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The Melbourne safe-injecting room attracted people most in need of its service

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Abstract

Introduction

In 2018, the first Medically Supervised Injecting Room (MSIR) in Melbourne, Australia was officially opened. This study assessed whether the Melbourne MSIR has attracted people who inject drugs (PWID) who are vulnerable and engage in drug-related behaviours associated with increased risk of morbidity and mortality.

Methods

Cross-sectional analysis of frequency of MSIR use during the first 18 months after opening (July 2018 – December 2019) among 658 PWID participating in the Melbourne Injecting Drug User Cohort Study (SuperMIX). To examine differences between no MSIR use, infrequent use (<50% injections within the MSIR) and frequent use (≥50% of injections within the MSIR), relative risk ratios were estimated using bivariate multinomial logistic regression analyses and post-estimation Wald tests. Analyses were conducted in 2020.

Results

Four hundred and fifty-one (68%) participants reported no MSIR use, 142 (22%) reported infrequent use, and 65 (10%) reported frequent use. Participants who reported either infrequent or frequent MSIR use were more socially vulnerable (e.g., more often homeless) and more likely to report risky drug-related behaviours and poor health outcomes than those who reported no use. Participants who reported frequent use of the MSIR were also more likely to live close to the facility than those reporting infrequent use.

Conclusions

The Melbourne MSIR attracted socially-marginalized PWID most at risk of harms related to injecting drug use and, therefore, most in need of the service. To determine the long-term impact of MSIR use on key health outcomes such as overdose, future studies should consider differences in vulnerability and risk behaviour of PWID who use the MSIR when examining outcomes associated with use of the facility.

Introduction

Drug-related overdose deaths have been on the rise in the US,[1,2] Canada,[3] Europe,[4] and Australia;[5] including Victoria, a state in the south-east Australia of which Melbourne is the capital city. People who inject drugs (PWID) are at elevated risk of preventable premature mortality from fatal overdose and multiple other causes, including invasive infections, skin and soft tissue injuries, and blood-borne viral infections such as HIV and hepatitis C and B.[6] In the US, of the more than 70,000 drug overdose deaths that occurred in 2017, almost 68% involved prescription and/or illicit opioids,[7] of which more than half involved synthetic opioids other than methadone (but including fentanyl), and 33% involved heroin. Although the exact proportion that involve opioid injection is unknown, experience from other countries suggest many are likely to involve PWID; for example, in Australia, over the period 2007 - 2017 an estimated 53% of all opioid overdose deaths and 90% of all heroin-related deaths involved PWID.[8]

PWID are also vulnerable to a range of other negative health and social outcomes, including anxiety and depression, drug dependence, cardiovascular and cerebrovascular complications, homelessness, incarceration, stigma and discrimination.[9,10] Similar to other public health interventions, such as opioid agonist therapy (OAT) and needle and syringe programs, supervised injecting facilities (SIFs) have been implemented in many parts of the world, in response to the emergence of local drug-related harms, including in Sydney, Australia,[11] and a number of cities in Canada,[12] and Europe.[13] SIFs have been shown to reduce overdose-related morbidity and mortality, moderate drug-related risk behaviors such as syringe sharing and public injection, and improve public amenity.[14] Nevertheless, with the notable exception of Canada, where a number of SIFs and related overdose prevention sites have been

implemented in response to the overdose crisis,[15] SIF implementation has been patchy and there are no legal SIFs in the US despite the opioid overdose crisis.[16]

SIFs are designed to attract high-risk, socially vulnerable PWID. SIFs attract PWID who are likely to be unemployed,[11] homeless or residing in unstable housing,[11,17,18] have low levels of education[19] or been incarcerated.[11] Previous research has shown that PWID who use SIFs differ from those who do not. PWID who use SIFs are more likely to be male,[19] older,[11,18] to report risk behaviors such as a recent overdose,[18] public injecting,[11,18] or injecting daily or more frequently,[11,17-21] and to have been exposed to hepatitis C virus (HCV)[19] than PWID who do not use SIFs. PWID using SIFs are also more likely to have a history of drug treatment[11] and less likely to have injected with borrowed syringes/needles.[19] In addition, compared to PWID who use SIFs less frequently or not at all, those who use SIFs more *frequently* are generally younger,[22] and more likely to be recently incarcerated,[22] inject in public,[22] inject daily,[22] and less likely to have experienced violence.[23] Despite concerns about potential "honeypot" effects,[24] data from Vancouver indicate that established SIFs mostly service people from the local neighbourhood.[20,21]

In October 2017, in response to recommendations from a coronial investigation into heroin-related harms and deaths, the state government of Victoria in Melbourne, Australia, announced a two-year trial of a SIF in Melbourne. In July 2018, the Medically Supervised Injecting Room (MSIR) officially opened in an inner-city suburb of Melbourne, on the site of the North Richmond Community Health Centre. In line with the operation of sanctioned SIFs (e.g., in Sydney and Vancouver) and unsanctioned SIFs (e.g., in the US), the MSIR provides a safe environment for PWID to inject illicit drugs with sterile equipment under the

supervision of trained staff. Clients are also offered education on safer drug consumption practices, emergency intervention in the event of an overdose, and referrals to drug treatment and other health services. North Richmond was chosen because of its active street-based drug market[25] and the high number of heroin-related deaths over 2014–2018.[26] The MSIR aims to improve the health of clients by reducing overdoses and associated use of services and improving service delivery and uptake, while increase public amenity by reducing the number of injections occurring in public spaces around the MSIR.

The data collected from the Melbourne Injecting Drug User Cohort Study (SuperMIX) was analyzed, a prospective observational study of PWID ongoing since 2008.[27] The present study describes a comparison of the demographic and behavioral characteristics of PWID attending the MSIR with those of other PWID in Melbourne who did not use the facility. Following Kennedy et al.,[22] this study compared PWID who had not used the MSIR, those who reported using it infrequently, and those who reported using it frequently, to test whether the MSIR was attracting PWID who engage in drug-related behaviors known to be associated with higher risk of morbidity, mortality and infectious diseases.[6]

Methods

SuperMIX

The SuperMIX study follows a cohort of PWID recruited across Melbourne, including North Richmond, with initial recruitment undertaken in 2008 and further recruitment from 2017 onwards. Eligibility criteria for the overall cohort include residing in Melbourne, being aged 18 years or over, having injected either heroin or amphetamines at least six times in the six

months prior to entering the study, having a valid Medicare number (Australia's universal health insurance scheme; needed for data linkage to health records) and provision of informed consent. Initial age criteria aiming to recruit younger PWID (<30 years) and not receiving OAT at the time of recruitment were relaxed over time.

Interviews are scheduled annually, and include questions about demographic characteristics, drug use history, and health service utilization, as well as use of the MSIR. Written informed consent to access Medicare and other linked data is obtained from all participants. Blood samples collected by interviewers at the same time as the interview are tested for HIV, hepatitis B and HCV infection. Most interviews take place in and around the main drug markets in the greater metropolitan area of Melbourne (St Kilda, Footscray, Dandenong, Collingwood/Fitzroy/Richmond, Melbourne central business district, and Frankston). Participants are reimbursed $30 for their time and out-of-pocket expenses, with an extra $10 if they provide a venous blood sample (from 2011 onwards). The study is approved by The Victorian Department of Health Human Research Ethics Committee (#545891, #1136908). Further cohort details are available elsewhere.[27-29]

Study sample

For this study the analyses were restricted to participants' first interview in the 18 months after the MSIR opened (July 2018 – December 2019; n=746). Individuals were excluded from the analysis sample if they: 1) did not respond to the MSIR questions (n=38; 5%), 2) ceased injecting drugs in the 12 months prior to their interview (n=34; 5%), 3) reported not being allowed to use the facility (e.g., pregnant women) (n=5; 0.6%), or 4) they were

interviewed over the phone and were unable to provide complete data on either their place of residence or interview location (n=11; 1%).

Outcome measure

Coinciding with the opening of the MSIR, from July 2018 onwards SuperMIX interviews included questions related to the use of the MSIR. The main variable of interest for the current study is "frequency of MSIR use". Frequency of MSIR use was determined based on the reported percentage of injections taking place in the facility within the month prior to the interview. Participants were asked, "What proportion of your injections took place in the MSIR in the last month?". Participants were classified as making "no use" of the MSIR (n=451) if they indicated they had not used it (n=388) or had not heard of it (n=63), "infrequent use" (n=142) if they reported less than 50% of their injections within the MSIR, or "frequent use" (n=65) if they reported 50% or more of their injections within the MSIR.

Independent variables

The current study examined the association of MSIR use with a range of socio-demographic characteristics including age at time of interview (<35 years, 35–45 years, >45 years), gender (male, female), current employment status (unemployed, employed), current housing status (unstable, stable or homeless), current living conditions (living alone, with relatives, with friends, with housemates), educational level (did not complete year 10, completed year 10 or higher), identification as Aboriginal or Torres Strait Islander (yes, no), being a parent (yes, no). Unstable housing was defined as living in a boarding house, squat, couch surfing or supported accommodation (crisis/medium term).[30] This study also assessed the association of MSIR use with whether participants were living in North Richmond or suburbs immediately

adjacent to and up to two suburbs away from North Richmond, where the MSIR is located (yes, no), as a measure of distance required to travel to the MSIR.

This study also examined the association of MSIR use with reported drug using behaviors typically associated with higher risk of morbidity, mortality and risk of infection, including total frequency of drug injections (derived from a reported injections of all 24 drugs included in the questionnaire) in the week prior to the interview (8 or more injections, 1–7 injections, none), receiving OAT (methadone, buprenorphine-naloxone or buprenorphine; yes, no), reporting a non-fatal overdose associated with heroin, other opiates or methamphetamine since the previous interview (yes, no), borrowing needles or syringes in the month prior to the interview (yes, no), public injecting of last purchase of heroin or methamphetamine (yes, no), ever receiving a positive HCV antibody or RNA test result (yes, no), and having been incarcerated in the 12 months prior to the interview (yes, no).

Statistical analyses

Descriptive statistics were used to summarize the characteristics of study participants by frequency of MSIR use. To examine differences between no use, infrequent use and frequent use of the MSIR, this study estimated relative risk ratios using bivariate multinomial logistic regression analyses, with no use as the reference category. Where differences in effect were observed between frequent and infrequent use, post-estimation Wald tests were conducted to test the differences in effect of each independent variable between these two outcome categories. Analyses were performed using Stata version 15.

Results

Of the 658 participants, 451 (68%) reported that they had not used the MSIR, 142 (22%) reported infrequent use of the MSIR, and 65 (10%) reported frequent use of the MSIR.

Infrequent and frequent use of the MSIR versus no use

SuperMIX participants reporting infrequent MSIR use were more socially vulnerable, more likely to report drug-related risk behaviors, and to have poorer self-reported health outcomes than those who reported that they had not used the MSIR (Table 1). Compared to no MSIR use, infrequent users were younger on average, and more likely to reside in suburbs around the MSIR, be unemployed, homeless, receiving OAT, live by themselves, identify as Aboriginal or Torres Strait Islander, inject daily or more frequently, inject in public, report having overdosed since their last follow-up, report having tested positive for HCV infection, and have recently been incarcerated. The pattern for frequent use versus no use of the MSIR was the same, except that the difference in public injecting and testing positive for exposure to HCV failed to reach statistical significance.

Frequent use versus infrequent use

Post-estimation Wald tests showed that compared to participants who infrequently used the MSIR, frequent users were more likely to live in suburbs around the MSIR (Wald test: $\chi2(1) = 4.32$; $p = 0.04$), live by themselves ($\chi2(1) = 10.74$; $p < 0.01$), and report recent incarceration ($\chi2(1) = 5.24$; $p = 0.02$), but less likely to report injecting in public ($\chi2(1) = 15.82$; $p < 0.01$).

Discussion

The study findings show that during its first 18 months of operation, the Melbourne MSIR was used by 32% of 658 PWID enrolled in SuperMIX who were interviewed during that time. To maximize the health and social benefits of the MSIR, the facility needs to attract PWID at greatest risk. Consistent with what has been observed in injecting facilities in Sydney, Vancouver and Barcelona,[11,17-22] this study found that participants who reported any MSIR use were more socially vulnerable across a range of domains, were more likely to report high-risk behaviors such as frequent injection and injecting in public, and recent overdose, but were less likely to report receiving OAT than those not reporting MSIR use.

For some of the exposure variables this study found a higher-risk profile for participants who reported frequent MSIR use (compared to no use), consistent with recent observations in Vancouver,[22] including living alone, public injecting and recent incarceration. Factors such as injecting alone[31] or in public[32] and recent release from prison[33] are all associated with heightened risk of fatal and non-fatal overdose. More frequent use of the MSIR by these participants suggests a potentially significant future benefit of MSIR in preventing overdose mortality. Further investigation using longitudinal data available from SuperMIX in coming years will enable us to determine the impact of MSIR use on key drug-related harms such as overdose. The study findings highlight the need to factor in differences in the vulnerability and risk behavior of PWID when examining outcomes associated with use of SIFs.

Comparing those who frequently used the MSIR to those who used it less frequently, the present study found that participants who used the MSIR more frequently were more likely to live in Richmond and surrounding suburbs. Living distant from an SIF is a known barrier to

its use.[17] Among those who reported not using the MSIR, only 12% lived in and around the suburb of North Richmond. These findings underscore the limited geographic coverage of a single SIF site in a city as large as Melbourne. The Victorian Government has recognized the need for additional SIF sites, and has committed to opening a second site.[34] In this context, it is important to note that participants who reported frequently using the facility were less likely to report injecting in public than those who had used it less frequently, pointing to a clear public amenity and wider community benefit that needs close monitoring.

A limitation of this study is that temporality cannot be determined as the reported behaviors could also be the outcomes of using the MSIR and thus no causal inferences can be drawn from the data. Also, as this study used data from a non-random sample, findings cannot be generalized to other samples of PWID. However, with a mean age of 41, and percentages of 65% male and 32% in unstable housing, the key socio-demographic characteristics of SuperMIX participants who reported use of the MSIR were similar to those observed in clients of the Melbourne MSIR overall (mean age 39, 72% male and 35% in unstable housing), suggesting that the SuperMIX cohort was largely representative of MSIR clients.[34] Another limitation relates to using data from the first interview after opening of the MSIR. The dates of participants' first interview after the MSIR opened differed widely, so time between the opening and the interview date may have differentially affected behaviors. Future use of prospective data to examine the stability of use of the MSIR is therefore warranted. In addition, the data used are susceptible to reporting biases, including social desirability bias. This could be particularly the case for participants interviewed in the proximity of the MSIR.

Conclusions

In the first 18 months of the MSIR's operation in Melbourne, almost a third of PWID enrolled in a Melbourne-wide cohort had used the facility. The study findings show that the MSIR has been successful in attracting socially vulnerable PWID at high risk of harm and therefore most in need of this service, adding further to the evidence that SIFs attract those most likely to benefit from them. This vulnerability needs to be considered in examining impacts of the facility on harms related to injecting drug use. Further prospective analyses of this cohort, modelled on similar work using prospective cohort studies in Vancouver, are needed to determine the causal impacts of the MSIR on clients' health and social outcomes.

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Table 1. Characteristics associated with infrequent and frequent use of the Melbourne supervised injecting facility among people who inject drugs in the SuperMIX cohort (July 2018 – December 2019) using bivariate multinomial regression analyses

Characteristic	No use[a], n=451	Infrequent use, n=142			Frequent use, n=65			Overall p-value
			RRR (95% CI)	p-value		RRR (95% CI)	p-value	
Age at interview								
34 and younger	93 (20.6%)	45 (31.7%)	1		23 (35.4%)	1		**0.004**
35-45	243 (53.9%)	75 (52.8%)	0.64 (0.41-0.99)	0.05	32 (49.2%)	0.53 (0.30-0.96)	**0.04**	
46 and older	115 (25.5%)	22 (15.5%)	0.40 (0.22-0.71)	**0.002**	10 (15.4%)	0.35 (0.16-0.78)	**0.01**	
Sex								
Female	147 (32.7%)	46 (32.4%)	1		19 (29.2%)	1		0.85
Male	302 (67.3%)	96 (67.6%)	1.02 (0.68-1.52)	0.94	46 (70.8%)	1.18 (0.67-2.08)	0.57	
Employment status								
Employed	72 (16.0%)	6 (4.2%)	1		3 (4.6%)	1		**<0.001**
Unemployed	379 (84.0%)	136 (95.8%)	4.31 (1.83-10.13)	**0.001**	62 (95.4%)	3.93 (1.20-12.85)	**0.02**	
Living in suburbs around the MSIR								
No	380 (88.2%)	92 (73.6%)	1		35 (58.3%)	1		**<0.001**
Yes	51 (11.8%)	33 (26.4%)	2.67 (1.63-4.37)	**<0.001**	25 (41.7%)	5.32 (2.95-9.61)	**<0.001**	
Housing status								
Stable	235 (52.3%)	65 (46.1%)	1		25 (39.7%)	1		**<0.001**
Unstable	214 (38.3%)	45 (31.9%)	0.95 (0.62-1.45)	0.80	22 (34.9%)	1.20 (0.66-2.20)	0.60	
Homeless	42 (9.3%)	31 (22.0%)	2.67 (1.56-4.58)	**<0.001**	16 (25.4%)	1.29 (1.76-7.27)	**<0.001**	
Living conditions								
With others[b]	296 (67.0%)	77 (57.9%)	1		20 (32.3%)	1		**<0.001**
Alone	146 (33.0%)	56 (42.1%)	1.47 (0.99-2.19)	0.06	42 (67.7%)	4.26 (2.41-7.51)	**<0.001**	
Education								
Year 10 or higher	293 (69.8%)	90 (67.2%)	1		41 (65.1%)	1		0.69
<Year 10	127 (30.2%)	44 (32.8%)	1.13 (0.74-1.71)	0.57	22 (34.9%)	1.24 (0.71-2.16)	0.45	
Aboriginal and Torres Strait Islander								
No	398 (88.4%)	99 (70.7%)	1		50 (76.9%)	1		**<0.001**
Yes	52 (11.6%)	41 (29.3%)	3.17 (1.99-5.04)	**<0.001**	15 (23.1%)	2.30 (1.20-4.38)	**0.01**	
Total drug injections in week prior to interview								
None	107 (23.7%)	15 (10.6%)	1		7 (10.9%)	1		**<0.001**
1-7	204 (45.2%)	44 (31.2%)	1.54 (0.82-2.89)	0.18	13 (20.3%)	0.97 (0.38-2.51)	0.96	
8 or more	140 (31.0%)	82 (58.2%)	4.18 (2.28-7.65)	**<0.001**	44 (68.8%)	4.80 (2.08-11.09)	**<0.001**	
Receiving OAT								
No	223 (49.4%)	83 (58.5%)	1		46 (70.8%)	1		**0.002**
Yes	228 (50.6%)	59 (41.5%)	0.70 (0.47-1.02)	0.06	19 (29.2%)	0.40 (0.23-0.71)	**0.002**	
Non-fatal overdose								

Characteristic	No use[a], n=451	Infrequent use, n=142			Frequent use, n=65			Overall p-value
			RRR (95% CI)	p-value		RRR (95% CI)	p-value	
No	183 (84.7%)	59 (75.6%)	1		23 (69.7%)	1		0.05
Yes	33 (15.3%)	19 (24.4%)	1.79 (0.95-3.37)	0.07	10 (30.3%)	2.41 (1.05-5.53)	**0.04**	
Borrowed used needle/syringe								
No	373 (89.2%)	122 (89.1%)	1		60 (92.3%)	1		0.72
Yes	45 (10.8%)	15 (10.9%)	1.02 (0.55-1.89)	0.95	5 (7.7%)	0.69 (0.26-1.81)	0.45	
Public injecting[c]								
No	208 (61.9%)	44 (37.6%)	1		42 (70.0%)	1		**<0.001**
Yes	128 (38.1%)	73 (62.4%)	2.70 (1.75-4.16)	**<0.001**	18 (30.0%)	0.69 (0.38-1.26)	0.23	
Hepatitis C seropositive								
No	39 (12.5%)	4 (4.0%)	1		3 (7.7%)	1		**0.03**
Yes	274 (87.5%)	95 (96.0%)	3.38 (1.18-9.71)	**0.02**	36 (92.3%)	1.71 (0.50-5.81)	0.39	
Incarceration in 12 months prior to interview								
No	326 (73.6%)	87 (64.9%)	1		30 (47.6%)	1		**0.001**
Yes	117 (26.4%)	47 (35.1%)	1.51 (0.99-2.27)	0.05	33 (52.4%)	3.06 (1.79-5.25)	**<0.001**	

Note: Boldface indicates statistical significance ($p<0.05$). Abbreviations: RRR, relative risk ratio; 95% CI, 95% confidence interval; IQR, interquartile range; OAT, opioid agonist therapy. [a]No use of the Melbourne supervised injecting facility was the reference response. [b]Relatives, friends, or housemates. [c]Public injecting was only asked to participants who indicated purchasing heroin and/or meth in the week prior to the interview.