



Published in final edited form as:

*Int J Drug Policy*. 2017 January ; 39: 69–77. doi:10.1016/j.drugpo.2016.08.014.

## Drug use in business bathrooms: An exploratory study of manager encounters in New York City

Brett Wolfson-Stofko<sup>a,c,\*</sup>, Alex S. Bennett<sup>a,c</sup>, Luther Elliott<sup>a,c</sup>, and Ric Curtis<sup>b,c</sup>

<sup>a</sup>National Development & Research Institute, Institute for Special Populations Research, 71 W. 23rd St., 4th Fl., New York, NY 10100, United States of America

<sup>b</sup>John Jay College of Criminal Justice, City University of New York, Department of Law, Police Science and Criminal Justice Administration, and Department of Anthropology, 524 W. 59th St., New York, NY 10019, United States of America

<sup>c</sup>Center for Drug Use and HIV/HCV Research, Rory Meyers College of Nursing, New York University, 433 First Avenue, New York, NY 10100, United States of America

### Abstract

**Background**—Though public bathroom drug injection has been documented from the perspective of people who inject drugs, no research has explored the experiences of the business managers who oversee their business bathrooms and respond to drug use. These managers, by default, are first-responders in the event of a drug overdose and thus of intrinsic interest during the current epidemic of opioid-related overdoses in the United States. This exploratory study assists in elucidating the experiences that New York City business managers have with people who inject drugs, their paraphernalia, and their overdoses.

**Methods**—A survey instrument was designed to collect data on manager encounters with drug use occurring in their business bathrooms. Recruitment was guided by convenience and purposive approaches.

**Results**—More than half of managers interviewed (58%,  $n = 50/86$ ) encountered drug use in their business bathrooms, more than a third (34%) of these managers also found syringes, and the vast majority (90%) of managers had received no overdose recognition or naloxone training. Seven managers encountered unresponsive individuals who required emergency assistance.

**Conclusion**—The results from this study underscore the need for additional research on the experiences that community stakeholders have with public injection as well as educational outreach efforts among business managers. This research also suggests that there is need for a national dialogue about potential interventions, including expanded overdose recognition and

\*Corresponding author at: National Development and Research Institutes, Inc. 71 W. 23rd St., 4th Floor, New York, NY 10100, United States of America. wolfson-stofko@ndri.org, bws6@nyu.edu (B. Wolfson-Stofko).

#### Conflict of interest

The authors of this paper declare no conflict of interest. The opinions of the authors do not necessarily reflect those of National Institutes of Health, National Institute on Drug Abuse, National Development & Research Institutes, Inc., New York University, or City University of New York.

#### Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.drugpo.2016.08.014>

naloxone training and supervised injection facilities (SIF)/drug consumption rooms (DCR), that could reduce public injection and its associated health risks.

### Keywords

Public injection; People who inject drugs; Overdose; Naloxone; Risk environment; Harm reduction

---

### Introduction

Drug overdose death rates per year in the United States (US) more than doubled between 1999 and 2013, from 6.0 to 13.8 per 100,000 (Centers for Disease Control and Prevention, 2015). Though the non-medical use of prescription opioid (NMUPO) use has remained relatively constant from 2007–2012, past year heroin use nearly doubled (373,000–669,000 users) in the US in 2012 (Substance Abuse and Mental Health Services Administration (SAMHSA, 2013). Recent studies have shown that the majority of current heroin injectors in the US were previously NMUPO and then transitioned to heroin and injection (Cicero, Ellis, Surratt, & Kurtz, 2014; Jones, 2013; Mars, Bourgois, Karandinos, Montero, & Ciccarone, 2014; Mateu-Gelabert, Guarino, Jessell, & Teper, 2015; Novak, Bluthenthal, Wenger, Chu, & Kral, 2015).

After a brief decline in the late-2000s, drug overdose deaths increased to 800 in New York City (NYC) in 2014, amounting to a 43% increase between 2010 and 2014 (New York City Department of Health and Mental Hygiene, 2015b). Nearly all (97%) of these overdose deaths in NYC involved more than one substance with 79% involving an opioid with heroin being the most predominant (New York City Department of Health and Mental Hygiene, 2015b). Previous reports suggest that heroin, cocaine, and combinations thereof (known as ‘speedballs’) are overwhelmingly the most commonly injected drugs in NYC (New York City Department of Health and Mental Hygiene, 2010, 2013). Additionally, high rates of hepatitis C have been detected in individuals under 30 years old in NYC with the most common risk factor being heroin injection (Prussing, Bornschlegel, & Balter, 2015).

Public injection has been associated with a variety of health risks and risk behaviours such as syringe sharing, overdose, HIV/HCV/HBV transmission, abscesses, endocarditis, rushed injection and incarceration (Kerr, Fairbairn et al., 2007; Kinner et al., 2012; Koester, Glanz, & Barón, 2005; Leung et al., 2013; Milloy et al., 2008; Otiashvili, Latypov, Kirtadze, Ibragimov, & Zule, 2016; Rhodes et al., 2006; Schoenbaum et al., 1989; Topp et al., 2008; Weeks et al., 2001). And while there are a growing number of syringe exchange programs (SEP) across the US that provide people who inject drugs (PWID) with sterile injecting equipment, they are not authorized to offer a safe and sanitary space for injection. This can be hazardous for PWID who lack a private location where they can inject and for those attempting to conceal their use from others. As a result, these individuals must navigate complex public risk environments riddled with physical, social, economic, and legal harms, when selecting a location to inject (Dovey, Fitzgerald, & Choi, 2001; Parkin, 2013; Rhodes, 2002; Rhodes et al., 2006).

The ‘continuum of descending safety’ was developed to assist in conceptualizing these risks in public injection locations by assessing the degree to which environmental features promote safer injecting techniques and practices (Parkin, 2013, 2014). Public bathrooms<sup>1</sup> have been categorized as ‘controlled’ public injecting locations due to the fact that they are cleaned regularly, provide running water for drug preparation and hand washing, adequate lighting, flat surfaces, have locking doors for privacy, and are frequented regularly by staff and customers who can contact emergency services (and/or law enforcement) in the event of an overdose (Dovey et al., 2001; Parkin, 2013). Alternatively, ‘semi-controlled’ and ‘uncontrolled’ public injection locations such as public parks, alleyways, stairwells, etc. lack many of the ‘controlled’ location’s amenities such as regular cleaning, running water, and privacy and are typically more concealed making it difficult for emergency services to locate an individual in the event of an overdose (Dovey et al., 2001; Parkin, 2013; Small, Rhodes, Wood, & Kerr, 2007).

Reports suggest that public bathrooms are among the most commonly used public injecting locations reported by PWID in NYC (Injection Drug Users Health Alliance, 2015; New York City Department of Health and Mental Hygiene, 2010, 2013). Some of the motivating factors for the use of this location is privacy and immediacy (Crabtree et al., 2013; Parkin, 2013; Parkin & Coomber, 2010). Many of these businesses, particularly fast food, are regularly understaffed making bathroom management difficult (Hart Research Associates, 2015). The privacy afforded by public bathrooms reduces encounters with non-injectors, some of whom may perpetuate stigma or shame PWID, behaviours which have been associated with increased injection-related risk behaviours (Crabtree et al., 2013; Latkin et al., 2010; McKnight et al., 2007; Rhodes et al., 2006; Rhodes et al., 2007; Rivera, DeCuir, Crawford, Amesty, & Lewis, 2014; Strathdee et al., 2012). Additionally, privacy can minimize physical harms by providing PWID with adequate time for drug preparation and injection which can reduce the risk of, for example, abscesses and vein damage associated with rushed or interrupted injections (Bourgois, 1998; Cooper, Moore, Gruskin, & Krieger, 2005; DeBeck et al., 2009; Gibson et al., 2011; Marshall, Kerr, Qi, Montaner, & Wood, 2010; Parkin & Coomber, 2011b; Salmon et al., 2009; Small et al., 2007). Public bathrooms may not be optimal locations for drug preparation and injection, but they are abundant and surpass other public locations (alleyways, parks, etc.), especially in large urban centres such as NYC, in terms of privacy, cleanliness, and accessibility, making them far better options for PWID when they are experiencing withdrawal (‘dope sickness’) and lack access to a suitable private location (Crabtree et al., 2013; Injection Drug Users Health Alliance, 2015; Parkin, 2013).

The Injection Drug Users Health Alliance (IDUHA) recruited and surveyed 440 active injectors from SEPs in NYC and assessed the frequency of and risks associated with public injection (Injection Drug Users Health Alliance, 2015). Of the participants, 60% reported injecting in locations such as public bathrooms, abandoned buildings, shooting galleries and vehicles within the past three months (Injection Drug Users Health Alliance, 2015).

---

<sup>1</sup>The term ‘public bathroom’ is used to define a room that contains a toilet, access to a sink, is available for public use, and managed by either a local government or by the business in which it is located. The term is synonymous with ‘public toilet’, ‘public restroom’, ‘public washroom’, and ‘public water closet’.

Individuals injecting in these locations were twice as likely to report overdosing in the past year and those experiencing street-homelessness were 9.2 times more likely to inject in public locations and 8.2 times more likely to inject in a public bathroom (Injection Drug Users Health Alliance, 2015). The findings about risks to PWID from this report are supported by studies that have explored public injection in other localities (DeBeck et al., 2009; Hunt, Lloyd, Kimber, & Tompkins, 2007; Linton, Celentano, Kirk, & Mehta, 2013).

New York City has a wide variety of public bathrooms that all contain at least one toilet and access to a sink. These bathrooms are managed either by local government or private businesses and are available for public use, though access to public bathrooms located in private businesses (referred to as ‘business bathrooms’) may be restricted to paying customers. Whether or not a business must provide bathrooms for customers varies according to the nature of the business. The New York Department of Health and Mental Hygiene requires that food service establishments with a seating capacity of 20 or more customers must provide access to a bathroom, though some smaller businesses do as well (New York City Department of Health and Mental Hygiene, 2015a).

This study focused exclusively on business bathrooms and the experiences of the managers overseeing them. This analysis does not include park, library, or transit hub bathrooms managed by the local government in order not to conflate or overgeneralise practices that might vary between publicly and privately operated bathrooms, although these venues remain important topics for future research. To our knowledge, this is the first study that has attempted to quantify business manager encounters with drug use, paraphernalia, and overdose occurring within business bathrooms.

## Methods

### Survey design, pilot sampling, and refinement

The survey instrument was drafted by the first author and revised according to feedback received from co-authors, SEP staff, PWID, and business managers. Study protocols and the complete survey instrument were submitted to the National Development and Research Institutes, Inc. Institutional Review Board and granted exempt status on the grounds that personally identifying information was not being collected.

The survey was piloted with 3 managers in order to refine questions, address new questions, and then piloted with 3 more managers to ensure clarity. Through this iterative process, it became clear that there was a key misconception among managers about the definition of ‘overdose’. Some managers elaborated on their definition and many classified someone who was visibly intoxicated but still responsive as having overdosed. The survey was then revised and the authors decided to replace the term ‘overdose’ with, ‘unresponsive,’ because it both accurately defines an overdose and is the term used for training non-medical personnel in opioid overdose reversal techniques (Harm Reduction Coalition, 2012). This term was then incorporated in the following question, “Have you ever called 911 because someone was unresponsive in the bathroom?”<sup>2</sup> That question was followed by, “Do you believe it was

---

<sup>2</sup>911 is the number used to contact emergency medical services and law enforcement in the United States.

drug related?” in order to ensure that the person was not experiencing another complication (i.e. diabetic coma).

## Sampling

The New York City Department of Health and Mental Hygiene reports overdose deaths according to United Hospital Fund (UHF) defined neighbourhoods (New York City Department of Health and Mental Hygiene, 2006). Survey data were collected in all five-boroughs of NYC ( $N = 86$ ) from 30 unique UHF-defined neighbourhoods (New York City Department of Health and Mental Hygiene, 2006). Overdose death rates range from 4.2 to 28.3 per 100,000 and were categorized from highest to lowest (Table 2) (New York City Department of Health and Mental Hygiene, 2015b). For this study, Tier I includes neighbourhoods experiencing the highest rates of overdose mortality (18.5–28.3 per 100,000), Tier II includes neighbourhoods experiencing overdose mortality rates of 12.5–18.4 per 100,000, Tier III experience 8.2–12.4 per 100,000, Tier IV experience 5.1–8.1 per 100,000 and Tier V experience 4.2–5.0 per 100,000. A combination of convenience and purposive sampling (Suen, Huang, & Lee, 2014) were used to ensure that data were obtained from all five boroughs and from a variety of neighbourhoods. Analysis of the socioeconomic characteristics of the Tiers was conducted after data collection was completed. The percentage of residents living in poverty, as identified by zip code, was averaged to calculate the level of poverty in each Tier. Thirty-nine percent of residents in Tier I neighbourhoods were living in poverty, which consisted of neighbourhoods with some of the highest levels in NYC (United States Census Bureau, 2016). Twenty-four percent of Tier II residents lived in poverty, 23% of Tier III residents, 13% of Tier IV, and 17% of Tier V (United States Census Bureau, 2016).

Data were collected by social science undergraduates from John Jay College of Criminal Justice who were recruited and trained as student research assistants. All student research assistants completed the Responsible Conduct of Research and Protections of Human Subjects CITI Trainings and received 4 h of further training that focused on the specific requirements and procedures of the study prior to data collection. Students were then instructed to conduct convenience sampling within the five boroughs of NYC in neighbourhoods that they frequented in order to obtain a semi-randomized sample. Data were collected only from fast-food restaurants, coffee shops, laundromats, sit-down restaurants (without a bar), *bodegas*, food markets, clothing stores and shopping malls that provided a bathroom for customers. After reviewing survey locations one month into the study, authors identified geographic areas that lacked representation (i.e. Lower Manhattan, East Bronx) and asked students to explore these areas and conduct further data collection.

A total of eighty-six business managers<sup>3</sup> participated in this study. Thirty-four of these businesses were located in Manhattan, 20 in Queens, 16 in The Bronx, 14 in Brooklyn, and 3 in Staten Island. All data reported in the findings below ( $n = 50$ ) were collected from managers that had encountered drug use in their business bathroom within the previous 6 months. Surveys were not conducted if the business did not have a bathroom. If the manager

---

<sup>3</sup>The study included managers and assisted managers, but all will be referred to as ‘managers’.

had not encountered drug use in their business bathroom within the past six months ( $n = 36$ ), the survey was immediately ended after collecting only locator and business specific data (zip code, cross streets, the shift worked by the manager, the nature of the bathroom (i.e. single- or multi-stalled)).

## Data analysis

Descriptive statistics, one-way ANOVA, and Tukey post-hoc tests (Lowry, 2015; Tukey, 1949) were computed using IBM SPSS Statistics 23. One-way ANOVA and Tukey post-hoc tests were used to assess statistically significant differences in manager responses between Tiers.

## Measurement

After collecting information about each business and its bathroom, project staff asked managers questions about their encounters, and those reported to them by their staff, with people using drugs in the bathroom, paraphernalia, and overdoses over the past six months only. A drug use 'encounter' for this study was broadly defined as an interaction with someone while in the bathroom or either seeing, smelling, or hearing the consumption of drugs occurring within the bathroom. The term also encompassed managers who had opened bathroom doors due to an individual being unresponsive or had confronted individuals exiting the bathroom whom they felt to be noticeably intoxicated.

Managers were also asked how many times they called 911 when they encountered drug use and whether they requested law enforcement, emergency medical services (EMS), or both. They were also asked how many times they called 911 due to an encounter with an unresponsive person. If they had an encounter with an unresponsive person, they were asked whether they alerted their superior/corporate office about the event and the response they received.

Additionally, project staff collected data on the type of paraphernalia managers found in the business bathrooms and whether it contained blood. Managers were also asked whether they received any customer complaints about drug use occurring in their business bathroom. Finally, managers were asked if they and their staff were trained in how to recognize a drug overdose and how to reverse an opioid overdose with naloxone. They were then asked whether they thought overdose recognition and naloxone training would be useful for them and their staff (see: Appendix A in Supplementary material for the complete survey instrument).

## Results

### Business characteristics

A total of 86 managers participated in the study. Of these managers, 58% ( $n = 50$ ) reported that they had encountered people using drugs in their business bathroom in the past six months (Table 1). Encounters were reported in 25 of the 30 UHF neighbourhoods (83%) surveyed. The average number of monthly encounters experienced by managers ranged from 1 to 300 ( $\sigma = 119$ ) with a median of 3 encounters per month.

Drug use encounters were reported by 66% of fast-food managers ( $n = 25/38$ ), 33% of coffee shops ( $n = 2/6$ ), 43% of food markets ( $n = 3/7$ ), 60% of clothing stores ( $n = 3/5$ ), 67% of restaurants ( $n = 12/18$ ), 50% of bodegas ( $n = 2/4$ ), 43% of laundromats ( $n = 3/7$ ), and no encounters were reported at the shopping mall ( $n = 0/1$ ). Tier I encounters occurred primarily at fast-food (73%) as well as at food markets (18%) and a laundromat (9%) (Table 2). Tier II managers had a total of three encounters, one at a fast-food, one at a clothing store, and one at a restaurant (Table 2). Most of Tier III encounters occurred at fast-food (39%) and restaurants (30%) followed by coffee shops (9%), clothing stores (9%), laundromats (9%), and a *bodega* (4%) (Table 2). Tier IV encounters occurred primarily at fast-food (60%) as well as at restaurants (20%), a *bodega* (10%), and a food market (10%) (Table 2). Tier V encounters occurred at two restaurants (67%) and one fast-food (33%) (Table 2).

### Bathroom characteristics

The vast majority (81%) of businesses that encountered drug use had single-stall bathrooms. A total of nine businesses had multi-stall bathrooms; one fast-food and one laundromat in Tier I, a clothing store in Tier II, one fast-food and one restaurant in Tier III, one fast-food and one restaurant in Tier IV, and one restaurant in Tier V. Managers with single-stall bathrooms reported a median of 3 encounters ( $x = 22$ ) compared to a median of 1 encounter ( $x = 2$ ) for multi-stall bathrooms.

### Encounters and paraphernalia

Seventy-three percent of managers interviewed in Tier I neighbourhoods encountered drug use in their bathrooms as did 75% of Tier II, 61% of Tier III, 43% of Tier IV, and 50% of Tier V (Table 2).

Nearly all managers (94%) who encountered drug use found drug paraphernalia in their business bathroom and over one-third (34%) of them found syringes (Table 1). All Tier I managers found paraphernalia and 82% found syringes (Table 3). Two out of three Tier II managers found paraphernalia but only one found syringes. However, 91% of Tier III managers found paraphernalia and 30% found syringes. Tier IV and V managers did not find any syringes but 90% and 100% found drug paraphernalia, respectively (Table 3). There was a statistically significant difference between Tiers as determined by one-way ANOVA ( $p < 0.05$ ). A Tukey post-hoc test revealed that Tier III ( $p = 0.021$ ), IV ( $p = 0.001$ ), and V ( $p = 0.028$ ) businesses had significantly fewer syringe encounters compared to Tier I businesses. There was no statistically significant difference between Tier I and II.

Crack pipes were found by 22% of managers who encountered drug use in their business bathroom (Table 1). Over a quarter (26%) of Tier III managers found crack pipes as did 18% of Tier I, 10% of Tier IV and one manager of Tier II and one manager of Tier V as well (Table 3).

### Requests for emergency services

Nearly a quarter of managers (24%) called 911 when they encountered people using drugs in their business bathroom (Table 1). Forty-five percent of Tier I managers called 911 with each

manager making an average of 20 calls in the past six months. One Tier II manager, two Tier III, two Tier IV and one Tier V manager placed 911 calls, with a median of 3, in the past six months. Over half of these managers (55%) making 911 calls requested law enforcement while 45% requested both law enforcement and EMS. All of the requests for both law enforcement and EMS came from Tier I and II managers (Table 3).

Seven managers called 911 because they found someone unresponsive in their business bathroom and believed it was a result of drug use: five of these encounters occurred in Tier I, one in Tier II, and one in Tier III (Tables 1 and 3). No deaths were reported within the past six months.

### **Customer complaints**

Forty-four percent of managers received customer complaints regarding drug use occurring in their business bathroom (Table 1). Eighty-two percent of Tier I managers received customer complaints as did one out of three Tier II managers, 43% of Tier III managers, 20% of Tier IV managers, and Tier V managers received no complaints (Table 3).

### **Overdose recognition and naloxone training**

Overall, only 10% of managers' reported some type of overdose recognition and overdose reversal training with naloxone: three from Tier I, one from Tier II, and one from Tier III (Tables 1 and 3). Despite their lack of exposure to overdose prevention education, 64% believed that this training would be useful, including 70% of Tier I, 67% of Tier II and Tier III, 40% of Tier IV, and all of Tier V (Tables 1 and 3).

## **Discussion**

Results from this study show that drug use is occurring in business bathrooms throughout NYC. The frequent encounters with syringes reported by managers further supports the assertion that business bathrooms are being used for drug injection. Managers working in Tier I neighbourhoods reported the most encounters occurring in the past 6 months, the greatest number of monthly encounters, the most encounters with syringes and the most encounters with unresponsive individuals suggesting that there is an unequal distribution of risk between Tiers. It is worth noting that two managers (one fast food and one food market) reported an average of 300 encounters per month, encountering approximately 10 people per day using drugs in their business bathroom. These businesses were located in different boroughs but both were located in high poverty neighbourhoods. What made these businesses more amenable for drug use warrants further investigation but both of these business bathrooms were single-stalled, which may provide more privacy and noise suppression compared to multi-stalled bathrooms, and both businesses required staff to unlock bathrooms for customers indicating that managers may be aware of the activities occurring in their bathroom and have been taking measures to reduce the frequency of drug use.

Despite the exploratory nature of the study and the use of convenience sampling, findings generally match up with Tiers defined by overdose mortality rates. These data suggest that the use of these Tiers may be useful in identify/predicting business bathroom drug use.



The socioeconomic status of the neighbourhoods that comprise each Tier may also represent an important variable in understanding why encounters are more frequent in certain areas than others. Residents of neighbourhoods experiencing high rates of poverty generally suffer from higher rates of overdose mortality, owing in part, at least, to lack of social capital, inadequate social and economic resources and the shortage of well-paying legal jobs that has led some residents of these neighbourhoods to involvement with illegal drug markets (Bourgois, 1995; Cerdá et al., 2013; Dunlap, Johnson, Kotarba, & Fackler, 2010; Galea et al., 2003; Gotsens et al., 2011; Hannon & Cuddy, 2006; Marzuk et al., 1997; Ross et al., 2000; Sullivan, 1989). People who inject drugs experience a need for privacy and immediacy, as previously discussed, after procuring drugs in order to quickly alleviate withdrawal symptoms or suppress cravings and business bathrooms in close proximity to drug markets may fulfil this need.

Over a third of managers found improperly disposed syringes in their business bathrooms, a hazard for transmitting HIV, HCV and HBV to other PWID, community members and staff (Blenkharn, 2008; Lawitts, 2002; Lorentz, Hill, & Samimi, 2000; World Health Organization, 2015) though the transmission of these viruses via accidental needle sticks is uncommon (Papenburg et al., 2008; Russell & Nash, 2002). Regardless, post-exposure medical care, blood testing, and post-exposure prophylaxis (PEP) can produce considerable amounts of anxiety and stress on individuals who are injured in this manner (Parkin & Coomber, 2009; Sohn, Kim, Kim, & Han, 2006). Food service managers are not currently trained in sharps disposal and needle stick injury reporting which may delay both customers and staff from obtaining appropriate medical care and PEP within the timeframe for it to be effective (New York State Restaurant Association, 2015). Therefore, the installation of sharps containers in business bathrooms and subsequent training may reduce the amount of improperly disposed sharps and further reduce the possibility of staff and community member needle sticks.

In Cambridge (UK), for example, stand-alone public toilets were equipped with sharps containers and nearly 6000 syringes were collected from 20 of these toilets in a single year, resulting in a noticeable reduction of improperly disposed syringes in the area (Parkin, 2016). This suggests that sharps containers in public bathrooms can be an effective tool for encouraging proper syringe disposal. However, these toilets were shut down when they became improperly framed by the media as “health hazards” and became targets for law enforcement (Parkin, 2016). There is also the potential that the presence of sharps containers may inadvertently alert customers to injection drug use occurring within the business’s bathroom and further stigmatize PWID (Parkin & Coomber, 2011a). There is also a chance that a ‘honeypot’ effect may occur at businesses that provide sharps containers (as well as those that possess naloxone), meaning that some PWID may preferentially inject in businesses that provide this service. On the other hand, a lack of sharps containers results in syringes being flushed down toilets, leading to clogs and the need for repairs. Further research is needed in order to determine the acceptability and feasibility of installing sharps containers in business bathrooms.

Business managers, particularly those in Tier I neighbourhoods, report receiving customer complaints about drug use occurring in the bathroom. This suggests that drug use in these bathrooms may have the potential to deter customers and financially harm these businesses.

It is also important to note that nearly half of managers requested both law enforcement and EMS, particularly Tier I managers who encountered drug use more frequently. Requests for EMS suggest that many of the 911 calls were not solely made because of disruptive behaviour but potentially out of concern for an individual's health.

Although no deaths were reported by managers in this study, drug overdose deaths have occurred in public bathrooms throughout the US (Seelye, 2016). In particular, less-frequented bathrooms without queues and those infrequently utilized or cleaned by staff may lead to a delayed encounter and response that could result in death.

A growing number of laypersons are being trained on how to recognize an opioid overdose and administer naloxone throughout the US (Wheeler, Jones, Gilbert, & Davidson, 2015). A previous study of laypersons trained in opioid overdose and naloxone administration demonstrated that such persons, when properly trained, were able to correctly recognize an overdose situation in which naloxone should be administered comparable to that of medical experts and suggests that it would be feasible to train business managers on these techniques (Green, Heimer, & Grau, 2008). This data supports the notion that managers should be capable of intervening in a medical crisis within their community provided they receive proper training. Unexpectedly, a majority of managers from nearly all Tiers believed that this training would be useful, contrary to the reluctance of public and private front-line staff in the UK who favoured more punitive approaches (Parkin, 2013; Parkin & Coomber, 2009). The data suggest that an overdose recognition and naloxone training intervention may be most beneficial to business managers working in Tier I neighbourhoods who are experiencing high rates of encounters and unresponsive individuals though managers from other Tiers would likely benefit as well. Future research is needed in order to determine whether managers will participate in overdose recognition and naloxone training when it is offered as well as whether managers are willing to physically tend to PWID in the event of an overdose.

While training managers in overdose reversal and installing sharps containers in bathrooms may reduce some key risks (improper sharps disposal), these interventions will not reduce the use of business bathrooms for injection. The results of this study, though exploratory, support the need for supervised injection facilities (SIF), if not drug consumption rooms (DCR), which would provide a hygienic and supervised environment for all types of problematic drug use instead of having it occur in public places. Current harm reduction services in the US provide sterile injection equipment and safe crack smoking kits but are restricted by the federal 'Crack House' statutes from legally providing a safe space for injections or drug consumption (Beletsky, Davis, Anderson, & Burris, 2008). These restrictions, in part, divert PWID to unsafe and unhygienic injecting locations within their community such as business bathrooms. Research also suggests that SIF/DCR are capable of successfully managing overdoses, reducing overdose deaths, reducing HIV/HCV risk behaviour, increase uptake of addiction treatment, reduce public injection and public

disorder while not increasing drug injection initiation, community drug use, or drug related crime and being cost-effective (Andresen & Boyd, 2010; DeBeck et al., 2011; Freeman et al., 2005; Kerr, Kimber, DeBeck, & Wood, 2007; Kerr et al., 2006; Kerr, Tyndall, Li, Montaner, & Wood, 2005; Kerr, Tyndall et al., 2007; Marshall, Milloy, Wood, Montaner, & Kerr, 2011; Petrar et al., 2007; Salmon, Thein, Kimber, Kaldor, & Maher, 2007; Small, Van Borek, Fairbairn, Wood, & Kerr, 2009; Stoltz et al., 2007; Wood et al., 2004; Wood, Tyndall, Lai, Montaner, & Kerr, 2006; Wood, Tyndall, Zhang, Montaner, & Kerr, 2007; Wood, Tyndall, Zhang et al., 2006). Supervised injection facilities and drug consumption rooms also have the ability to reduce both public injection and improperly disposed syringe sightings as reported by researchers, local residents, and business managers in Vancouver, BC, Canada and Sydney, NSW, Australia making this intervention worthy of further investigation in addition to the education and training of managers in overdose recognition and naloxone use (Petrar et al., 2007; Salmon et al., 2007; Stoltz et al., 2007; Wood et al., 2004).

It is important to note that SIF/DCR would not replace any of the current PWID services (i.e. SEP, medication-assisted therapy, addiction treatment, business manager overdose recognition and naloxone training, etc.), but would offer additional services that compliment current harm reduction and treatment programs by preventing harm to PWID and the community until the individual is ready for treatment.

The results from this study underscore the need for further research on this topic. Future research could explore the experience of local government workers who tend to public bathrooms (park bathrooms, library bathrooms, bus station bathrooms, subway bathrooms, etc.) in addition to the expansion of this study outside of urban centres to suburban and rural communities. Interventions could also be designed to explore the feasibility and efficacy of providing managers with overdose, naloxone, and safe sharps disposal training as well as the installation of sharps containers in business bathrooms.

## Limitations

The results from this exploratory study cannot be generalized for all of NYC being that this study used a combination of purposive and convenience sampling and consisted of a small sample size. However, the goal of this study was to generate preliminary indications of whether managers were aware of drug use occurring in their business bathrooms. Survey results appear to demonstrate the memorable nature of overdose and drug use encounters and managers' willingness to discuss these timely topics. That said, recall may vary considerably between managers with different experiences and perceptions of substance use. Additionally, some managers working in businesses with bathrooms refused to participate in the study and the number of refusals and reasons were not recorded. This study also did not thoroughly interview managers who did not encounter drug use even though these managers may find paraphernalia in their business bathroom. And although we are unable to determine exactly which drugs are consumed, paraphernalia is capable of providing hints about administration routes which are unique to particular drugs. Due to the exploratory nature of this study, managers were not provided an opportunity to suggest or support alternative harm reduction or punitive interventions they believe might be more effective at reducing drug use

in business bathrooms, leaving questions about managers' perceptions about their role in managing this risk environment. There is also the possibility that managers provided socially desirable answers in regards to encounters and overdose as well as overdose recognition and naloxone training.

## Conclusion

Business bathrooms appeared to be used by some PWID for injection purposes with some managers reporting regular encounters as identified by this exploratory survey of business managers. These bathrooms are being utilized as unregulated injection facilities that lack adequate sharps disposal, sterile water, sanitary surfaces, and may lead to rushed or interrupted injecting as well as a delayed response to drug overdoses. Drug use in business bathrooms may deter customers, damage a business's reputation and profitability, and create an unsafe environment for customers and staff. Managers are also not equipped with the knowledge and resources needed to properly respond to drug overdoses. The study also preliminarily demonstrates the use of overdose death rate Tiers as a technique for identifying businesses at risk for bathroom drug use which can be used to tailor strategic interventions. Future research should explore the feasibility and efficacy of providing managers with overdose recognition, naloxone, and safe sharps disposal training as well as the installation of sharps containers in business bathrooms. Additionally, the operation of SIF/DCR should be considered as a means to reduce both public injection and improperly disposed paraphernalia.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgments

The authors wish to thank the staff and participants at BOOM! Health, Washington Heights CORNER Project, New York Harm Reduction Educators and SIF NYC for their feedback and support. In particular, Maria Caban, Ed Manchess, Adrian Feliciano, Adriana Pericchi Dominguez, Evelyn Silva, Tara Larsen, Terrell Jones, Taeko Frost and Sarah Deutsch. We would also like to thank all the student research assistants from John Jay College of Criminal Justice that assisted in data collection, Jonathan Broker for data management, NDRI BST fellows for our discussions, and M. Dot Fullwood for his assistance with SPSS. This research was supported by the Ruth L. Kirschstein National Service Award (5T32DA007233) and by R01DA03675402 awarded to Alex S. Bennett.

## References

- Andresen MA, Boyd N. A cost-benefit and cost-effectiveness analysis of Vancouver's supervised injection facility. *International Journal of Drug Policy*. 2010; 21(1):70–76. <http://dx.doi.org/10.1016/j.drugpo.2009.03.004>. [PubMed: 19423324]
- Beletsky L, Davis CS, Anderson E, Burris S. The law (and politics) of safe injection facilities in the United States. *American Journal of Public Health*. 2008; 98(2):231–237. <http://dx.doi.org/10.2105/AJPH.2006.103747>. [PubMed: 18172151]
- Blenkharn JI. Clinical wastes in the community: Local authority management of discarded drug litter. *Public Health*. 2008; 122(7):725–728. <http://dx.doi.org/10.1016/j.puhe.2007.09.013>. [PubMed: 18206193]
- Bourgois, P. *In search of respect: Selling crack in El Barrio*. Cambridge University Press; 1995.

- 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. <http://dx.doi.org/10.3109/10826089809056260>. [PubMed: 9758016]
- Centers for Disease Control and Prevention. CDC WONDER. 2015. Retrieved from <http://wonder.cdc.gov>
- Cerdá M, Ransome Y, Keyes KM, Koenen KC, Tardiff K, Vlahov D, Galea S, et al. Revisiting the role of the urban environment in substance use: The case of analgesic overdose fatalities. *American Journal of Public Health*. 2013; 103(12):2252–2260. <http://dx.doi.org/10.2105/AJPH.2013.301347>. [PubMed: 24134362]
- Cicero TJ, Ellis MS, Surratt HL, Kurtz SP. The changing face of heroin use in the united states: A retrospective analysis of the past 50 years. *JAMA Psychiatry*. 2014; 71(7):821–826. <http://dx.doi.org/10.1001/jamapsychiatry.2014.366>. [PubMed: 24871348]
- Cooper H, Moore L, Gruskin S, Krieger N. The impact of a police drug crackdown on drug injectors' ability to practice harm reduction: A qualitative study. *Social Science & Medicine*. 2005; 61(3): 673–684. [PubMed: 15899325]
- Crabtree A, Mercer G, Horan R, Grant S, Tan T, Buxton JA. A qualitative study of the perceived effects of blue lights in washrooms on people who use injection drugs. *Harm Reduction Journal*. 2013; 10:22–22. <http://dx.doi.org/10.1186/1477-7517-10-22>. [PubMed: 24099145]
- 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. <http://dx.doi.org/10.1136/jech.2007.069013>. [PubMed: 18628270]
- DeBeck K, Kerr T, Bird L, Zhang R, Marsh D, Tyndall M, Wood E. Injection drug use cessation and use of North America's first medically supervised safer injecting facility. *Drug and Alcohol Dependence*. 2011; 113(2–3):172–176. <http://dx.doi.org/10.1016/j.drugalcdep.2010.07.023>. [PubMed: 20800976]
- Dovey K, Fitzgerald J, Choi Y. Safety becomes danger: Dilemmas of drug-use in public space. *Health & Place*. 2001; 7(4):319–331. [http://dx.doi.org/10.1016/S1353-8292\(01\)00024-7](http://dx.doi.org/10.1016/S1353-8292(01)00024-7). [PubMed: 11682331]
- Dunlap E, Johnson BD, Kotarba JA, Fackler JL. Macro-level social forces and micro-level consequences: Poverty, alternate occupations, and drug dealing. *Journal of Ethnicity in Substance Abuse*. 2010; 9(2):115–127. <http://dx.doi.org/10.1080/15332641003772611>. [PubMed: 20509085]
- Freeman K, Jones CGA, Weatherburn DJ, Rutter S, Spooner CJ, Donnelly N. The impact of the Sydney Medically Supervised Injecting Centre (MSIC) on crime. *Drug and Alcohol Review*. 2005; 24(2):173–184. <http://dx.doi.org/10.1080/09595230500167460>. [PubMed: 16076587]
- Galea S, Ahern J, Vlahov D, Coffin PO, Fuller C, Leon AC, Tardiff K. Income distribution and risk of fatal drug overdose in New York City neighborhoods. *Drug and Alcohol Dependence*. 2003; 70(2): 139–148. [http://dx.doi.org/10.1016/S0376-8716\(02\)00342-3](http://dx.doi.org/10.1016/S0376-8716(02)00342-3). [PubMed: 12732407]
- Gibson EK, Exner H, Stone R, Lindquist J, Cowen L, Roth EA. A mixed methods approach to delineating and understanding injection practices among clientele of a Victoria, British Columbia needle exchange program. *Drug and Alcohol Review*. 2011; 30(4):360–365. <http://dx.doi.org/10.1111/j.1465-3362.2010.00219.x>. [PubMed: 21355916]
- Gotsens M, Marí-Dell'Olmo M, Martínez-Beneito MÁ, Pérez K, Pasarín MI, Daponte A, Borrell C. Socio-economic inequalities in mortality due to injuries in small areas of ten cities in Spain (MEDEA Project). *Accident Analysis & Prevention*. 2011; 43(5):1802–1810. <http://dx.doi.org/10.1016/j.aap.2011.04.013>. [PubMed: 21658508]
- Green TC, Heimer R, Grau LE. Distinguishing signs of opioid overdose and indication for naloxone: An evaluation of six overdose training and naloxone distribution programs in the United States. *Addiction (Abingdon, England)*. 2008; 103(6):979–989. <http://dx.doi.org/10.1111/j.1360-0443.2008.02182.x>.
- Hannon L, Cuddy MM. Neighborhood ecology and drug dependence mortality: An analysis of New York City census tracts. *The American Journal of Drug and Alcohol Abuse*. 2006; 32(3):453–463. <http://dx.doi.org/10.1080/00952990600753966>. [PubMed: 16864473]
- Harm Reduction Coalition. Guide to developing and managing overdose prevention and take-home naloxone projects. 2012 Retrieved from.

- Hart Research Associates. Key findings from a survey on fast food worker safety Retrieved from National Council for Occupational Safety and Health. 2015. <http://www.coshnetwork.org/national-cosh-reports>
- Hunt N, Lloyd C, Kimber J, Tompkins C. Public injecting and willingness to use a drug consumption room among needle exchange programme attendees in the UK. *International Journal of Drug Policy*. 2007; 18(1):62–65. <http://dx.doi.org/10.1016/j.drugpo.2006.11.018>. [PubMed: 17689345]
- Injection Drug Users Health Alliance. Injection drug users health alliance (IDUHA): Citywide evaluation study. 2015 Retrieved from.
- Jones CM. Heroin use and heroin use risk behaviors among nonmedical users of prescription opioid pain relievers—United States, 2002–2004 and 2008–2010. *Drug and Alcohol Dependence*. 2013; 132(1–2):95–100. <http://dx.doi.org/10.1016/j.drugalcdep.2013.01.007>. [PubMed: 23410617]
- Kerr T, Fairbairn N, Tyndall M, Marsh D, Li K, Montaner J, Wood E. Predictors of non-fatal overdose among a cohort of polysubstance-using injection drug users. *Drug and Alcohol Dependence*. 2007; 87(1):39–45. <http://dx.doi.org/10.1016/j.drugalcdep.2006.07.009>. [PubMed: 16959438]
- Kerr T, Kimber J, DeBeck K, Wood E. The role of safer injection facilities in the response to HIV/AIDS among injection drug users. *Current HIV/AIDS Reports*. 2007; 4(4):158–164. <http://dx.doi.org/10.1007/s11904-007-0023-8>. [PubMed: 18366946]
- Kerr T, Stoltz J-A, Tyndall M, Li K, Zhang R, Montaner J, Wood E. Impact of a medically supervised safer injection facility on community drug use patterns: A before and after study. *BMJ: British Medical Journal*. 2006; 332(7535):220–222. [PubMed: 16439401]
- Kerr T, Tyndall M, Li K, Montaner J, Wood E. Safer injection facility use and syringe sharing in injection drug users. *The Lancet*. 2005; 366(9482):316–318. [http://dx.doi.org/10.1016/S0140-6736\(05\)66475-6](http://dx.doi.org/10.1016/S0140-6736(05)66475-6).
- Kerr T, Tyndall MW, Zhang R, Lai C, Montaner JSG, Wood E. Circumstances of first injection among illicit drug users accessing a medically supervised safer injection facility. *American Journal of Public Health*. 2007; 97(7):1228–1230. <http://dx.doi.org/10.2105/AJPH.2006.086256>. [PubMed: 17538061]
- Kinner SA, Milloy MJ, Wood E, Qi J, Zhang R, Kerr T. Incidence and risk factors for non-fatal overdose among a cohort of recently incarcerated illicit drug users. *Addictive Behaviors*. 2012; 37(6):691–696. <http://dx.doi.org/10.1016/j.addbeh.2012.01.019>. [PubMed: 22385733]
- Koester S, Glanz J, Barón A. Drug sharing among heroin networks: Implications for HIV and hepatitis B and C prevention. *AIDS and Behavior*. 2005; 9(1):27–39. <http://dx.doi.org/10.1007/s10461-005-1679-y>. [PubMed: 15812611]
- Latkin C, Srikrishnan AK, Yang C, Johnson S, Solomon SS, Kumar S, Solomon S. The relationship between drug use stigma and HIV injection risk behaviors among injection drug users in Chennai, India. *Drug and Alcohol Dependence*. 2010; 110(3):221–227. <http://dx.doi.org/10.1016/j.drugalcdep.2010.03.004>. [PubMed: 20462707]
- Lawitts S. Needle sightings and on-the-job needle-stick injuries among New York City Department of Sanitation Workers. *Journal of the American Pharmacists Association*. 2002; 42(6S):S92–S93.
- Leung LTF, Ti L, Hayashi K, Suwannawong P, Kaplan K, Wood E, Kerr T. Health and safety risks associated with public injecting among people who inject drugs in Bangkok, Thailand. *Drug and Alcohol Review*. 2013; 32(6):582–587. <http://dx.doi.org/10.1111/dar.12060>. [PubMed: 24033410]
- Linton SL, Celentano DD, Kirk GD, Mehta SH. The longitudinal association between homelessness, injection drug use, and injection-related risk behavior among persons with a history of injection drug use in Baltimore, MD. *Drug and Alcohol Dependence*. 2013; 132(3):457–465. <http://dx.doi.org/10.1016/j.drugalcdep.2013.03.009>. [PubMed: 23578590]
- Lorentz J, Hill L, Samimi B. Occupational needlestick injuries in a metropolitan police force. *American Journal of Preventive Medicine*. 2000; 18(2):146–150. [http://dx.doi.org/10.1016/S0749-3797\(99\)00137-3](http://dx.doi.org/10.1016/S0749-3797(99)00137-3). [PubMed: 10698245]
- Lowry, R. Concepts & applications of inferential statistics. 2015. Retrieved from <http://vassarstats.net/textbook/index.html>
- Mars SG, Bourgois P, Karandinos G, Montero F, Ciccarone D. Every ‘Never’ I ever said came true: Transitions from opioid pills to heroin injecting. *International Journal of Drug Policy*. 2014; 25(2):257–266. <http://dx.doi.org/10.1016/j.drugpo.2013.10.004>. [PubMed: 24238956]

- Marshall BDL, Kerr T, Qi J, Montaner JSG, Wood E. Public injecting and HIV risk behaviour among street-involved youth. *Drug and Alcohol Dependence*. 2010; 110(3):254–258. <http://dx.doi.org/10.1016/j.drugalc-dep.2010.01.022>. [PubMed: 20456875]
- Marshall BDL, Milloy MJ, Wood E, Montaner JSG, Kerr T. Reduction in overdose mortality after the opening of North America's first medically supervised safer injecting facility: A retrospective population-based study. *The Lancet*. 2011; 377(9775):1429–1437. [http://dx.doi.org/10.1016/S0140-6736\(10\)62353-7](http://dx.doi.org/10.1016/S0140-6736(10)62353-7).
- Marzuk PM, Tardiff K, Leon AC, Hirsch CS, Stajic M, Portera L, Hartwell N. Poverty and fatal accidental drug overdoses of cocaine and opiates in New York City: An ecological study. *The American Journal of Drug and Alcohol Abuse*. 1997; 23(2):221–228. <http://dx.doi.org/10.3109/00952999709040943>. [PubMed: 9143635]
- Mateu-Gelabert P, Guarino H, Jessell L, Teper A. Injection and sexual HIV/HCV risk behaviors associated with nonmedical use of prescription opioids among young adults in New York City. *Journal of Substance Abuse Treatment*. 2015; 48(1):13–20. <http://dx.doi.org/10.1016/j.jsat.2014.07.002>. [PubMed: 25124258]
- McKnight I, Maas B, Wood E, Tyndall MW, Small W, Lai C, Kerr T. Factors associated with public injecting among users of Vancouver's supervised injection facility. *The American Journal of Drug and Alcohol Abuse*. 2007; 33(2):319–325. <http://dx.doi.org/10.1080/00952990601175102>. [PubMed: 17497555]
- Milloy MJ, Kerr T, Mathias R, Zhang R, Montaner JS, Tyndall M, Wood E. Non-fatal overdose among a cohort of active injection drug users recruited from a supervised injection facility. *Am J Drug Alcohol Abuse*. 2008; 34(4):499–509. <http://dx.doi.org/10.1080/00952990802122457>. [PubMed: 18584579]
- New York City Department of Health and Mental Hygiene. New York City: United Hospital Fund (UHF) Neighborhoods and NYC Zip Code Areas; 2006. [nyc.gov](http://nyc.gov)
- New York City Department of Health and Mental Hygiene. HIV Risk and Prevalence among New York City Injection Drug Users: 2009 National HIV Behavioral Surveillance Study. 2010 Retrieved from.
- New York City Department of Health and Mental Hygiene. HIV risk and prevalence among New York City injection drug users: 2012 National HIV behavioral surveillance study. 2013 Retrieved from.
- New York City Department of Health and Mental Hygiene. Article 81 of the NYC health code: Food Preparation and food establishments. 2015a §81.22b C.F.R.
- New York City Department of Health and Mental Hygiene. Unintentional drug poisoning (overdose) deaths involving opioids in New York City, 2000–2014. 2015b Retrieved from New York, NY.
- New York State Restaurant Association. [Safe sharps disposal and needle stick injury reporting training requirements for restaurant managers]. 2015
- Novak SP, Bluthenthal R, Wenger L, Chu D, Kral AH. Initiation of heroin and prescription opioid pain relievers by birth cohort. *American Journal of Public Health*. 2015; 106(2):298–300. <http://dx.doi.org/10.2105/AJPH.2015.302972>. [PubMed: 26691120]
- Otiashvili D, Latypov A, Kirtadze I, Ibragimov U, Zule W. Drug preparation, injection, and sharing practices in Tajikistan: A qualitative study in Kulob and Khorog. *Substance Abuse Treatment, Prevention, and Policy*. 2016; 11:21. <http://dx.doi.org/10.1186/s13011-016-0065-2>.
- Papenburg J, Blais D, Moore D, Al-Hosni M, Laferrière C, Tapiero B, Quach C. Pediatric injuries from needles discarded in the community: Epidemiology and risk of seroconversion. *Pediatrics*. 2008; 122(2):e487–e492. <http://dx.doi.org/10.1542/peds.2008-0290>. [PubMed: 18676535]
- Parkin, S. *Habitus and drug using environments: Health, place and lived-experience*. Ashgate Publishing Ltd; 2013.
- Parkin, S. *An applied visual sociology: Picturing harm reduction*. Farngate: Ashgate Publications Ltd; 2014.
- Parkin S. Colliding intervention in the spatial management of street-based injecting and drug-related litter within settings of public convenience (UK). *Space and Polity*. 2016; 20(1):75–94. <http://dx.doi.org/10.1080/13562576.2015.1077548>.
- Parkin S, Coomber R. Public injecting and symbolic violence. *Addiction Research & Theory*. 2009; 17(4):390–405. <http://dx.doi.org/10.1080/16066350802518247>.

- Parkin S, Coomber R. Fluorescent blue lights, injecting drug use and related health risk in public conveniences: Findings from a qualitative study of micro-injecting environments. *Health & Place*. 2010; 16(4):629–637. <http://dx.doi.org/10.1016/j.healthplace.2010.01.007>. [PubMed: 20167527]
- Parkin S, Coomber R. Injecting drug user views (and experiences) of drug-related litter bins in public places: A comparative study of qualitative research findings obtained from UK settings. *Health & Place*. 2011a; 17(6):1218–1227. <http://dx.doi.org/10.1016/j.healthplace.2011.08.002>. [PubMed: 21865072]
- Parkin S, Coomber R. Public injecting drug use and the social production of harmful practice in high-rise tower blocks (London, UK): A Lefebvrian analysis. *Health & Place*. 2011b; 17(3):717–726. <http://dx.doi.org/10.1016/j.health-place.2011.02.001>. [PubMed: 21440483]
- Petrar S, Kerr T, Tyndall MW, Zhang R, Montaner JSG, Wood E. Injection drug users' perceptions regarding use of a medically supervised safer injecting facility. *Addictive Behaviors*. 2007; 32(5): 1088–1093. <http://dx.doi.org/10.1016/j.addbeh.2006.07.013>. [PubMed: 16930849]
- Prussing C, Borschlegel K, Balter S. Hepatitis C surveillance among youth and young adults in New York City, 2009–2013. *Journal of Urban Health*. 2015; 92(2):387–399. <http://dx.doi.org/10.1007/s11524-014-9920-5>. [PubMed: 25450518]
- Rhodes T. The 'risk environment': A framework for understanding and reducing drug-related harm. *International Journal of Drug Policy*. 2002; 13(2):85–94. [http://dx.doi.org/10.1016/S0955-3959\(02\)00007-5](http://dx.doi.org/10.1016/S0955-3959(02)00007-5).
- 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. <http://dx.doi.org/10.1111/j.1360-0443.2006.01556.x>. [PubMed: 16968336]
- Rhodes T, Watts L, Davies S, Martin A, Smith J, Clark D, Lyons M. Risk, shame and the public injector: A qualitative study of drug injecting in South Wales. *Social Science & Medicine*. 2007; 65(3):572–585. [PubMed: 17475383]
- Rivera AV, DeCuir J, Crawford ND, Amesty S, Lewis CF. Internalized stigma and sterile syringe use among people who inject drugs in New York City, 2010–2012. *Drug and Alcohol Dependence*. 2014; 144:259–264. <http://dx.doi.org/10.1016/j.drugalcdep.2014.09.778>. [PubMed: 25307745]
- Ross NA, Wolfson MC, Dunn JR, Berthelot J-M, Kaplan GA, Lynch JW. Relation between income inequality and mortality in Canada and in the United States: Cross sectional assessment using census data and vital statistics. *BMJ: British Medical Journal*. 2000; 320(7239):898–902. [PubMed: 10741994]
- Russell FM, Nash MC. A prospective study of children with community-acquired needlestick injuries in Melbourne. *Journal of Paediatrics and Child Health*. 2002; 38(3):322–323. <http://dx.doi.org/10.1046/j.1440-1754.2002.t01-2-00859.x>. [PubMed: 12047709]
- Salmon AM, Thein H-H, Kimber J, Kaldor JM, Maher L. Five years on: What are the community perceptions of drug-related public amenity following the establishment of the Sydney Medically Supervised Injecting Centre? *International Journal of Drug Policy*. 2007; 18(1):46–53. <http://dx.doi.org/10.1016/j.drugpo.2006.11.010>. [PubMed: 17689343]
- Salmon AM, Dwyer R, Jauncey M, van Beek I, Topp L, Maher L. Injecting-related injury and disease among clients of a supervised injecting facility. *Drug and Alcohol Dependence*. 2009; 101(1–2): 132–136. <http://dx.doi.org/10.1016/j.drugalcdep.2008.12.002>. [PubMed: 19167171]
- Schoenbaum EE, Hartel D, Selwyn PA, Klein RS, Davenny K, Rogers M, Friedland G. Risk factors for human immunodeficiency virus infection in intravenous drug users. *New England Journal of Medicine*. 1989; 321(13):874–879. <http://dx.doi.org/10.1056/NEJM198909283211306>. [PubMed: 2770823]
- Seelye, KQ. Heroin epidemic increasingly seeps into public view. *New York Times*: 2016. Retrieved from [http://www.nytimes.com/2016/03/07/us/heroin-epi-demic-increasingly-seeps-into-public-view.html?\\_r=0](http://www.nytimes.com/2016/03/07/us/heroin-epi-demic-increasingly-seeps-into-public-view.html?_r=0) [March 6, 2016]
- 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. <http://dx.doi.org/10.1016/j.drugpo.2006.11.019>. [PubMed: 17689341]



- Small W, Van Borek N, Fairbairn N, Wood E, Kerr T. Access to health and social services for IDU: The impact of a medically supervised injection facility. *Drug and Alcohol Review*. 2009; 28(4): 341–346. <http://dx.doi.org/10.1111/j.1465-3362.2009.00025.x>. [PubMed: 19594786]
- Sohn J-W, Kim B-G, Kim S-H, Han C. Mental health of healthcare workers who experience needlestick and sharps injuries. *Journal of Occupational Health*. 2006; 48(6):474–479. <http://dx.doi.org/10.1539/joh.48.474>. [PubMed: 17179640]
- Stoltz J-A, Wood E, Small W, Li K, Tyndall M, Montaner J, Kerr T. Changes in injecting practices associated with the use of a medically supervised safer injection facility. *Journal of Public Health*. 2007; 29(1):35–39. <http://dx.doi.org/10.1093/pubmed/fdl090>. [PubMed: 17229788]
- Strathdee SA, Shoptaw S, Dyer TP, Quan VM, Aramrattana A. The Substance Use Scientific Committee of the HIV Prevention Trials Network. Towards combination HIV prevention for injection drug users: Addressing addictophobia, apathy and inattention. *Current Opinion in HIV and AIDS*. 2012; 7(4):320–325. <http://dx.doi.org/10.1097/COH.0b013e32835369ad>. [PubMed: 22498479]
- Substance Abuse and Mental Health Services Administration (SAMHSA). Results from the 2012 national survey on drug use and health: Summary of national findings. 2013 Retrieved from HHS.
- Suen L, Huang H, Lee H. A comparison of convenience sampling and purposive sampling. *The Journal of Nursing*. 2014; 61(3):105–111.
- Sullivan, M. *Getting paid: Youth crime and work in the inner city*. Ithaca, NY: Cornell University Press; 1989.
- Topp L, Iversen J, Conroy A, Salmon AM, Maher L. on behalf of the Collaboration of Australian NSPs. Prevalence and predictors of injecting-related injury and disease among clients of Australia's needle and syringe programs. *Australian and New Zealand Journal of Public Health*. 2008; 32(1):34–37. <http://dx.doi.org/10.1111/j.1753-6405.2008.00163.x>. [PubMed: 18290911]
- Tukey JW. Comparing individual means in the analysis of variance. *Biometrics*. 1949; 5(2):99–114. <http://dx.doi.org/10.2307/3001913>. [PubMed: 18151955]
- United States Census Bureau. 2010–2014 American community survey 5-year estimates. 2016. Retrieved from [factfinder.census.gov](http://factfinder.census.gov)
- Weeks MR, Clair S, Singer M, Radda K, Schensul JJ, Wilson DS, Knight G. High Risk drug use sites, meaning and practice: Implications for AIDS prevention. *Journal of Drug Issues*. 2001; 31(3):781–808. <http://dx.doi.org/10.1177/002204260103100314>.
- Wheeler, E., Jones, T., Gilbert, M., Davidson, P. Opioid overdose prevention programs providing naloxone to laypersons—United States. 2015. 2014 Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6423a2.htm>
- Wood E, Kerr T, Small W, Li K, Marsh DC, Montaner JSG, Tyndall MW. Changes in public order after the opening of a medically supervised safer injecting facility for illicit injection drug users. *CMAJ: Canadian Medical Association Journal*. 2004; 171(7):731–734. <http://dx.doi.org/10.1503/cmaj.1040774>. [PubMed: 15451834]
- Wood E, Tyndall MW, Lai C, Montaner JSG, Kerr T. Impact of a medically supervised safer injecting facility on drug dealing and other drug-related crime. *Substance Abuse Treatment, Prevention, and Policy*. 2006; 1:13–13. <http://dx.doi.org/10.1186/1747-597X-1-13>.
- Wood E, Tyndall MW, Zhang R, Montaner JSG, Kerr T. Rate of detoxification service use and its impact among a cohort of supervised injecting facility users. *Addiction*. 2007; 102(6):916–919. <http://dx.doi.org/10.1111/j.1360-0443.2007.01818.x>. [PubMed: 17523986]
- Wood E, Tyndall MW, Zhang R, Stoltz J-A, Lai C, Montaner JSG, Kerr T. Attendance at supervised injecting facilities and use of detoxification services. *New England Journal of Medicine*. 2006; 354(23):2512–2514. <http://dx.doi.org/10.1056/NEJMc052939>. [PubMed: 16760459]
- World Health Organization (Producer). Health care worker health and safety: Preventing needlestick injury and occupational exposure to bloodborne pathogens. protecting healthcare workers: Preventing needlestick injuries toolkit. Nov 26.2015 [Powerpoint].

**Table 1**Descriptive statistics of managers who encountered drugs use in their business bathroom ( $n = 50$ ).

	<b>Percent (number of businesses)</b>	<b>Range (median)</b>
Managers that encountered drug use ...	58% ( $n = 50/86$ )	1–300 average encounters per month, median = 3
Managers that found paraphernalia...	94% ( $n = 47/50$ )	–
Managers that found syringes ...	34% ( $n = 17/50$ )	–
Managers that found crack pipes...	22% ( $n = 11/50$ )	–
Managers that called 911 for drug encounters ...	24% ( $n = 12/49$ )	1–30 calls per 6 months, median=3
Managers that called 911 because someone was unresponsive from drug use ...	14% ( $n = 7/50$ )	1–24 per 6 months, median=2
Managers that received customer complaints about drug use...	44% ( $n = 22/50$ )	–
Managers that have training in overdose reversal and naloxone...	10% ( $n = 5/50$ )	–
Managers that believe overdose reversal and naloxone training would be useful...	64% ( $n = 30/47$ )	–

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 2**

Total number of businesses surveyed by Tier.

Types of businesses	Total	Tier I Highest overdose death rates	Tier II High overdose death rates	Tier III Moderate overdose death rates	Tier IV Low overdose death rates	Tier V Lowest overdose death rates
Fast-food	50% ( <i>n</i> = 25/50)	73% ( <i>n</i> = 8/11)	33% ( <i>n</i> = 1/3)	39% ( <i>n</i> = 9/23)	60% ( <i>n</i> = 6/10)	33% ( <i>n</i> = 1/3)
Coffee shop	4% ( <i>n</i> = 2/50)	-	-	9% ( <i>n</i> = 2/23)	-	-
Food market	6% ( <i>n</i> = 3/50)	18% ( <i>n</i> = 2/11)	-	-	10% ( <i>n</i> = 1/10)	-
Clothing store	6% ( <i>n</i> = 3/50)	-	33% ( <i>n</i> = 1/3)	9% ( <i>n</i> = 2/23)	-	-
Shopping mall	-	-	-	-	-	-
Restaurant	24% ( <i>n</i> = 12/50)	-	33% ( <i>n</i> = 1/3)	30% ( <i>n</i> = 7/23)	20% ( <i>n</i> = 2/10)	67% ( <i>n</i> = 2/3)
Bodega	4% ( <i>n</i> = 2/50)	-	-	4% ( <i>n</i> = 1/23)	10% ( <i>n</i> = 1/10)	-
Laundromat	6% ( <i>n</i> = 3/50)	9% ( <i>n</i> = 1/11)	-	9% ( <i>n</i> = 2/23)	-	-

**Table 3**

Managers who encountered drug use in their business bathroom ( $n = 50$ ) analysed by Tiers.

Questions	Tier I (Highest overdose death rates)	Tier II (High overdose death rates)	Tier III (Moderate overdose death rates)	Tier IV (Low overdose death rates)	Tier V (Lowest overdose death rates)
Managers that encountered drug use...	73% ( $n = 11/15$ ) 1–300 encounters, median = 3	75% ( $n = /4$ ) 1–2 encounters, Median = 1	61% ( $n = 23/38$ ) 1–30 encounters, median = 3	43% ( $n = 10/23$ ) 1–7 encounters, median = 3	50% ( $n = 3/6$ ) 1–5 encounters, median = 3
Range, median (avg. monthly encounters)	10 0% ( $n = 11/11$ )	67% ( $n = 2/3$ )	91% ( $n = 21/23$ )	90% ( $n = 9/10$ )	100% ( $n = 3/3$ )
Managers that found paraphernalia ...	82% ( $n = 9/11$ )	33% ( $n = 1/3$ )	30% ( $n = 7/23$ ) <sup>a</sup>	0% ( $n = 0/10$ ) <sup>a</sup>	0% ( $n = 0/3$ ) <sup>a</sup>
Managers that found syringes...	18 % ( $n = 2/11$ )	33% ( $n = 1/3$ )	26% ( $n = 6/23$ )	10% ( $n = 1/10$ )	33% ( $n = 1/3$ )
Managers that found crack pipes...	45% ( $n = 5/11$ ) 2–30 calls, Median=22	33% ( $n = 1/3$ ) 1 call –	14% ( $n = 3/22$ ) 0–4 calls, median=2.5	20% ( $n = 2/10$ ) 1–10 calls, median=5.5	33% ( $n = 1/3$ ) 1 call –
Managers that called 911 for drug encounters...	45% ( $n = 5/11$ )	33% ( $n = 1/3$ )	4% ( $n = 1/23$ )	0% ( $n = 0/10$ )	0% ( $n = 0/3$ )
Managers that called 911 because someone was unresponsive from drug use...	82% ( $n = 9/11$ )	33% ( $n = 1/3$ )	43% ( $n = 10/23$ )	20% ( $n = 2/10$ )	0% ( $n = 0/3$ )
Managers that received customer complaints about drug use ...	18 % ( $n = 2/11$ )	33% ( $n = 1/3$ )	5% ( $n = 1/22$ )	0% ( $n = 0/10$ )	0% ( $n = 0/3$ )
Managers that have training in overdose recognition and naloxone training ...	70% ( $n = 7/10$ )	67% ( $n = 2/3$ )	67% ( $n = 14/21$ )	40% ( $n = 4/10$ )	100% ( $n = 3/3$ )
Managers that believe overdose recognition and naloxone training would be useful...					

<sup>a</sup>The mean difference is significant at the 0.05 level.