Published in final edited form as:
Soc Sci Med. 2013 January ; 76(1): 126–133. doi:10.1016/j.socscimed.2012.10.015.

The impact of social, structural and physical environmental factors on transitions into employment among people who inject drugs

Lindsey Richardson, MPhil[a,b], **Evan Wood, MD, PhD**[b,c], and **Thomas Kerr, PhD**[b,c]
[a]Oxford University, United Kingdom

[b]British Columbia Centre for Excellence in HIV/AIDS, St. Paul's Hospital, Vancouver, Canada

[c]University of British Columbia, Vancouver, Canada

Abstract

Despite growing awareness of the importance of context for the health of people who use drugs, studies examining labour market outcomes have rarely considered the role that physical, social and structural factors play in shaping labour market participation among drug users. Using discrete time event history analyses, we assessed associations between high-intensity substance use, individual drug use-related risk and features of inner-city drug use scenes with transitions into regular employment. Data were derived from a community-recruited cohort of people who inject drugs in Vancouver, Canada (n=1579) spanning the period of May 1996 to May 2005. Results demonstrate that systematic socio-demographic differences in labour market outcomes in this context generally correspond to dimensions of demographic disadvantage. Additionally, in initial analyses, high-intensity substance use is negatively associated with transitions into employment. However, this negative association loses significance when indicators measuring exposure to physical, social and structural features of the broader risk environment are considered. These findings indicate that interventions designed to improve employment outcomes among drug users should address these social, structural and physical components of the risk environment as well as promote the cessation of drug use.

Keywords

Canada; drug use; employment; risk environment; Vancouver

Introduction

The consumption of psychoactive substances is often considered to be incompatible with or to have a highly negative impact on employment. Injection drug users (IDUs) have often been categorized as either unable or unwilling to participate in conventional social and economic activity (Platt, 1995). Prior research on work and health has documented that work- and non-work-related morbidity and mortality are higher among socio-

Corresponding Author: Thomas Kerr, PhD BC Centre for Excellence in HIV/AIDS 608-1081 Burrard Street, Vancouver, B.C., Canada V6Z 1Y6 **Tel**: (604) 806-9116 **Fax**: (604) 806-9044 uhri-tk@cfenet.ubc.ca.

demographically and socio-economically disadvantaged populations (Bambra, 2011; Morris et al., 1994). Given this relationship, there is a need for research that examines employment patterns among IDUs, who often face considerable obstacles to labour market involvement (Richardson et al., 2012). Exploring influences on labour market engagement may increase understandings of the barriers to employment and those factors that contribute to material deprivation among this highly vulnerable population.

Functionalist theories of drug use, such as strain (Cloward & Ohlin, 1960; Merton, 1938), control (Hirschi, 1969) and differential association theory (Akers et al., 1979; Groves & Sampson, 1987; Sutherland, 1947) characterize drug use as symptomatic of a general retreat from culturally ascribed goals, social controls or conventional institutions. These theories generally anticipate a concurrent tendency towards both substance use and non-employment. Whether through economically structured disconnections between culturally enshrined aspirations and socially approved opportunities (as in the case of strain theory), a lack of strong ties to the workplace (as theorised by control theory), or socially reinforced non-participation in the labour market (described by differential association theory; Shaw, 2002), these deviance-oriented perspectives characterize non-employment and substance use as emergent by-products of the material, social or institutional aspects of social disorganization.

Empirical evidence that confirms, contradicts, or builds upon the theoretical accounts described above may have implications for subsequent explorations of the relationship between substance use and employment. In North America, endemic drug use and acquisitive crime in areas of high unemployment have been connected to the absence of adequate, licit economic opportunities and to the consequences of economic and social service restructuring. This restructuring has been away from both manual work and rehabilitative social service provision (Bourgois & Schonberg, 2009; Draus et al., 2010; Johnson et al., 1985; Pearson, 1987). Other studies suggest that high-intensity drug use does not preclude employment (Harling, 2007; Zimmerman & Wieder, 1977; Zinberg, 1984). Draus (2010), identifies three conceptions of the working drug user: the “stabilized junkie” (Faupel, 1987), who engages in daily heroin use but still maintains reasonably predictable routines; the working addict (Caplovitz, 1976), who maintains work-related behaviour similar to that of the non-using population and whose use fluctuates according to levels of income; and the controlled user (Harling, 2007; Zinberg, 1984), whose use is self-regulated and who remains high-functioning. Much of this research observes the presence of routines that structure daily life, value commitments outside of drug use, and drug-use rituals that permit concurrent employment (Caplovitz, 1976; Pearson, 1987; Zinberg, 1984; Faupel 1987). Further, ethnographic studies have demonstrated organizational skill, forward planning and relationship development among drug users (Bourgois & Schonberg, 2009; Draus et al., 2010; Feldman, 1968; Johnson et al., 1985). These studies have drawn attention to the role of environmental conditions in shaping the character of income generating activity. They importantly suggest that understandings of the relationship between drug use and economic activity depend on considerations of the broader context within which drug users live and operate.

Consideration of this broader context is notably absent from much research on the relationship between drug use and work and has, to our knowledge, not yet been addressed by quantitative study. Adopting hypotheses consistent with functionalist characterizations of substance use – that illicit drug use and labour market outcomes will be inversely related – the results across studies using large, often nationally representative samples are equivocal. Results indicate negative associations between drug use and job stability and the probability of being in employment, and a positive association with time spent in unemployment (DeSimone, 2002; Kandel & Davies, 1990; Kandel & Yamaguchi, 1987; Kandel et al.,

1995). Conversely, other research shows that employment outcomes are not systematically worse with higher levels of use (Zarkin et al., 1998) or with the use of `hard' compared to `soft' drugs (Gill & Michaels, 1991). While differentiating between the use of different substances (DeSimone, 2002) and low- versus high-intensity patterns of use (Bray et al., 2000; French et al., 2001) may help clarify results, conclusions elsewhere maintain that these studies fail to produce evidence of a robust labour supply-drug use relationship (Kaestner, 1998). This ambiguity may be attributable to a lack of consideration of the broader social, structural and physical environment.

A select number of studies compare the characteristics of employed and unemployed drug users using data from community and street-recruited samples (Alexandre & French, 2004; Atkinson et al., 2000; Koo et al., 2007; McCoy et al., 2007). These analyses provide opportunities to situate explorations of labour market outcomes within drug use contexts. They may therefore be crucial to more detailed understandings of environmental influences on localized patterns of income generation among people who use drugs. However, to our awareness, few if any of these studies have utilized long-term longitudinal data, nor have they considered the broader risk environment of IDUs.

An emerging body of research has reinforced the important role that drug use scenes, as distinct risk environments, play in shaping the health and risk trajectories of drug users (Curtis & Wendel, 2000; Hough & Natarajan, 2000; Kerr et al., 2007). Drug scenes have been described as specific geographical inner-city areas characterized by high concentrations of drug users and drug dealing (Curtis & Wendel, 2000; Hough & Natarajan, 2000). These geographic areas host elaborate socio-spatial networks within which are further embedded the practices associated with the day-to-day realities of securing basic necessities such as money, shelter, and drugs (Bourgois, 1996; Fast et al., 2010; Maher, 1997). Evidence has recently begun to highlight how drug-use milieus operate to isolate and push individuals towards harm (Bourgois, 1998; Fast et al., 2009; Lovell, 2002; Mayock, 2002; Small et al., 2006), evoking a more nuanced version of the structural determinism of earlier functionalist accounts.

The potential relevance of these milieus to the income generating practices of drug users raises the issue of how to conceptualize these contexts in analyses of drug-related harm. The heuristic offered by Rhodes' (2002; 2009) Risk Environment Framework offers one such characterization. It accounts for the interplay of physical, social, economic and policy components that impact the production and reproduction of drug harms at the micro-, meso- and macro-environmental level. Goldenberg (2011) importantly identifies that the purpose of the framework is not to provide a comprehensive categorization and labeling system for what are impossibly complex relationships between multifaceted and multilevel aspects of the broader risk environment. It instead serves to facilitate an explicit recognition and identification of environmental influences on health and risk.

The use of an analytical heuristic such as the Risk Environment Framework may be crucially important to an understanding of how contextual features influence the relationship between drug use and income generation in quantitative study. We therefore incorporate the Risk Environment Framework into an examination of the relationship between labour market participation and drug use among a long-term community-recruited cohort of IDU in Vancouver, Canada. In keeping with previous studies (Richardson et al., 2010), we account for individual characteristics, different substances and specific patterns of use. In an effort to identify aspects of the risk environment that are consequential to labour market outcomes, we include select variables measuring the social, structural and physical features specific to a local drug scene. Analyses are designed to isolate the specific role of exposure to features of the broader risk environment in employment entries. We test the general hypothesis that

immersion in the local drug scene and associated exposure to increased vulnerability and risk across individual attributes, drug use patterns, drug-related events or practices and contextual features will be negatively associated with labour market outcomes.

Data and Methods

Relationships with the labour market may involve processes related to labour market entry, transitions into work, employment maintenance, job transitions, job losses and labour market exits. In contrast to previous work using a coarser indicator of employment (Richardson et al., 2010), here we isolate a specific aspect of the labour market relationship - transitions from non-employment into regular employment -using data from the Vancouver Injection Drug User Study (VIDUS).

Sampling and Recruitment

Described in detail elsewhere (Wood et al., 2001), VIDUS is a longstanding community-recruited cohort study, designed with a view to understand the dynamics of HIV-related risk among people who inject drugs in Vancouver, Canada (Wood et al., 2001). Individuals were eligible for the study if, at the time of recruitment, they reported illegal drug injection in the previous month, resided in greater Vancouver and provided informed written consent. Beginning in May 1996, at baseline and semi-annually thereafter, participants completed detailed questionnaires that gathered socio-demographic, drug use, income generation, risk- and environmental exposure-related information. At each follow up, participants also provided blood samples for serological testing for HIV and hepatitis C (HCV). Participants are provided with a stipend ($20 CAD) at each study visit. The study was approved by the University of British Columbia/Providence Health Care Research Ethics Board.

Measures and Analytic Plan

The current analyses use baseline and all available VIDUS follow up observations from 1579 participants who were enrolled in the study from May 1996 to May 2005. Respondents were asked, “In the past six months, what have been your sources of income?” A respondent was considered to have undergone an employment transition, the main outcome of interest, if one of their income sources in the six months prior to interview was a regular job or business, and if in the previous follow up they did not indicate income from a regular job or business. Having income from a regular job was distinguished from other sources of income by response options for temporary, casual, government provided and non-legal forms of income generating activity. All observations that were a part of employment spells initially measured at baseline interviews were excluded from analyses to avoid incorrectly assuming that self-reported employment at baseline marked an actual transition out of non-employment.

We constructed models using multivariate discrete-time event history analysis (Allison, 1982; Beck et al., 1998; Jenkins, 1995), which models time to the occurrence of an event (here an employment transition), conditional on those variables that may influence the probability of the specified event occurring. These methods are similar to Cox regression models for recurrent events, but are an appropriate adaptation when data record the interval of time in which each event occurs rather than the precise date (Alison, 1982). These models were adjusted to incorporate both time varying covariates and repeated failures, as many study participants experienced multiple transitions in and out of employment over the study period. Longitudinal observations are correlated both over time and within individuals. We therefore account for serial correlation between observations through the inclusion of a series of dummy variables, $\tau(j)$, corresponding to the duration an individual is not in employment (Allison, 1982; Beck et al., 1998). Time dummies have a value of 1 if a spell of

non-employment has lasted *j* observations. The first of these, $\tau 0$, corresponds to the first observation in which an individual reports non-employment and when a spell comes to an end by means of a transition into employment, the count is reset back to $\tau 0$. Further accounting for serial and unit correlation is achieved in three ways. First, we control for correlations between multiple employment transitions made by the same participant by including a count of the number of previous transitions included as a covariate. This variable is coded zero until after the first transition to employment, when it becomes one, one until after the second transition to employment when it becomes two, and so on. Second, we include the alternate time scale of age. Third, we adjust standard errors to account for clustered observations at the level of the individual (Williams, 2000).

As a first step, we examined descriptive statistics of the study sample. We stratified individuals by whether or not they report an employment transition over the course of the study period, and assessed differences at baseline between those who report an employment transition and those who do not across individual level socio-demographic characteristics and indicators of drug use, HIV and HCV serostatus and drug use-related risk behaviour.

We then built a series of nested models. In the first model, covariates included the individual level variables of a previous job transition, age (in years), female gender (yes vs. no), Aboriginal ancestry (yes vs. no), marital status (married/common law relationship vs. other), and educational attainment (≥ high school vs. < high school). Also included were measures of high-intensity drug use, including frequent heroin injection (≥ daily vs. < daily), cocaine injection (≥ daily vs. < daily), speedball injection (≥ daily vs. < daily) and crack use (≥ daily vs. < daily). A second model adds binary covariates that operationalize individual level drug-related risk behaviour that may plausibly be related to labour market participation. These include binge drug use, measured as self-reported higher than average drug use, and non-fatal overdose. Covariates take on a value of 1 in the presence of a given practice or event in the six months prior to interview, and 0 otherwise.

The final model adds six additional binary covariates that seek to capture some of the social, structural and environmental elements of the broader risk environment in Vancouver's drug use scene. They include exposure to public injecting scenes, indicated, in keeping with prior studies, by a self-report of injecting in a public place such as a street, public lavatory, alley, park, parking lot, or other public setting (DeBeck et al., 2009), as well as shooting gallery attendance. Both of these have been associated with embedded physical, social and increased HIV-related risk in this context and elsewhere (Rhodes et al., 2006; Small et al., 2007). Also included are exposure to unstable housing environments at the time of interview, defined here as living in a hotel, hostel, jail or prison, or being homeless (Wood et al., 2001); and residency in the Downtown Eastside (DTES), Vancouver's HIV infection and drug use epicenter, which implies exposure to various social and structural elements such as relative economic deprivation (Smith, 2003). The final analysis further accounts for sex work involvement, defined, as in prior study, as self-reported exchange of sex for money, goods, drugs, shelter or anything else (Kuyper et al., 2004; Wood et al., 2007). Sex work is implicated in exposure to social and structural violence and environment-specific harm (Shannon et al., 2008; Shannon et al., 2009). Finally recent incarceration is included as an additional environmental exposure that is demonstrably associated with significant social and health harms (see Kerr et al., 2005 for a review). Unstable housing, sex work involvement, Downtown Eastside Residency and recent incarceration have previously been associated with socio-economic vulnerability (Beardsley et al., 1992; Pager, 2003; Shannon et al., 2008; Smith, 2003). With the exception of unstable housing, these variables are measured in the six months prior to interview.

Time dummies are suppressed in the reporting of results, a common practice where substantive interest lies more in the effect of covariates than in the effect of duration (Blossfeld et al., 2007; Box-Steffensmeier & Jones, 2004). Finally, given the possibility of multicollinearity, we examined the variance inflation factor (VIF) for the covariates included in each model to assess whether or not estimates and standard errors are adversely affected. VIF values are evaluated relative to a benchmark of 10, commonly considered to be the value at which collinearity becomes an issue for estimates (O'Brien, 2007). Statistical analyses were performed using STATA version 12 (StataCorp, College Station, TX).

Results

Data for the current analysis comes from 1579 individuals enrolled in VIDUS between May 1996 and November 2005, who contributed a total of 14868 observations to the current study. Of these 1579 participants, 1394 (88.3%) reported for at least one follow up after baseline; participants contributed a median of nine observations (interquartile range [IQR] 4–16) over the course of the study period. At recruitment the average age of respondents was 32.6 (IQR: 25.6–40.1), 580 (36.7%) respondents were female and 432 (27.0%) were of Aboriginal ancestry. A total of 787 employment transitions were observed; fully 467 (29.6%) participants reported moving into a regular job at least once, while 1112 (70.4%) did not report any employment transitions over the course of the study. These figures do not include 89 employment spells comprised of 128 observations that were observed beginning at baseline and excluded from analyses as described in the methods section above. Among those that reported employment, the median number of observations in employment was 2 (IQR: 1–4) and the mean number of employment transitions was 1 (IQR: 1–2). Characteristics of the study sample at baseline are described in further detail in Table 1. Notably, statistically significant differences at baseline between those that report an employment transition and those that do not were observed for women ($p<0.001$), those reporting Aboriginal ancestry ($p=0.021$), individuals with less than a high school education ($p<0.001$), participants reporting daily crack use ($p=0.034$), those who are living with HIV ($p<0.001$) or HCV ($p=0.009$), and individuals who report unstable housing ($p<0.001$), who were all disproportionately represented among those respondents who did not report an employment transitions over the course of the study.

Results from the multivariate, discrete-time event history analyses are displayed in Table 2. Hazard ratios report the effect of a given covariate on the hazard of an employment transition. In the first analysis examining the relationship between socio-demographic and drug use covariates on employment transitions, all socio-demographic variables were statistically significant. Previous job transitions (hazard ratio [HR]: 1.85; 95% confidence interval [CI] 1.66–2.06), marital status (HR: 1.44; 95% CI: 1.19–1.73) and educational attainment (HR: 1.48; 95% CI: 1.17–1.87) positively impact the hazard of a transition into employment, while age (HR: 0.96, 95% CI: 0.95–0.97), female gender (HR: 0.48; 95% CI: 0.39–0.59) and Aboriginal ancestry (HR: 0.76, 95% CI: 0.63–0.93) were negatively associated with the outcome of interest. Also negatively associated with employment transitions were measures of high-intensity drug use, including daily heroin injection (HR: 0.64, 95% CI: 0.52–0.78), daily cocaine injection (HR: 0.60, 95% CI: 0.48–0.74); daily speedball injection (HR: 0.55, 95% CI: 0.37 – 0.84) and daily crack use (HR: 0.55, 95% CI: 0.44–0.68). In the second analysis, all socio-demographic and drug use variables retained nearly identical associations with employment transitions in terms of magnitude, direction and significance. Of the covariates added to the model, only binge drug use reached statistical significance (HR: 0.77, 95% CI: 0.63–0.93).

The results from the third model, which adds indicators related to the social, structural and physical aspects of the risk environment, are not consistent with those of the previous two

analyses. Socio-demographic indicators retain similar relationships with the dependent variable, with the exception of marital status, which ceases to be significant. Conversely, the coefficients and standard errors of the drug use variables and binge drug use change considerably. Daily cocaine injection, speedball injection and crack use as well as binge drug use all drop out of significance; daily heroin injection nearly does so as well (HR: 0.79, 95% CI: 0.65–0.97). The coefficients for the six covariates of the social, structural and physical elements considered indicate highly statistically significant and negative relationships with employment transitions. Exposure to public injecting scenes (HR: 0.65, 95% CI: 0.48–0.87), shooting galleries (HR: 0.74, 95% CI: .0.56–0.98), unstable housing (HR: 0.58, 95% CI: 0.48–0.70), as well as DTES residency (HR: 0.46, 95% CI: 0.38–0.56), involvement in sex work (HR: 0.37, 95% CI: 0.26–0.52) and recent incarceration (HR: 0.71, 95% CI: 0.58–0.87) negatively predict moving into a regular job. Identical models were run including those employment spells that began at baseline to test the sensitivity of initial results to their exclusion; coefficients were nearly identical in terms of direction, magnitude and significance (results not shown). The post-estimation examination of the VIF for model covariates suggests that multicollinearity did not impact estimates and standard errors. The mean VIF for the covariates included in Models 1, 2 and 3 were 1.11, 1.11 and 1.20 respectively. No single covariate-specific VIF in any of the models is above 1.42.

Discussion

The current study demonstrates that there is a notable proportion of IDU that engage in labour market activity in the DTES context. Tests of our initial hypothesis – that exposure to vulnerability and risk across individual attributes, drug use patterns, drug-related events or practices and contextual features will be negatively associated with labour market outcomes – were mixed. Outcomes specific to socio-demographic characteristics were consistent with the proposed hypothesis. Discussed in detail elsewhere (Richardson et al., 2010), systematic socio-demographic differences in labour market outcomes among Vancouver area drug users generally correspond to dimensions of demographic disadvantage. Results concerning drug use patterns and drug-related events, however, were not consistent with the stated hypothesis. These indicated that although high-intensity drug use is initially negatively associated with transitions into employment, this negative association is substance specific and contingent on accounting for exposure to select physical, social and structural features of the risk environment. That is, when indicators reflecting these contextual features were considered, only frequent heroin injection retained significance. Finally, the strong negative associations between aspects of the risk environment and employment transitions where highly consistent with the proposed hypothesis. The current study therefore establishes a previously undocumented connection between entries into employment and the social, physical and structural environment, emphasizing the situated nature of important influences on labour market participation among people who inject drugs.

There are differences in the results between the baseline descriptive statistics in Table 1 and the regression results using longitudinal data in Table 2. For example, age, marital status, daily injection heroin use, and shooting gallery attendance at baseline did not significantly differentiate between those that do and do not report an employment transition at a subsequent point in the study period. They did, however, make this differentiation in at least one of the subsequent regression analyses. These differences suggest that initial characteristics or behaviour that might be considered detrimental to social and economic outcomes may not reliably predict outcomes over time, underlining the importance of using time-updated longitudinal data to explore research questions such as that examined here.

The configuration of physical-, social- and dependence-related harm that has been attributed to heroin may offer a potential explanation of why heroin was the sole substance examined

in the current study to retain its negative relationship with employment transitions. For example, heroin has been associated with damage to organs or systems through both immediate and ongoing use (e.g. respiratory failure and endocarditis), the attendant harm of being administered intravenously (such as the spread of blood borne viruses), inducing strong psychological and physical dependence, and elevated social impacts and health care costs. This harm is often considered to be equivalent to or greater than that associated with other psychoactive substances (Nutt, 2007). The findings of the current study are therefore consistent with previous studies identifying heroin as particularly detrimental to social and economic outcomes (Feldman, 1968; Hanson et al., 1985; Johnson et al., 1985).

Notably, the failure of other drug use variables to retain significance is not consistent with aforementioned research that identifies an inverse relationship between labour market outcomes and high-intensity use (Alexandre & French, 2004; Bray et al., 2000; French et al., 2001). Measurement differences exist between drug use in these studies (weekly or more) and the current study (daily or more), making our finding of no association across several substances all the more surprising. Based on these results, quantitative analyses looking at the relationship between drug use and labour market outcomes may benefit from an approach that does not collapse different substances and patterns of use. Alternatively, the differences observed between this and previous studies may be attributable to an absence of contextual considerations. That is, statistically, in initial analyses it may have been confounding features of the risk environment that were being captured by the frequent drug use variables. Accounting for broader contextual and environmental factors may clarify the aforementioned ambiguous results of quantitative studies.

Over and above these unanticipated results, a relatively clear picture emerged regarding individual, drug-related, social, structural and physical aspects of the Vancouver-based drug scene examined here. Gender, Aboriginal ancestry, previous economic success and educational attainment – the latter two of which may also be interpreted as proxy measures of socio-economic status – carry with them the contextual and structural disadvantage (Arber, 1991; Williams et al., 2010) that has been demonstrably associated with the differential expression of drug-related harm (Duff, 2011; Maher, 2004; Measham, 2002; Weinberg, 2011). The current study is no different and suggests that systematic socio-economically deleterious structural disadvantage is embedded within the material, social and institutional aspects of social disorganization referred to earlier in descriptions of functionalist theories of deviance and drug use.

Of particular interest is the delineation between drug-related risk and non-drug related exposure to social, structural and physical features of the Vancouver inner-city drug use scene. Non-fatal overdose and binge drug use were not significantly associated with transitions into employment in the final analysis. This is consistent with previous studies that have found little or no evidence of a significant association between employment and unsafe injection practices (Clatts et al., 2007; Wood et al., 2002). When viewed alongside the predominantly insignificant frequent drug use variables, the importance of considering the broader context to an understanding of the relationship between drug use and labour market outcomes is clear.

In terms of the physical environment, the practice of public injecting has been characterized by unsanitary, hurried injections where the presence of police or street predators increases levels of stress and the probability of unsafe injecting practices (Small et al., 2007). The absence of a safe physical space in which to inject suggests an elevated level of vulnerability. In the case of shooting gallery attendance, prior studies suggest attendance is common among those with dense social networks connected to participation in drug markets and drug use scenes (Klein & Levy, 2003; Latkin et al., 1995). Study participants attending

shooting galleries or injecting publicly may therefore represent a subpopulation of IDUs that is entrenched in the drug use scene. Immersion in these environments can serve to shape the day-to-day experiences and priorities of drug users (Rhodes et al., 2005). For example, in addition to influencing drug use practices, these environments offer prohibited income generating activities commonly assumed by drug users, including drug dealing, scavenging, and sex work (DeBeck et al., 2007). While perhaps not deterministically linked to employment transitions, both public injection and shooting gallery attendance represent physically situated components of the broader risk environment, exposure to which is here associated with labour market detachment.

Finally, all of the remaining social, structural and physical components of the risk environment included in the current analysis appear to have important bearing on the employment outcomes of individual drug users. Unstable housing has previously been shown to create social instability that is inimical to holding a regular job (Beardsley et al., 1992; Suffet, 1999). Similarly, the elevated and concentrated socio-economic disadvantage of the DTES neighbourhood (Smith, 2003) may produce a socio-economic context detrimental to individual labour market opportunities and outcomes (Browning & Cagney, 2002). Further, criminal justice system involvement, highly prevalent in the sample population, is a known barrier to labour market activity (Pager, 2003). In addition to disrupting daily activities, disconnecting an individual from support networks and potentially removing them from an existing job, employers have been shown to systematically discriminate against potential employees on the basis of a criminal record (Holzer, 2007; Pager, 2003). Lastly, the independent association of sex work involvement with transitions into employment may be indicative of a lack of viable income generating options for individuals involved in this type of work (Sherman et al., 2006). The potential implications of labour market involvement for individuals engaged in sex work for health, social and safety-related issues (Blankenship & Koester, 2002; Shannon et al., 2008) are therefore potentially far reaching. The statistical importance of these variables implies that the conditions surrounding drug use play a significant role in prospects for labour market participation. Monolithic portrayals of drug use as deviant behavior or suggestions that drug use has a straightforward, negative effect on labour market outcomes fail to address important social, structural and physical features of the risk environment that shape an individual's relationship with conventional socio-economic activity. While qualitative explorations of income generation have long emphasized context, this emphasis has yet to be featured prominently in quantitative studies of the relationship between drug use and employment.

The current study has a number of limitations. Findings are based on a non-random sample and may not be generalizable to other IDUs. Data used in the study are also based on self-report, and may be subject to recall or social desirability biases. Additionally, analyses do not control for external confounding, and future work may benefit from considerations of unobserved heterogeneity, including local labour market conditions such as unemployment rates. The current study does not examine other aspects of the labour market relationship such as employment tenure, which may have a significant role in reducing risk-related contextual exposures; employment loss, which may exhibit a strong relationship with the broader risk environment; or temporary employment, which, while outside the scope of the current analysis, may represent an entrée into the workforce that leads to subsequent long-term employment. Analyses are also unable to consider individual employment histories prior to the start of the study period. Additionally, the income generation information in the VIDUS does not reliably differentiate between unemployment and labour market inactivity, and, as a result, all individuals are assumed to have the potential to make a transition into employment. The inclusion of individuals who are not seeking or capable of employment may therefore result in the inflation of coefficients corresponding to covariates that may be

disproportionately associated with labour market inactivity. These may all be fruitful areas for future research, as would the results of the current study to explore the utility of constructing an index measuring exposure to the risk environment that could quantify how multiple factors affect employment prospects. Finally, results do not imply direct causal links between a particular covariate and employment transitions, but rather indicate systematically different characteristics and exposures between those individuals who make a transition into employment and those who do not. Key findings are best understood with this caveat in mind.

For IDUs, employment initiation appears to be highly contingent upon exposure to or engagement with the social, structural and physical features of the drug use context. It is not so much drug use, but drug use in the presence of these social, structural and physical aspects of the broader risk environment by individuals who are structurally vulnerable in particular ways that appears to be consequential for employment transitions among this population. Rather than attribute suboptimal employment outcomes to drug use alone, any analysis looking at the relationship between drug use and labour market outcomes should also examine broader contextual and environmental factors that may impact or mediate the drug use-labour market relationship. These findings may have particular policy implications for those interventions that are aimed at socio-economic integration. Any initiative geared toward increasing the labour market participation of IDUs will need to consider the complex relationship between drug use, the individual and the broader environmental context. Rather than focus uniquely on drug use cessation or abstinence, addressing the risk environment of people who use drugs through social and structural interventions may be important priorities for facilitating sustained labour market participation.

Acknowledgments

The authors thank the study participants for their contribution to the research, as well as current and past researchers and staff. We would specifically like to thank Deborah Graham, Peter Vann, Caitlin Johnston, Steve Kain, and Calvin Lai for their research and administrative assistance. The study was supported by the US National Institutes of Health (R01DA011591). This research was undertaken, in part, thanks to funding from the Canada Research Chairs program through a Tier 1 Canada Research Chair in Inner City Medicine, which supports Dr. Evan Wood. At the time of writing, Lindsey Richardson was supported by doctoral awards from the Pierre Elliott Trudeau Foundation and the Social Sciences and Humanities Research Council of Canada. Thomas Kerr is supported by the Michael Smith Foundation.

References

Akers RL, Krohn MD, Lanza-Kaduce L, Radosevich M. Social learning and deviant behavior: A specific test of a general theory. American Sociological Review. 1979; 44(4):636–655. [PubMed: 389120]

Alexandre PK, French MT. Further evidence on the labor market effects of addiction: Chronic drug use and employment in metropolitan Miami. Contemporary Economic Policy. 2004; 22(3):382–393.

Allison PD. Discrete-time methods for the analysis of event histories. Sociological Methodology. 1982; 13:61–98.

Arber S. Class, paid employment and family roles: Making sense of structural disadvantage, gender and health status. Social Science & Medicine. 1991; 32(4):425–436. [PubMed: 2024158]

Atkinson JS, Montoya ID, Trevino RA, Richard AJ. Labor force participation in a sample of substance users. American Journal of Drug and Alcohol Abuse. 2000; 26(3):355–367. [PubMed: 10976662]

Bambra C. Work, worklessness and the political economy of health inequalities. Journal of Epidemiology and Community Health. 2011; 65(9):746–750. [PubMed: 21282147]

Beardsley M, Clatts MC, Deren S, Davis WR. Homelessness and HIV-risk behaviors in a sample of New York City drug injectors. AIDS and Public Policy Journal. 1992; 7(3):162–169.

Beck N, Katz JN, Tucker R. Taking time seriously: Time-Series-Cross-Section analysis with a binary dependent variable. American Journal of Political Science. 1998; 42(4):1260–1288.

Blankenship KM, Koester S. Criminal law, policing policy, and HIV risk in female street sex workers and injection drug users. Journal of Law, Medicine & Ethics. 2002; 30(4):548–559.

Blossfeld, HP.; Golsch, K.; Rohwer, G. Event history analysis with STATA. Lawrence Erlbaum Associates; Mahwah, NJ: 2007.

Bourgois, P. In search of respect: Selling crack in El Barrio. Cambridge University Press; Cambridge: 1996.

Bourgois P. The moral economies of homeless heroin addicts: Confronting ethnography, HIV risk, and everyday violence in San Francisco shooting encampments. Substance Use & Misuse. 1998; 33(11):2323–2351. [PubMed: 9758016]

Bourgois, P.; Schonberg, J. Righteous Dopefiend. University of California Press; Berkeley: 2009.

Box-Steffensmeier, JM.; Jones, BS. Event history modeling: A guide for social scientists. Cambridge University Press; Cambridge: 2004.

Bray JW, Zarkin GA, Dennis ML, French MT. Symptoms of dependence, multiple substance use, and labor market outcomes. American Journal of Drug and Alcohol Abuse. 2000; 26(1):77–95. [PubMed: 10718165]

Browning CR, Cagney KA. Neighborhood structural disadvantage, collective efficacy, and self-rated physical health in an urban setting. Journal of Health and Social Behavior. 2002; 43(4):383–399. [PubMed: 12664672]

Caplovitz D. The working addict. International Journal of Sociology. 1976; 6(4):1–136.

Clatts MC, Giang LM, Goldsamt LA, Yi H. Novel heroin injection practices: Implications for transmission of HIV and other blood borne pathogens. American Journal of Preventive Medicine. 2007; 32(6S):S226–S233. [PubMed: 17543715]

Cloward, RA.; Ohlin, LE. Delinquency and opportunity: A theory of delinquent gangs. Routledge & Kegan Paul; London: 1960.

Curtis, R.; Wendel, T. Toward the development of a typology of illegal drug markets. In: Natarajan, M.; Hough, M., editors. Illegal drug markets: From research to policy. Criminal Justice Press; Monsey, NJ: 2000.

DeBeck K, Shannon K, Wood E, Li K, Montaner J, Kerr T. Income generating activities of people who inject drugs. Drug and Alcohol Dependence. 2007; 91:50–56. [PubMed: 17561355]

DeBeck K, Small W, Wood E, Li K, Montaner J, Kerr T. Public injecting among a cohort of injecting drug users in Vancouver, Canada. Journal of Epidemiology and Community Health. 2009; 63(1): 81–86. [PubMed: 18628270]

DeSimone J. Illegal drug use and employment. Journal of Labor Economics. 2002; 20(4):952–977.

Draus PJ, Roddy J, Greenwald M. “I always kept a job”: Income generation, heroin use and economic uncertainty in the 21st century Detroit. Journal of Drug Issues. 2010; 40(4):841–869.

Duff C. Reassembling (social) contexts: New directions for a sociology of drugs. International Journal of Drug Policy. 2011; 22(6):404–406. [PubMed: 22056289]

Fast D, Shoveller J, Shannon K, Kerr T. Safety and danger in downtown Vancouver: Understandings of place among young people entrenched in an urban drug scene. Health & Place. 2010; 16(1):51–60. [PubMed: 19733496]

Fast D, Small W, Wood E, Kerr T. Coming 'down here': Young people's reflections on becoming entrenched in a local drug scene. Social Science & Medicine. 2009; 69(8):1204–1210. [PubMed: 19700232]

Faupel CE. Drug availability, life structure, and situational ethics of heroin addicts. Journal of Contemporary Ethnography. 1987; 15(3–4):395–419.

Feldman HW. Ideological supports to becoming and remaining a heroin addict. Journal of Health and Social Behavior. 1968; 9(2):131–139. [PubMed: 5745769]

French MT, Roebuck MC, Alexandre PK. Illicit drug use, employment, and labor force participation. Southern Economic Journal. 2001; 68(2):349–368.

Gill AM, Michaels RJ. Does drug use lower wages? Industrial & Labour Relations Review. 1991; 45(3):419–434.

Goldenberg SM, Strathdee SA, Gallardo M, Nguyen L, Lozada R, Semple SJ, Patterson TL. How important are venue-based HIV risks among male clients of female sex workers? A mixed

methods analysis of the risk environment in nightlife venues in Tijuana, Mexico. Health & Place. 2011; 17(3):748–756. [PubMed: 21396875]

Groves WB, Sampson RJ. Traditional contributions to radical criminology. Journal of Research in Crime and Delinquency. 1987; 24(3):181–214.

Hanson, B.; Beschner, G.; Walters, JM.; Bovelle, E. Life with heroin: Voices from the inner city. Free Press; Lexington: 1985.

Harling MR. The place and meaning of `controlled', illicit substance use in the private lives of a group of individuals. Journal of Substance Use. 2007; 12(1):1–12.

Hirschi, T. Causes of delinquency. University of California Press; Berkeley: 1969.

Holzer, H. Collateral costs: The effects of incarceration on the employment and earnings of young workers. IZA Discussion Paper No 3118. 2007. Available at: www.ssrn.com/abstract=1031709

Hough, M.; Natarajan, M. Introduction: Illegal drug markets, research and policy. In: Hough, M.; Natarajan, M., editors. Illegal drug markets: From research to policy. Criminal Justice Press; Mosey, NJ: 2000.

Jenkins SP. Easy estimation methods for discrete-time duration models. Oxford Bulletin of Economics and Statistics. 1995; 57(1):129–136.

Johnson, BD.; Goldstein, PJ.; Preble, E.; Schmeidler, J.; Lipton, DS.; Spunt, B.; Miller, T. Taking care of business: The economics of crime by heroin abusers. Lexington Books; Lexington, MA: 1985.

Kaestner R. Illicit drug use and labor market outcomes: A review of economic theory and its empirical implications. Journal of Drug Issues. 1998; 28(3):663–680.

Kandel D, Chen K, Gill A. The impact of drug use on earnings: A life-span perspective. Social Forces. 1995; 74(1):243–270.

Kandel DB, Davies M. Labor force experiences of a national sample of young adult men: The role of drug involvement. Youth and Society. 1990; 21(4):411–445.

Kandel DB, Yamaguchi K. Job mobility and drug use: An event history analysis. American Journal of Sociology. 1987; 92(4):836–878.

Kerr T, Kimber J, Rhodes T. Drug use settings: An emerging focus for research and intervention. International Journal of Drug Policy. 2007; 18(1):1–4. [PubMed: 17689337]

Kerr T, Small W, Wood E. The public health and social impacts of drug market enforcement: A review of the evidence. International Journal of Drug Policy. 2005; 16(4):210–220.

Klein H, Levy JA. Shooting gallery users and HIV risk. Journal of Drug Issues. 2003; 33(3):751–767.

Koo DJ, Chitwood DD, Sánchez J. Factors for employment: A case-control study of fully employed and unemployed heroin users. Substance Use & Misuse. 2007; 42(7):1035–1054. [PubMed: 17668324]

Kuyper LM, Lampinen TM, Li K, Spittal PM, Hogg RS, Schechter MT, Wood E. Factors associated with sex trade involvement among male participants in a prospective study of injection drug users. Sexually Transmitted Infections. 2004; 80:531–535. [PubMed: 15572630]

Latkin C, Mandell W, Oziemkowska M, Celentano D, Vlahov D, Ensminger M, Knowlton A. Using social network analysis to study patterns of drug use among urban drug users at high risk for HIV/AIDS. Drug and Alcohol Dependence. 1995; 38(1):1–9. [PubMed: 7648991]

Lovell AM. Risking risk: The influence of types of capital and social networks on the injection practices of drug users. Social Science & Medicine. 2002; 55(5):803–821. [PubMed: 12190272]

Maher, L. Sexed work: Gender, race and resistance in a Brooklyn drug market. Oxford University Press; New York: 1997.

Maher L. Drugs, public health and policing in indigenous communities. Drug and Alcohol Review. 2004; 23(3):249–251. [PubMed: 15370003]

Mayock P. Drug pathways, transitions and decisions: The experiences of young people in an inner-city Dublin community. Contemporary Drug Problems. 2002; 29:117–156.

McCoy CB, Comerford M, Metsch LR. Employment among chronic drug users at baseline and 6-month follow-up. Substance Use & Misuse. 2007; 42(7):1055–1067. [PubMed: 17668325]

Measham F. “Doing gender”-“doing drugs”: Conceptualizing the gendering of drugs cultures. Contemporary Drug Problems. 2002; 29:335–373.

Merton RK. Social structure and anomie. American Sociological Review. 1938; 3(5):672–682.

Morris JK, Cook DG, Shaper AG. Loss of employment and mortality. British Medical Journal. 1994; 308(6937):1135–1139. [PubMed: 8173455]

Nutt D, King LA, Saulsbury W, Blakemore C. Development of a rational scale to assess the harm of drugs of potential misuse. The Lancet. 2007; 369(9566):1047–1053.

O'Brien. A caution regarding rules of thumb for variance inflation factors. Quality & Quantity. 2007; 41(5):673–690.

Pager D. The mark of a criminal record. American Journal of Sociology. 2003; 108(5):937–975.

Pearson, G. Deprivation, unemployment and heroin use. In: Dorn, N.; South, N., editors. A Land Fit for Heroin?: Drug policies, prevention and practice. MacMillan Education; London: 1987.

Platt JJ. Vocational rehabilitation of drug abusers. Psychological Bulletin. 1995; 117(3):416–433. [PubMed: 7777647]

Rhodes T. The `risk environment': A framework for understanding and reducing drug-related harm. International Journal of Drug Policy. 2002; 13(2):85–94.

Rhodes T. Risk environments and drug harms: A social science for harm reduction approach. International Journal of Drug Policy. 2009; 20(3):193–201. [PubMed: 19147339]

Rhodes T, Kimber J, Small W, Fitzgerald J, Kerr T, Hickman M, Holloway G. Public injecting and the need for 'safer environment interventions' in the reduction of drug-related harm. Addiction. 2006; 101(10):1384–1393. [PubMed: 16968336]

Rhodes T, Singer M, Bourgois P, Friedman SR, Strathdee SA. The social structural production of HIV risk among injecting drug users. Social Science & Medicine. 2005; 61(5):1026–1044. [PubMed: 15955404]

Richardson L, Sherman SG, Kerr T. Employment amongst people who use drugs: A new arena for research and intervention? International Journal of Drug Policy. 2012; 23(1):3–5. [PubMed: 21996164]

Richardson L, Wood E, Li K, Kerr T. Factors associated with employment among a cohort of injection drug users. Drug and Alcohol Review. 2010; 29(3):293–300. [PubMed: 20565522]

Shannon K, Kerr T, Allinott S, Chettiar J, Shoveller J, Tyndall MW. Social and structural violence and power relations in mitigating HIV risk of drug-using women in survival sex work. Social Science & Medicine. 2008; 66(4):911–921. [PubMed: 18155336]

Shannon K, Strathdee SA, Shoveller J, Rusch M, Kerr T, Tyndall MW. Structural and environmental barriers to condom use negotiation with clients among female sex workers: Implications for HIV-prevention strategies and policy. American Journal of Public Health. 2009; 99(4):659–665. [PubMed: 19197086]

Shaw, VN. Substance Use and Abuse: Sociological Perspectives. Praeger; London: 2002.

Sherman SG, German D, Cheng Y, Marks M, Bailey-Kloche M. The evaluation of the JEWEL project: An innovative economic enhancement and HIV prevention intervention study targeting drug using women involved in prostitution. AIDS Care. 2006; 18(1):1–11. [PubMed: 16282070]

Small W, Kerr T, Charette J, Schechter M, Spittal PM. Impacts of intensified police activity on injection drug users: Evidence from an ethnographic investigation. International Journal of Drug Policy. 2006; 17(2):85–95.

Small W, Rhodes T, Wood E, Kerr T. Public injection settings in Vancouver: Physical environment, social context and risk. International Journal of Drug Policy. 2007; 18(1):27–36. [PubMed: 17689341]

Smith HA. Planning, policy and polarisation in Vancouver's Downtown Eastside. Tijdschrift Voor Economische En Sociale Geografie. 2003; 94(4):496–509.

StataCorp. Statistical Software: Release 11. Stata Corporation; College Station TX: 2011.

Suffet. Some sex-neutral and sex-specific factors related to employment among substance abuse clients. American Journal of Drug and Alcohol Abuse. 1999; 25(3):517–527. [PubMed: 10473012]

Sutherland, EH. Principles of Criminology. JP Lippincott; Philidelphia: 1947.

Weinberg D. Sociological perspectives on addiction. Sociology Compass. 2011; 5(4):298–310.

Williams DR, Mohammed SA, Leavell J, Collins C. Race, socioeconomic status, and health: Complexities, ongoing challenges, and research opportunities. Annals of the New York Academy of Sciences. 2010; 1186:69–101. [PubMed: 20201869]

Williams RL. A note on robust variance estimation for cluster-correlated data. Biometrics. 2000; 56(2):645–646. [PubMed: 10877330]

Wood E, Schachar J, Li K, Stoltz J-A, Shannon K, Miller C, Lloyd-Smith E, Tyndall MW, Kerr T. Sex trade involvement is associated with elevated HIV incidence among injection drug users in Vancouver. Addiction Research & Theory. 2007; 15(3):321–325.

Wood E, Tyndall MW, Spittal PM, Li K, Hogg RS, Montaner JS, O'Shaughnessy MV, Schechter MT. Factors associated with persistent high-risk syringe sharing in the presence of an established needle exchange programme. AIDS. 2002; 16(6):941–943. [PubMed: 11919503]

Wood E, Tyndall MW, Spittal PM, Li K, Kerr T, Hogg RS, Montaner JS, O'Shaughnessy MV, Schechter MT. Unsafe injection practices in a cohort of injection drug users in Vancouver: Could safer injecting rooms help? Canadian Medical Association Journal. 2001; 165(4):405–410. [PubMed: 11531048]

Zarkin GA, Mroz TA, Bray JW, French MT. The relationship between drug use and labour supply for young men. Labour Economics. 1998; 5(4):385–409.

Zimmerman DH, Wieder DL. You can't help but get stoned: Notes on the social organization of marijuana smoking. Social Problems. 1977; 25(2):198–207.

Zinberg, NE. Drug, set, and setting: The basis for controlled intoxicant use. Yale University Press; New Haven: 1984.

Research Highlights

- We assess factors predicting transitions into employment among a cohort of injection drug users in Vancouver, Canada
- Analyses consider different substances and high-intensity patterns of use, as well as features of broader risk environment
- The impact of high-intensity drug use on work uptake is conditioned by exposure to social, physical and structural risk
- Structural vulnerability and risk environments strongly shape labour market outcomes over and above of drug use practices
- Interventions to improve employment should seek to address social, structural and physical aspects of the risk environment

Table 1

Characteristics of study participants at baseline stratified by self-report of a transition into employment over the course of the observation period (n=1579)

Characteristic	Total (*n* = 1579)	Employment over study period		*p* - value
		Yes (29.6%) (*n* = 467)	No (70.4%) (*n* = 1112)	
Socio-demographic characteristics				
Age (med, IQR)[a]	32.6 (25.6–40.1)	32.5 (25.0–39.5)	33.5 (25.9–40.5)	0.059
Female gender	580 (36.7)	117 (25.1)	463 (41.6)	<0.001
Ethnicity				
White	933 (59.1)	291 (62.3)	642 (57.7)	0.091
Aboriginal ancestry	428 (27.1)	108 (23.1)	320 (28.8)	0.021
Asian	73 (4.6)	25 (5.4)	48 (4.3)	0.371
Other	145 (9.2)	43 (9.2)	102 (9.2)	0.982
Marital status[b]	377 (23.9)	110 (23.5)	267 (24.0)	0.846
Educational attainment				
Less than h.s.[c]	308 (19.5)	63 (13.5)	245 (22.0)	<0.001
H.s. or equivalent	1003 (63.5)	308 (66.0)	695 (62.5)	0.193
Trade or college	149 (9.4)	59 (12.6)	90 (8.1)	0.005
University or more	118 (7.5)	37 (7.9)	81 (7.3)	0.660
Drug use				
Daily heroin injection[b]	546 (34.6)	162 (34.7)	384 (34.5)	0.952
Daily cocaine injection[b]	542 (34.3)	151 (32.3)	391 (35.1)	0.280
Daily speedball injection[b]	194 (12.3)	57 (12.2)	137 (12.3)	0.950
Daily crack use[b]	115 (7.3)	24 (5.1)	91 (8.2)	0.034
Health status				
HIV seropositive	322 (20.4)	47 (10.1)	275 (24.7)	<0.001
HCV seropositive	1,195 (75.7)	333 (71.3)	862 (77.5)	0.009
Drug use-related behaviour				
Binge drug use[b]	763 (48.3)	233 (49.9)	234 (21.0)	0.418
Shooting gallery use[b]	465 (29.4)	144 (30.8)	321 (28.9)	0.434

[a] Median, Interquartile range;

[b] Activities or situations in the previous 6 months;

[c] h.s. = High School

Table 2

Event history analysis predicting transitions into employment by demographic, drug use and risk indicators (n=1579)[a]

	Model 1		Model 2		Model 3	
Variable	**Hazard Ratio**	**95% CI**	**Hazard Ratio**	**95% CI**	**Hazard Ratio**	**95% CI**
Individual socio-demographic variables						
Previous job transition	1.85***	(1.66 – 2.06)	1.81***	(1.63 – 2.02)	1.67***	(1.50 – 1.86)
Age	0.96***	(0.95 – 0.97)	0.96***	(0.95 – 0.97)	0.96***	(0.95 – 0.97)
Female gender	0.48***	(0.39 – 0.59)	0.48***	(0.39 – 0.59)	0.47***	(0.38 – 0.58)
Aboriginal ancestry	0.76**	(0.63 – 0.93)	0.76**	(0.62 – 0.93)	0.80*	(0.66 – 0.98)
Marital status[b]	1.44***	(1.19 – 1.73)	1.42***	(1.18 – 1.72)	1.11	(0.92 – 1.34)
Educational attainment[c]	1.48**	(1.17 – 1.87)	1.50**	(1.19 – 1.90)	1.42**	(1.13 – 1.79)
Frequent drug use variables (≥ daily vs. <daily)						
Heroin injection[d]	0.64***	(0.52 – 0.78)	0.65***	(0.54 – 0.80)	0.79*	(0.65 – 0.97)
Cocaine injection[d]	0.60***	(0.48 – 0.74)	0.63***	(0.51 – 0.79)	0.84	(0.66 – 1.06)
Speedball injection[d]	0.55**	(0.37 – 0.84)	0.57**	(0.37 – 0.86)	0.77	(0.50 – 1.17)
Crack use[d]	0.55***	(0.44 – 0.68)	0.54***	(0.43 – 0.68)	0.85	(0.67 – 1.07)
Individual drug-related risk (yes vs. no)						
Binge drug use[d]			0.77*	(0.63 – 0.93)	0.84	(0.69 – 1.03)
Non-fatal overdose[d]			0.90	(0.66 – 1.23)	1.10	(0.80 – 1.51)
Social, structural and physical environment (yes vs. no)						
Public injection[d]					0.65**	(0.48 – 0.87)
Shooting gallery use[d]					0.74*	(0.56 – 0.98)
Unstable housing[d]					0.58***	(0.48 – 0.70)
DTES residency[d,e]					0.46***	(0.38 – 0.56)
Sex trade involvement[d]					0.37***	(0.26 – 0.52)
Recent incarceration[d]					0.71**	(0.58 – 0.87)

*p<0.05,

**p<0.01,

***p<0.001;

[a]Models use clustered standard errors to account for multiple observations per respondent;

[b]Married/common law vs. single;

[c]less than high school vs. high school/equivalent or more;

[d]Activities/events in the six months prior to interview;

[e]DTES=Downtown Eastside