



Research Paper

Changes in public order after the opening of an overdose monitoring facility for people who inject drugs



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ABSTRACT

Background: In the face of an increasingly fatal opioid crisis, Boston Health Care for the Homeless Program (BHCHP) opened the Supportive Place for Observation and Treatment (SPOT), a unique low-threshold harm reduction program for monitoring people who have injected drugs and are at imminent risk of overdose. This study examines the impact of the opening of the SPOT program on measures of injection drug-related public order in the neighborhood surrounding the facility.

Methods: Data was collected at 10 weeks prior and 12 weeks post SPOT implementation on: number of over-sedated individuals in public, publicly discarded syringes, publicly discarded injection-related litter, and instances of active injection drug use or exchange of drugs. Changes were evaluated using Poisson log-linear regression models. Potential confounders such as weather and police presence were measured and controlled for.

Results: The average number of over-sedated individuals observed in public significantly decreased by 28% (4.3 [95% Confidence Interval (CI) 2.7–6.9] v 3.1 [CI 1.4–6.8]) after SPOT opened. The opening of SPOT did not have a significant effect on the other measures of public order. The daily average number of publicly discarded syringes (28.5 [CI 24.5–33.1] v 28.4 [CI 22.0–36.5]), pieces of publicly discarded injection-related litter (376.3 [CI 358.6–394.8] v 375.0 [CI 345.8–406.6]), and observed instances of active use or exchange of drugs (0.2 [CI 0.1–0.9] v 0.1 [CI 0.0–0.1]) were not statistically significantly different after the opening of SPOT.

Conclusions: The opening of SPOT was associated with a significant decrease in observed over-sedated individuals. Other measures of injection-drug related public order did not improve or worsen with the opening of SPOT, however, they have been shown to improve with the implementation of a supervised injection facility.

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Background

The United States is experiencing an opioid overdose epidemic (Rudd, Aleshire, Zibbell, & Gladden, 2016). The national death rate from drug overdoses has increased 137% since 2000, including a 200% increase in the rate of overdose deaths involving opioids (Rudd et al., 2016). In Massachusetts, the opioid-related death rate has increased 350% since 2000, with a sharp rise beginning in 2011 (Health, 2016). In hospitals in the city of Boston, from 2007 to 2012, there was a significant increase in unintentional overdose/poisoning patient encounters for opioids (Commission, 2016).

In Boston, individuals experiencing homelessness have been disproportionately affected by this epidemic of opioid use disorder and overdose deaths (Baggett et al., 2013). One study showed that adults under the age of 45 experiencing homelessness had an overall death rate 16 to 24 times higher than in the Massachusetts general population (Baggett et al., 2013). Another showed that drug-attributable mortality rates in people experiencing homelessness were 8 to 17 times higher than the Massachusetts general population (Baggett et al., 2014). Of the overdose deaths among a cohort of individuals experiencing homelessness, 81% involved opioids and 40% involved multiple drugs (Bauer, Brody, Leon, & Baggett, 2016). It has also been shown that people who lack housing are at a higher risk for using alone (Bauer et al., 2016; McKnight et al., 2007), which is a risk factor for overdose (Jozaghi & Andresen, 2013; Milloy et al., 2010). Public drug use increases risk

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for overdose (Van Beek, Kimber, Dakin, & Gilmour, 2004) and unsafe situations like robbery (Jozaghi & Andresen, 2013) and violence (Fairbairn, Small, Shannon, Wood, & Kerr, 2008).

Boston Health Care for the Homeless Program (BHCHP) implemented a unique harm reduction intervention to better manage overdoses. The Supportive Place for Observation and Treatment (SPOT) opened at BHCHP in April of 2016 (Gaeta, Bock, & Takach, 2016). SPOT is a facility for up to 10 individuals who are intoxicated from the use of opioids and other substances to be medically monitored for signs of an overdose and provide rapid intervention with naloxone and/or supplemental oxygen when an overdose occurs (Gaeta et al., 2016). Consumption of illegal substances is not permitted within the facility. SPOT serves as an alternative to being over-sedated, alone, and at risk after using substances on the street or elsewhere in public. More details of the operations of the program have been described elsewhere (Gaeta et al., 2016). The goals of the program are to reduce the opioid overdose fatality rate in the area, engage high-risk individuals in care and treatment, and address the impact of substance use disorder (SUD) on patients and the neighborhood.

A distinct effect of the opioid crisis in the area is the burden of public use on the surrounding neighborhood. Public injection drug use and its consequences on public order and public health (e.g. publicly discarded syringes) are of great concern. The area in which SPOT was opened is known as an epicenter of public drug activity in Boston. In internal evaluations, the SPOT program has been shown to directly connect patients to health care and addiction treatment services, engage a hard-to-reach and high-risk patient population, and provide a low-threshold overdose prevention intervention. As part of the evaluation of SPOT, the following study assesses the impact of the facility on injection-drug-related public order in the surrounding area.

Methods

Study design to assess public order before and after the opening of SPOT was modeled after the Wood et al. (2004) study in Vancouver, Canada that measured changes in public order following the opening of a SIF. Measures and data collection were modified to fit the intervention.

Data collection involved surveying three predetermined routes that, together, comprised a comprehensive walking course of the publicly accessible area within a 500-m radius of the planned intervention. Each of the three routes was completed at the same time once weekly. Each observation session was performed by four data collectors, with two lead collectors who were present throughout every collection period to promote consistency. Two data collectors from each observation session were members of the Boston Public Health Commission (BPHC) Mobile Sharps Team – specifically trained and tasked to recover publicly discarded syringes. Counts of injection-drug related measures of public order were documented. Data was collected for ten weeks before the opening of the SPOT facility and for twelve weeks after.

Four indicator measures of public order were measured. Instances of observed public use or exchange of drugs, publicly discarded syringes, and publicly discarded injection drug related litter were identified as measures of public drug use, as measured by Wood in 2004. In addition to being counted, syringes were also recovered and safely discarded at each observation session eliminating repeat documentation at successive data collection sessions.

As publicly discarded syringes alone would not provide a clear indication of public drug use, injection drug related litter was chosen as a measure to capture the full picture of injection drug use in the area. Drug related litter included syringe caps, tourniquets, cookers (containers known locally to be used to mix and heat

substances before injection), alcohol swabs, clean cotton (used for filtering substances), and sterilized water containers. Improvised drug use paraphernalia such as soda cans or spoons likely used as cookers were not counted. Consequently, our estimates are likely conservative. Litter was not recovered during data collection. Each observed piece of litter was counted at each data collection session.

The final measure of drug related public order was over-sedated individuals in public. The area in which the study was conducted has a concentration of addiction and homelessness services and fatal and non-fatal overdoses are common. Over-sedated individuals in public, especially those at risk of or experiencing an overdose in public, are the target population for the SPOT facility's services, and represented a measure of direct relevance to the new programming. An over-sedated individual was defined as a person with a decreased level of consciousness. Commonly observed signs of over-sedation in this study were: inability to stand up, keep balance, or keep eyes open, and slumped appearance in public. Additional behaviors that implied impaired judgement were also taken into consideration when applicable, such as crossing a dangerous intersection slowly and without looking, standing and swaying in one place for too long, and difficulty talking or communicating.

Because public drug use may be impacted by police presence (Wood, Spittal et al., 2004) and weather conditions, data was also collected on other potential explanatory variables that included: number of uniformed police patrols observed during data collection sessions, rainfall amounts (in inches) on days of data collection publicly available from the Boston Water and Sewer Commission, (Walsh and Vitale, 2016) the observed presence or absence of snow coverage, and outdoor temperature during observation sessions as reported by the Weather Channel that also incorporated the effects of wind chill and humidity.

Finally, publicly-accessible data from the City of Boston's non-emergency reporting service (BOS:311) was used to compare trends of counts of reported publicly discarded syringes outside the 500-m observation area in the same timeframe. (The purpose of the BOS:311 program is for anyone to report by phone call the presence of a publicly discarded syringe within City limits.)

Data was entered into a Microsoft Access database. Double data entry was used for quality control. Data was managed in Microsoft Excel and analyzed in SAS 9.4.

Analysis

The statistical protocol used in the analysis was modeled after the analysis plan of Wood 2004 to examine the potential relationship between the public order measures and the operation of the SPOT facility. The mean daily numbers of participants who used SPOT and each of the four public order measures were calculated. To test for changes in each of the measures of public order before and after the opening of SPOT, pre- and post- daily averages were compared using the Wilcoxon Rank Sum test for non-normally distributed data. The correlation between SPOT use and each of the public order measures was evaluated using Spearman's correlation coefficient. Poisson log-linear models were fit with the daily count of each of the public order and potential explanatory measures. The independent variables were examined in unadjusted regression models and then adjusted for potential explanatory variables and study period. Parameter estimates from the unadjusted and adjusted regression models were used to calculate the predicted mean daily numbers of each public order measure in the two study time periods. To create a proxy control of the 500-m radius data collection area, publicly available data from the city's public syringe clean-up report service was analyzed. All *p* values were 2-sided with a significance level of $p < .05$.

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