing to use an inhalation room, suggesting that supervised inhalation facilities may offer unique opportunities to decrease one component of drug-related street disorder and reduce the burden on local law enforcement agencies.

Table 7.1 Characteristics of crack cocaine smokers stratified by public drug use (n=623)

	Public drug use [a]	
Characteristic	**Yes** *n*= 382, *n* (%)	**No** *n*= 241, *n* (%)
Age pre year older		
(Median, IQR) [c]	43 (37-49)	46 (40-50)
Female Gender		
Yes	145 (38)	104 (43)
No	237 (62)	137 (57)
Aboriginal Ancestry		
Yes	137 (36)	94 (39)
No	245 (64)	147 (61)
Limited Access to Private Space [d]		
Yes	316 (83)	169 (70)
No	66 (17)	72 (30)
Daily Cocaine Injection [d]		
Yes	39 (10)	9 (4)
No	343 (90)	232 (96)
Daily Heroin Injection [d]		
Yes	107(28)	25 (10)
No	275 (72)	216 (90)
Daily Crack Smoking [d]		
Yes	220 (58)	72 (30)
No	162 (42)	169 (70)
Overdose (non-fatal)[d]		
Yes	18 (5)	3 (1)
No	364 (95)	238 (99)
Encounters with police [e]		
Yes	114 (30)	35 (15)
No	268 (70)	206 (85)
Victim of Violence [d]		
Yes	77 (20)	30 (12)
No	305 (80)	211 (88)
Sex Trade [d]		
Yes	60 (16)	19 (8)
No	322 (84)	222 (92)
Drug Dealing [d]		
Yes	150 (39)	46 (19)
No	232 (61)	195 (81)

Note: [a] Public locations include: city streets, parks, public washrooms, parking lots, clubs or bars, and abandon buildings; [c] IQR= Inter Quartile Range; [d] Denotes activities or situations referring to previous 6 months; [e] Denotes activities or situations referring to previous month.

Table 7.2 Univariate and multivariate analyses of factors associated with public drug use among crack cocaine smokers [a] (n=623)

	Univariate		Multivariate	
Characteristic	**OR[b] (95% CI)**	***p-value***	**AOR (95% CI)**	***p-value***
Older Age				
Per year older	**0.96 (0.94 – 0.98)**	**<0.001**	0.98 (0.96 – 1.00)	0.065
Gender				
Female vs. Male	0.81 (0.58 – 1.12)	0.197		
Aboriginal Ancestry				
Yes vs. No	0.87 (0.63 – 1.22)	0.429		
Limited Access to Private Space [e]				
Yes vs. No	**2.04 (1.39 – 2.99)**	**<0.001**	1.49 (0.99 – 2.26)	0.058
Daily Cocaine Injection [e]				
Yes vs. No	**2.93 (1.39 – 6.17)**	**0.003**	1.70 (0.77 – 3.75)	0.190
Daily Heroin Injection [e]				
Yes vs. No	**3.36 (2.10 – 5.38)**	**< 0.001**	**1.95 (1.17 – 3.27)**	**0.011**
Daily Crack Cocaine Smoking [e]				
Yes vs. No	**3.19 (2.26 – 4.49)**	**< 0.001**	**2.17 (1.49 – 3.14)**	**<.001**
Overdose (non-fatal)* [e]				
Yes vs. No	**3.92 (1.13 – 20.98)**	**0.020**	2.04 (0.55 – 7.61)	0.288
Encounters with Police [d]				
Yes vs. No	**2.50 (1.64 – 3.81)**	**<0.001**	**1.69 (1.07 – 2.68)**	**0.025**
Victim of Violence [e]				
Yes vs. No	**1.78 (1.12 – 2.80)**	**0.013**	1.52 (0.92 – 2.51)	0.100
Sex Trade [e]				
Yes vs. No	**2.18 (1.26 – 3.75)**	**0.004**	1.30 (0.72 – 2.38)	0.386
Drug Dealing [e]				
Yes vs. No	**2.74 (1.87 – 4.01)**	**<0.001**	**1.61 (1.06 – 2.47)**	**0.027**

Note: [a] Public areas included: city streets, parks, public washrooms, parking lots, clubs or bars, and abandon buildings; [b]OR = Odds Ratio, CI = Confidence Interval; AOR = Adjusted Odds Ratio; [e]Denotes activities or situations referring to previous 6 months; [d] Denotes activities or situations referring to previous month.

*p-value and 95% CI reported from Fisher's Exact Test as 25% of cells had expected counts less than 5.

Table 7.3 Characteristics of crack cocaine smokers who use drugs in public stratified by willingness to use a supervised inhalation room (n=382)

	Willing to use SIR [a]	
Characteristic	**Yes** *n*= 271, *n* (%)	**No** *n*= 111, *n* (%)
Age pre year older		
(Median, IQR) [c]	43 (37-49)	44 (37-48)
Female Gender		
Yes	117 (43)	28 (25)
No	154 (57)	83 (75)
Aboriginal Ancestry		
Yes	108 (40)	29 (26)
No	163 (60)	82 (74)
Limited Access to Private Space [e]		
Yes	230 (85)	86 (77)
No	41 (15)	25 (23)
Drug Scene Exposure [e, f]		
Yes	157 (58)	49 (44)
No	114 (42)	62 (56)
Most Drug Use in Public Areas [e]		
Yes	140 (52)	43 (39)
No	131 (48)	68 (61)
Daily Crack Cocaine Smoking [e]		
Yes	164 (61)	56 (50)
No	107 (39)	55 (50)
Risky Pipe Sharing [e]		
Yes	38 (14)	3 (3)
No	233 (86)	108 (97)
Encounters with Police [d]		
Yes	92 (34)	22 (20)
No	179 (66)	89 (80)
Victim of Violence [e]		
Yes	53 (20)	24 (22)
No	218 (80)	87 (78)

Note: [c] IQR= Inter Quartile Range; [d] Denotes activities or situations referring to previous 6 months; [e] Denotes activities or situations referring to previous month; [f] Drug scene exposure was defined as spending an average of 7 or more hours on the street each day in Vancouver's drug use epicenter in the

Table 7.4 Univariate and multivariate analyses of factors associated with willingness to use a supervised inhalation room among participants that smoke crack cocaine and use drugs in public locations [a] (n=382)

	Univariate		Multivariate	
Characteristic	**OR[a] (95% CI)**	***p-value***	**AOR[b] (95% CI)**	***p-value***
Older Age				
Per year older	1.01 (0.98 – 1.04)	0.446		
Gender				
Female vs. Male	**2.25 (1.38 – 3.68)**	**0.001**	**2.11 (1.26 – 3.55)**	**0.005**
Aboriginal Ancestry				
Yes vs. No	**1.87 (1.15 – 3.05)**	**0.011**	1.61 (0.96 – 2.72)	0.072
Limited Access to Private Space [e]				
Yes vs. No	1.63 (0.94 – 2.84)	0.083		
Drug Scene Exposure [e]				
Yes vs. No	**1.74 (1.12 – 2.72)**	**0.014**	1.40 (0.86 – 2.28)	0.181
Most Drug Use in Public Areas [e]				
Yes vs. No	**1.69 (1.08 – 2.65)**	**0.022**	1.39 (0.85 – 2.28)	0.187
Daily Crack Cocaine Smoking [e]				
Yes vs. No	1.51 (0.96 – 2.35)	0.071		
Binge Drug Use [e]				
Yes				
Risky Pipe Sharing* [e]				
Yes vs. No	**5.87 (1.79 – 30.29)**	**< 0.001**	**5.50 (1.63 – 18.56)**	**0.006**
Encounters with Police [d]				
Yes vs. No	**2.08 (1.22 – 3.53)**	**0.006**	**2.09 (1.20 – 3.65)**	**0.010**
Victim of Violence [e]				
Yes vs. No	0.88 (0.51 – 1.52)	0.648		

Note: [a]OR = Odds Ratio, CI = Confidence Interval; [b]AOR = Adjusted Odds Ratio; [e]Denotes activities or situations referring to previous 6 months; [d] Denotes activities or situations referring to previous month. *p-value and 95% CI reported from Fisher's Exact Test as 25% of cells had expected counts less than 5.

CHAPTER 8:

CONCLUSIONS

8.1 Summary of findings

This thesis began with an overview of the problems associated with drug-related street disorder and a review of literature on the impacts of current policy-approaches that have been implemented to address this issue. The results of the literature review suggest that law enforcement based approaches which aim to address street disorder are associated with many unintended harmful consequences and are limited in their effectiveness to sustainably reduce street disorder. The review also suggested that there are a number of interventions with promising signs of effectiveness in reducing engagement in drug-related street disorder. These include low-threshold employment programs, supervised injection facilities and addiction treatment programs. In addition, the review highlighted promising underexplored interventions such as low-threshold supportive housing and supervised inhalation facilities for people who smoke drugs. It concluded that further research should be directed towards identifying innovative interventions to address street disorder as well as assessing the impact that underexplored public health based interventions might have on reducing engagement in street disorder.

The central aims of this thesis were to identify factors that contribute to drug-related street disorder, explore the impacts of drug-related street disorder and assess

potential policy responses to this problem. The first data-driven chapter, Chapter 3, described the health and social impacts of exposure to drug-related street disorder and assessed whether exposure posed public health risks. It found that drug scene exposure was associated in a dose-dependent fashion with multiple markers of vulnerability to harm and adverse health outcomes, including being unstably housed, being a victim of violence, having encounters with police and participating in drug dealing. Drug scene exposure was also associated with higher-intensity drug use, specifically, greater likelihood of injecting cocaine and heroin on a daily basis and smoking crack cocaine daily. The analysis further found that employment and addiction treatment were associated with decreased drug scene exposure. These findings supported the exploration of policy interventions in the areas of housing and employment.

To provide a basis for exploring the potential impacts of different policy interventions to address drug-related street disorder, Chapter 4 sought to assess whether willingness measures could be effective tools for planning public health interventions for injection drug user populations. After comparing prior measures for willingness to use a supervised injection facility with later attendance at the facility once it was established, this analysis found that initial willingness to use a SIF was independently associated with subsequent attendance at Vancouver's SIF, even after adjusting for other determinants of willingness. This suggests that willingness measures are reasonably valid tools for predicting engagement with public health programs among local IDU.

After establishing that willingness measures were appropriate tools to assess a population's potential engagement with specific public health interventions, the relationship between access to private space and time spent socializing in the open drug scene was then examined. This was the first analysis to consider whether a particular intervention (increasing access to private space) might have an influence on street disorder. It also sought to identify factors that might contribute to street disorder. This study found that having limited private space was significantly associated with spending an average of three or more hours per day socializing in the open drug scene among local IDU. This association persisted after adjustment for a range of potential confounding factors, suggesting that limited access to private space may be contributing to one aspect of drug-related street disorder. The majority, 65% of those who had limited access to private space and spend significant time socializing in the open drug scene, reported that they would be willing to relocate away from the open drug scene if they were provided with private space for socializing. When compared to IDU who lived in stable housing, study participants who lived in SROs, shelters or had no fixed address were significantly more likely to socialize in the open drug scene and were significantly more likely to be willing to relocate.

Following the analysis of willingness to relocate socializing, the next area of study assessed engagement in street-based disorderly income generation activities and examined the relationship between providing low-threshold employment opportunities and engaging in disorderly income generation activities. This study found that 48% of

local IDU reported engaging in a disorderly income generation activity in the last six months. The most common activities reported were drug dealing and recycling (which included salvaging and unsanctioned street vending). In a multivariate analysis people who reported engaging in disorderly income generation activities were more likely to smoke crack cocaine on a daily basis and inject cocaine on a daily basis. This population was also more likely to engage in binge drug use, have encounters with police, be a victim of violence, share used syringes and inject drugs in public areas. Conversely, individuals with regular employment were significantly less likely to report engaging in disorderly income generation activities. The study also found that among individuals who engaged in disorderly income generation activities, 47% reported that they would be willing to stop engaging in these activities if they were offered other opportunities for low-threshold employment. Individuals engaged in sex work, drug dealing, binge drug use, or who were recently incarcerated were most interested in ceasing their engagement in disorderly income generation activities.

The next and final analysis sought to characterize public crack cocaine smoking and assess whether a supervised inhalation facility had potential to address street disorder by reducing the prevalence of this behaviour. It found that the majority of crack cocaine smokers reported having smoked drugs in public areas at some point in the last six months. This group was more likely to include higher intensity drug users with respect to heroin injection and crack cocaine smoking, have encounters with the police and be involved in drug dealing. Among these public crack cocaine smokers, 71%

reported being willing to use a supervised inhalation room if one was available. Individuals who reported being willing were more likely to be female, engage in risky pipe sharing and have encounters with the police.

8.2 Unique Contributions

This thesis makes a number of unique contributions that have implications for framing and responding to drug-related street disorder. The literature review of the impacts of policy responses to address drug-related street disorder is the first of its kind to summarize the impacts of policies in this area. By identifying the lack of scientific evidence in support of current approaches to drug-related street disorder, this review underscores the need to identify alternative policy interventions and guided the current thesis studies.

Another unique contribution of this thesis is the demonstration that exposure to drug-related street disorder is associated in a dose-dependent fashion with higher-intensity addiction and markers of vulnerability to adverse health outcomes. Although previous studies have assessed harms associated with activities that generate street disorder,[4, 7, 10, 57, 61] this is the first to suggest that exposure independent of engagement in specific activities is a source of harm for street-based drug users. These finding provide evidence that drug-related street disorder is not just a public order concern but should be considered a public health threat and addressed as such.

The third unique contribution of this thesis is the finding that willingness measures are reasonably good tools for predicting engagement with public health interventions among local IDU populations. Despite the common use of willingness measures to assess the feasibility of public health interventions among drug using populations,[193, 222, 225-230] it appears that no study has assessed whether they are valid measurement tools. This study makes a critical contribution to the overall thesis as it provides a justification for the use of willingness measures to explore potential interventions to address drug-related street disorder.

When taken together, the studies in this thesis represent a unique exploration of the factors that contribute to drug-related street disorder, dangers associated with the phenomenon and potential policy responses. By providing an in-depth understanding of the experiences of street-involved drug users and tailoring potential policy interventions to consider and address the motivations and current circumstances of this population, the policy development approach in this thesis is distinct and something that, to date, has not been widely employed. More specifically, this thesis is the first of its kind to consider and find an association between limited access to private space and socializing in the open drug scene, and it is also the first study to demonstrate that there is a high level of willingness among local IDU to relocate to indoor locations if they were given access to more private indoor space. Increasing assess to private indoor space through the provision of low-threshold supportive housing with safeguards to

manage behaviours associated with active drug use is a novel approach to potentially reduce engagement in activities that generate street disorder.

Similarly, this thesis makes a unique contribution by assessing demand for low-threshold employment as a means to reduce engagement in street-based disorderly income generation activities. Given that roughly half of the sample who engaged in disorderly income generation were willing to cease if given other income generation opportunities, this work demonstrates that there is considerable demand for low-threshold employment and increasing these opportunities has potential to reduce engagement in drug-related street disorder.

Lastly, this thesis is the first known study to examine the specific risks associated with smoking crack cocaine in public areas and to assess willingness to use an inhalation facility among public crack cocaine smokers exclusively. Notably, one of the common features this study identified among both public crack cocaine smokers and those who were willing to use a supervised inhalation facility was their elevated likelihood of recently having encounters with law enforcement. This finding indicates that a supervised inhalation facility may be an important tool for police in the management of street disorder.

8.3 Recommendations and Implications

The findings of this thesis highlight that social, structural and environmental factors play a central role in shaping the behaviour of people who use illicit drugs and

are potentially critical levers for policy interventions. This reinforces the view that street disorder should be seen in the context of current political, economic and social conditions and should not be solely constructed as the product of the individual behaviour of street-involved people. Current policy approaches that place primary responsibility on individual-level factors without considering the influence that social, structural and environmental factors have in generating street disorder will continue to be inadequate responses that fail to meet their policy objectives and will continue to simultaneously undermine the health of vulnerable populations. Conversely, this thesis contributes to a growing body of research which indicates that interventions that alter the structure of street-based drug scenes have concrete potential to reduce risk behaviours. This has both micro and macro level implications.

8.3.1 Micro Level Recommendations and Implications

The studies presented in this thesis illustrate that structural factors, including having limited access to private space and a lack of income generation opportunities, are closely connected with street disorder. By addressing aspects of these structural conditions, this thesis has identified three interventions that have potential to successfully engage a large proportion of street-based drug users and create environments that enable them to reduce their engagement in behaviours that generate drug-related street disorder. Specifically, study findings provide compelling evidence that investing in: a) low-threshold supportive housing, b) the creation of low-threshold employment opportunities, and c) the establishment of medically supervised inhalation

facilities can influence the structure of street-based drug scenes and support individuals to modify their behaviour in ways that reduce engagement in street disorder. Supporting and pursuing these policy interventions represents a significant paradigm change for policy-makers in this area as it involves moving away from punitive law enforcement based approaches that attribute chief responsibility for street disorder to individuals.

It is important to note that the benefits of the interventions explored in this thesis are not restricted to the simple reduction of drug-related street disorder but also include important health benefits for vulnerable drug user populations. There is a vast scientific literature documenting the many advantages that supportive housing offers vulnerable populations.[251, 252, 254, 261, 262] Employment is similarly linked with a broad range of social and health benefits,[170, 172, 173] and the opportunities supervised drug consumption facilities create for health care providers to engage with high risk drug using populations and link them with health and social services are also well documented.[21] Based on the findings of this thesis and existing public health research, it is evident that the foundation of our approach to drug-related street disorder should involve implementing interventions that both promote public health objectives and support a reduction in drug-related street disorder by altering structural factors that shape the behaviour of street-based drug users.

8.3.2 Macro Level Recommendations and Implications

At the macro level, this thesis is consistent with the growing recognition of the need for a paradigm shift in all areas of illicit drug policy.[292-296] The evidence linking the criminalization of illicit drug users with the HIV epidemic and a wide range of other devastating health and social harms is now expansive.[71, 113, 292, 296, 297] Recognizing that law enforcement approaches have failed to control problematic drug use and are currently resulting in substantial harms, leading scientists in the areas of public health and public policy have come together and formed a consensus statement on the need to move away from the criminalization of illicit drug users.[293] This position is articulated in the Vienna Declaration, which was the official declaration of the International AIDS Society Conference in 2010, and supports a policy refocus towards the adoption of science-based drug policies that do not undermine public health.[298] This policy reorientation is analogous to what will be required to successfully respond to drug-related street disorder.

A policy reorientation towards evidence-based interventions, whether it be specific to drug-related street disorder or drug policy more generally, will require extensive policy monitoring and evaluation and significant changes in the allocation of drug policy funding. Drug policy funding must be directed towards evidence-based policies while interventions that have been shown to be harmful and ineffective should no longer receive public support. More specifically, consideration must be given to the individual, community and global-level impacts of policy interventions, and the

potential harms and unintended consequences of policy decisions must be integrated into the evaluation of policies and central in funding allocation decisions. Making public health a cornerstone of drug policy development and evaluation may help to ensure that serious negative public health impacts are not overlooked.

8.4 Future Research

The management of drug-related street disorder will benefit from further research in a number of areas. Firstly, although this thesis provides compelling evidence to pursue three types of policy interventions, establishing an evidence-base for other underexplored innovative interventions that meet both public health and public order objectives would be beneficial. The risk environment framework suggests that there are policy levers in the physical, social, economic and policy environments at both the micro and macro level. Identifying and evaluating the impact of interventions in all these areas on drug-related street disorder would increase the potential policy tools available to respond to street disorder and improve outcomes in this area. At the physical micro-environmental level, randomized control trials offer important opportunities to evaluate the impacts of novel housing interventions, as do observational studies of the impact of supervised drug consumption facilities on a range of outcomes, including drug-related street disorder. At the social micro-environmental level there are opportunities to implement and evaluate the potential for peer-based interventions to support reductions in engagement in drug-related street

disorder. Creating training programs for police to educate them about the harmful impacts associated with law enforcement based approaches is another type of social micro-environmental intervention that might have an impact on drug-related street disorder and should be the subject of further process and outcome evaluation. At the macro level, social interventions that warrant exploration include using the media and social marketing to educate the public about factors that contribute to drug-related street disorder and the importance of implemented responses that address both public health and public order objectives.

Further studies could also be conducted to evaluate the potential for policy level macro-environmental interventions to address drug-related street disorder. In particular, studying how reforming laws and policies that govern drug use might impact drug-related street disorder and associated harms appears to be a particularly important area for further research. Similarly, ecological studies examining associations between drug policy funding allocation and drug policy outcomes would contribute to our understanding of how we might better manage drug-related street disorder.

Another important area of further research is to identify complementary interventions and the potential for synergies among multiple interventions to address street disorder. For instance, integrating micro and macro level interventions or combining multiple interventions in any one level or area may create a multiplicative effect that could maximize the impacts of policy responses. It would be equally

important to determine if certain conditions are required in order for some types of interventions to be effective. For instance, initiating police and public health partnerships that educate police about the dynamics of street disorder and the health harms resulting from policing practices in this area may create a desire among police to change how they respond to individuals who are generating street disorder. However, if alternative mechanisms to manage street disorder are not simultaneously implemented police may be unable to modify their practices. Similarly, establishing a supervised inhalation facility may provide alternative locations for street-based drug users to consume drugs; however, if local police are not supportive of the intervention, street-based drug users may not feel safe visiting the facility and the potential benefits of the intervention could be lost. Conversely, if a supervised inhalation facility was implemented in conjunction with efforts to build police and public health partnerships, the two interventions could complement and support each other and their combined benefits could be larger than their individual contributions. Identifying where these complementary relationships between interventions exist and factors that are required to support potential interventions is a key area for future research

In addition, once additional interventions are identified, further research to develop and evaluate the impacts of different intervention models on specific sub-populations of illicit drug users (e.g., female drug users and Aboriginal people who use drugs) could help tailor interventions to meet the needs of particularly vulnerable street-involved drug users and should be another area for future research.

8.5 Conclusions

This thesis has shown that drug-related street disorder is a serious policy problem with public health implications for street-based drug users. Research to date indicates that current policy responses to street disorder have been dominated by law enforcement based approaches that are associated with a range of negative unintended consequences.[270] The evidence emerging from this thesis suggests that there is a high degree of willingness among local IDU to reduce engagement in drug-related street disorder if given other options in the areas of housing, employment and drug consumption locations. Specifically, 65% of participants that reported socializing in the open drug scene were willing to relocate if given access to more private space; 47% of participants who engaged in disorderly income generation activities were willing to forgo those income sources if given low-threshold employment; and 71% of participants who reported smoking crack cocaine in public areas were willing to use a supervised inhalation facility. Together these findings provide strong evidence to suggest that structural and environmental interventions, consistent with the risk environment framework, could have a significant positive impact on the reduction of drug-related street disorder.

In sum, street disorder remains a significant and under-addressed problem with far-reaching implications for public health and public order. However, the data presented herein reveal that novel solutions that simultaneously address public health and public order challenges arising from street disorder are within reach. If decisive

efforts are made by policy-makers to shift the focus of our approach to drug-related street disorder towards these evidence-based interventions we can expect to see significant improvements in the health and social conditions of street-involved drug users, as well as meaningful and lasting reductions in drug-related street disorder.

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