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What is Known About the Impacts of Supervised Injection Sites on Community Safety and Wellbeing? A Systematic Review

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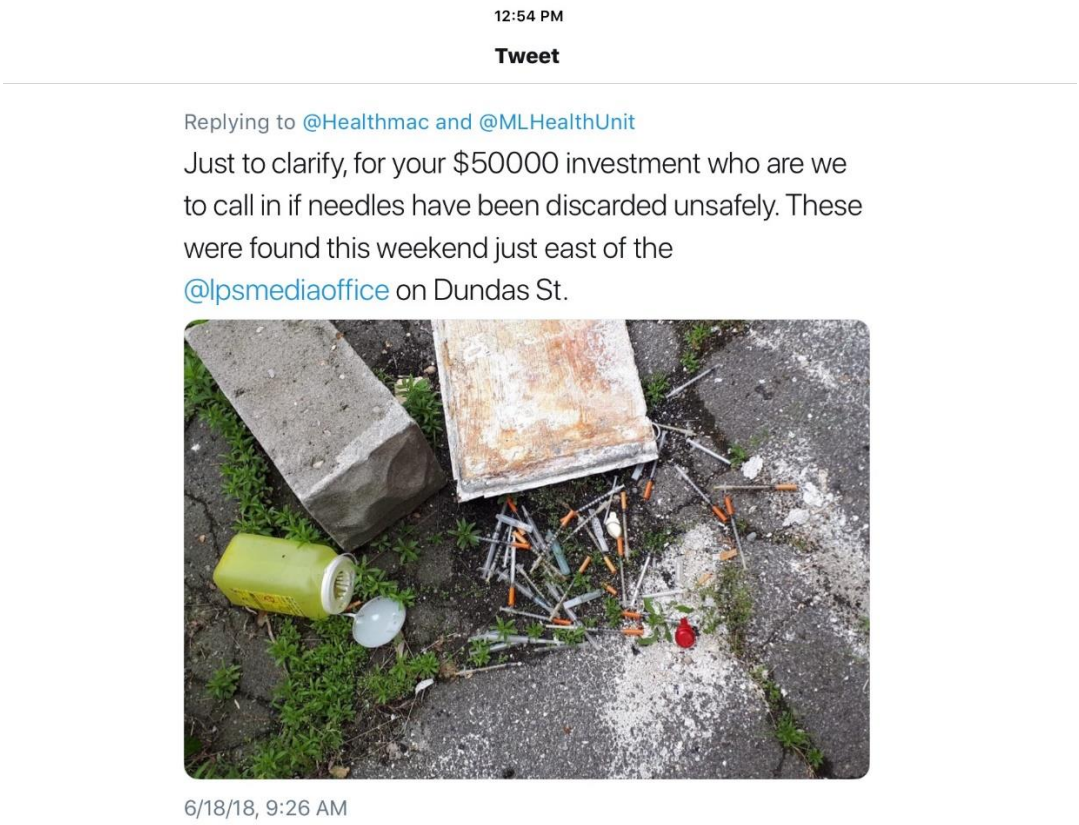


> I heard a lot of people don't want to take their kids to the parks downtown because there's a lot of needle use. I know when they did some work … where they just moved the building from the river, so they did some cleanup in the bush. They cleaned up the bush and the trees in the back and the hill and I think he picked up 900 needles, in the woods there – Business owner, London, Ontario.

> [Intravenous drug users] put them everywhere. They choose not to dispose of them. It's sad. We were dealing with a couple individuals in the summer time. Literally came upon them with needle in vein and probably less than 10 feet away was a dirty needle box and boom, just tossed it – Police officer, London, Ontario.

The quotes above are excerpted from interview data collected for a study on foot patrol conducted for the London Police Service and the London Downtown Business Improvement Association. During interviews with members of both groups on crime and disorder issues in the City's downtown core, a recurring theme identified early on were safety and visible disorder

concerns related to discarded syringes from intravenous drug use. Despite the adoption of such public health initiatives as needle exchange programs, London, like many other cities, continues to face significant public health and safety issues from intravenous drug use. In response to growing concerns over overdose fatalities, infectious disease rates and other health, the City of London began exploring the possibility of implementing its first supervised injection site[1] (SIS).

Much of the research and other literature on SISs – as well as public debate – focus on one of two themes:

1. The public health benefits of supervised to intravenous drug users (IDUs);
2. Moral, legal and other public concerns linked to creating spaces for the consumption of illicit drugs (see, for example, Watson et al. 2012).

What has received perhaps less attention is the potential (or not) for SISs to enhance community safety and well-being (CSWB). Adopting a CSWB lens, this paper provides a systematic review of the relevant research literature to answer four (n=4) important research questions:

1. What is the impact of SISs on local[2] crime?
2. What is the impact of SISs on local disorder issues?
3. What is the impact of SISs on local well-being?

To answer these questions, I conducted systematic searches of the research literature using two methods: 1. keyword queries of academic databases and; 2. snowball sampling in which the references sections of papers located through initial queries were used to identify further relevant papers. In total, thirteen (n=13) papers were identified as meeting the inclusion criteria, the results of which were then synthesized using a narrative approach to draw conclusions with respect to each of the research questions.

[1] Also known as a 'safer injection site' or a 'supervised consumption site', among other terms.
[2] By local, I mean crime occurring within a few blocks of a SIS.

Method of inquiry

Research questions

1. What is the impact of SISs on local crime?
2. What is the impact of SISs on local disorder issues?
3. What is the impact of SISs on local well-being?

Systematic review

The method selected for this study was a systematic review (SR) of the published, peer-reviewed research literature on supervised injection sites. For those unfamiliar with this technique, a SR is a method of locating, sorting and synthesizing the results of studies conducted on a particular topic area (Neyroud 2011; Johnson et al. 2015). The process begins with the creation of a set of research questions, as well as the establishment of strict inclusion and exclusion criteria, and an appropriate search strategy (Akobeng 2005; Pawson 2006). SRs can include both meta-analysis and narrative reviews. Meta-analysis is appropriate when researchers are drawing on studies of a similar research type, they can then use statistical methods to measure effect size of an intervention by pooling results of multiple studies (Hofler and Hoyer 2014). In the instant case, I chose to use a narrative approach, as there were wide variations in the methodological techniques used in the primary research selected.

Defining terms

Prior to beginning my searches, I needed to define my terms. The following are the definitions chosen.

Crime –defined as any *Criminal Code* violation.

Disorder – is defined here as including such activities as public injection drug use and loitering.

Well-being – in exploring issues in relation to community well-being, I opted to focus on 'community health'. In relation to community health, I am deviating from previous studies in two

important regards. First, my focus here is on the health of individuals who are not within the IDU population. The research literature on the benefits of SISs for IDUs is fairly well-established, as evidenced by two systematic reviews on the public health benefits for this population (Potier et al. 2014; Kennedy et al. 2017) and does not need to be re-hashed here. Second, whereas previous studies have categorized discarded syringes in public spaces as a disorder issue, I am opting to treat it as a potential health risk for the larger public. I do so mindful of public health official claims that the risk of transmission of infectious disease through needle pricks is low (Libois et al. 2005; Moore 2008). The reality is the risk of infection is not non-existent and being wounded by a needle can be a health risk for some.

Search strategy

Following standard SR practice, I set the inclusion criteria for this SR as follows:

1. Any peer-reviewed study conducted on a SIS that included analysis of data on crime effects;
2. Any peer-reviewed study conducted on a SIS that included analysis of data on disorder;
3. Any peer-reviewed study conducted on a SIS that included analysis of data on local community health effects (meaning: individuals who are not IDUs);

I then chose to limit the scope of the search to peer-reviewed papers that present the results of a primary evaluation of a relevant aspect of a SIS – that is, a paper that explored the relationships of a SIS to crime, disorder and community health issues (beyond the IDU). The present paper draws on peer-reviewed papers only, for one simple reason: these are typically of higher quality than those otherwise found in the public domain. Further, given the nature of much of the research in the area, I note that these criteria were not mutually exclusive, and that several studies contained data on crime, disorder and health effects. Lastly, what were excluded were opinion papers, previous attempts at synthesizing the research literature, foreign language publications and ‘grey

literature' – that is, any research or papers in the public domain that have not been subjected to peer review.

Prior to beginning, decisions were also made as to search strategy. As I have opted to use only peer-reviewed, published research papers, I chose to limit my searches to academic databases. The University of Western Ontario's search engine allows for simultaneous searching of hundreds of journals and databases, including PubMed, Ebscohost, Sage Journals and JStor. To locate appropriate studies, I used the following search terms:

Search terms	**Initial results**
"supervised injection site"	217
"supervised injection facility"	461
"safer injection site"	29
"drug consumption site"	16
"drug consumption facility"	113
"consumption room"	422
"fixing room"	30

Duplicate entries were immediately discarded, then the abstract for each identified result was read to determine if the paper met the inclusion criteria. In some cases, the paper itself was read to ensure studies were not summarily excluded.

As a precautionary measure, articles selected through the database searches were also read to determine if any work was cited in a paper that did not turn up in the online library searches. One additional paper was found through this method.

Once the initial results were evaluated according to the inclusion criteria, the overall dataset comprised a sample of thirteen (n=13) papers. In the next section, I will provide both the overall results, as well as addressing the specific research questions.

Results

Overall results

Thirteen (n=13) studies[3] met the overall selection criteria. This dataset studies examining crime, disorder and well-being effects of SISs. Of the latter, five (n=5) presented data collected through ongoing study of Vancouver's INSITE, three (n=3) from Germany, two (n=2) were from Australia, one (n=1) utilized data from Denmark, one (n=1) was from the United Kingdome and another one (n=1) from the Netherlands.

Table 1: Papers selected for inclusion[4]

Author(s)/year	Population/ Sample size	Study purpose	Main findings
Freeman et al. 2005	Merchant/ Resident interviews. N=19; otherwise not applicable[5]	To model the effects of an Australian SIS on acquisitive crime and loitering by drug users and dealers.	There was no evidence that the SIS led to either an increase or decrease in theft or robbery incidents. There was also no evidence that the SIS led to an increase in 'drug-related' loitering, although there was a small increase in 'total' loitering. Trends in both 'drug-related' and 'total' loitering at the SIS steadily declined to baseline levels, or below, after it opened. Interviewees noted an increase in loitering but this was not attributed to an influx of new users and dealers to the area.
Kinnard et al. 2014	IDUs. N=41	To evaluate whether use of SIS services is associated with changes in injecting behavior and syringe disposal practices among IDUs.	Approximately 75% of participants reported reductions in injection risk behaviors since the opening of the SIS. There were fewer public injections (56.1%), and 58.5% reported changing their syringe

[3] Previous systematic reviews included a greater number of studies (75 studies were examined by Potier et al. 2014). The discrepancy in dataset size is largely due to the nature of the questions asked here, which focus on a narrower range of concerns that is typically found addressed within SIS studies.

[4] Data sources are specified in the following sections.

[5] Interviews were triangulated with time series analyses (field observations) and police data.

			disposal behaviours. Of the latter, twenty-three reported changing from not always disposing safely to always disposing safely.
Miller et al. 2010	Community stakeholders (residents/ Merchants/ Area warden) N=40	Examines the impact on the local community of a SIS in the U.K.	Interviewee concerns that the SIS would result in increased numbers of drug users coming to the area were not borne out. At follow-up, key informants reported no such effect on the local community. Police figures show no significant changes in monthly or average annual crime levels in the local area.
Milloy et al. 2009	IDUs. N=902	To investigate the association between SIS use and recent incarceration among IDU.	The rate of incarceration remained stable throughout follow-up with between one-quarter and one-third reported incarceration in the previous 6 months at each study visit. Statistical analysis showed that frequent SIs use was not associated with recent incarceration, therefore the study showed now evidence to support the view that SIS use increases involvement in drug-related crime.
Petrar et al. 2006	IDUs N=1082	To explore IDU experiences and opinions about INSITE.	As a result of SIS use, 809 participants(75%) reported changes in injecting behaviour. This included 71% indicating less public injecting and 56% reporting less unsafe syringe disposal.
Salmon et al. 2007	Residents and area businesses. Res N=515, 540 and 316 Bus N=269, 207 and 210	To investigate if community perceptions of a local SIS have changed over Time (from baseline to 18 months and then at 4 ½ years).	An overall significant decrease was observed in the number of residents and businesses reporting public injecting and public discarded needles/syringes and other litter. There was no change in the number of residents offered drugs. Businesses that had witnessed public injecting or discarded needles and syringes in the last month were less likely to report either if located over 500m from the SIS. Those businesses operating for over 5 years

			were more likely to have seen publicly discarded needles and syringes than those who had opened within the last year.
Scherbaum et al. 2010	IDUs N=129	To explore whether SIS use was associated with reductions in at-risk behaviours and referrals to health care services.	After 3 months of SIS there was no change in at-risk behaviours (including public injecting). However, 37% of clients were referred to methadone treatment.
Stoever 2002	IDUs N=unknown as author counted injection events not clients	To describe the effects of both SIS in general, and the results of a SIS evaluation in Hanover, Germany.	IDUs reported that risk behaviours were reduced and the researchers observed no SIS impacts on drug-related loitering.
Stoltz et al. 2007	IDUs N=760	To explore whether SIS use promoted changes in injecting practices among IDUs.	More consistent use of SIS services was found to lead to greater positive changes in injecting behaviours. This includes cleaner injection practices, less rushed injections, safer syringe disposal and less public injecting.
Van der Poel et al. 2003	IDUs N=67	To evaluate the operation of four of Rotterdam's six SIS.	Access to SIS resulted in less frequent public injecting and other safer behaviours. Two 'weak points' of SIS usage reported by IDUs are in relation to personal health and public nuisance reduction.
Wood et al. 2004	n/a due to methods selected	To investigate whether the implementation of a SIS has had any effects on public order.	The opening of the SIS was associated with improvements in several measures of public order, including reduced public injection drug use and public syringe disposal.
Wood et al. 2006	n/a due to methods selected	Evaluate SIS effects after 3 years of operation on a number of variables, including client characteristics, public injection behaviours, publicly discarded syringes, HIV risk behaviour, use of addiction treatment services and other community resources,	INSITE is associated with an array of community and public health benefits without evidence of adverse impacts.

		and drug-related crime rates.	
Zurhold et al. 2003	IDUs N=616 Residents/ Area Merchants N=	To evaluate the effects of a SIS in Hamburg.	The SIS reached its target group of IDUs and produced positive changes in health-related behaviours, including public injection. In addition, the findings indicate that the Hamburg SIS played an important role in the reduction of public disturbances in the vicinity of open drug scenes.

From the beginning it was my intention to include a rating of the quality of each study as a means of guiding readers' assessments of the evidence presented. Unfortunately, this could not be done for several reasons. First, the studies included were diverse in their research methods and included qualitative interviews and surveys. It is generally accepted that there are, at present, no standardized methods for assessing the quality of such types of research (Potier et al. 2014). Before admitting defeat, I did attempt to see whether a modified version of either the Maryland Scientific Methods Scale (MSMS) or the EMMIE rating system could be employed. The former is a system for evaluating the robustness of research evidence based on the belief that treatment group comparisons (preferably in the form of randomized controlled trials) are the preferred methodology. None of the included studies are comparative, so they would all rank as a 1, thus rendering any evaluation of this type meaningless. The EMMIE system is a significantly more rigorous means of permitting researchers to assess the reported effects of a study, the quality of its methodology and a host of other considerations (Johnson et al. 2015). While EMMIE may work well for a small number of studies of a similar type, it's incredibly cumbersome when dealing with a heterogeneous sample (which is what I had). So, in short, I have opted to not attempt any assessments of the rigor of each study, leaving that to the reader to determine for him or herself.

A further point: Canadian critics have questioned the extent to which the SIS evidence base relies on studies from medical researchers associated with Vancouver's INSITE program (Taverner 2012). To counter that charge, I have tried, where possible, to also draw on studies from other countries, as well as on work by researchers in Canada who are not associated with the ongoing INSITE study. It is further worth noting there are some valid reasons as to why INSITE research currently makes up the bulk of research in the area. First, it has long been the only legally sanctioned SIS in North America and research has been a central component of INSITE's work. Second, I drew exclusively on English-language journals and so foreign language publications were excluded, thus limiting the opportunity to explore data from Europe.

Q1. What is the impact of SISs on local crime?

Table 2: Papers that explored crime deterrent and/or criminogenic effects of SISs

Crime type	Author(s)/year	Data source	Country	Increase/ Decrease
Robbery	Freeman et al. 2005	Police data	Australia	Null (no significant relationship)
Theft	Freeman et al. 2005	Police data	Australia	Null (no significant relationship)
Drug dealing	Salmon et al. 2007	Area resident survey	Australia	Null (no significant relationship)
Drug possession/ Trafficking	Freeman et al. 2005	Police data	Australia	Null (no significant increase)
General crime	Milloy et al. 2009	Questionnaire/ IDU incarceration rates	Canada	Null (no significant relationship)
General crime	Miller et al. 2010	Police data/interviews	U.K.	No significant crime fluctuations post-SIS implementation

As can be seen in Table 2 above, four (n=4) studies addressed the issue of potential criminogenic effects of SISs (what Miller et al. 2010 term a 'honeypot effect'), a frequent concern

of local residents and businesses. None of these studies showed significant changes in crime patterns (neither an increase nor a decrease). Of these, the study by Miller et al. is perhaps the most instructive as it looked at both acquisitive, drug-related and violent crimes. Using Metropolitan Police data, the researchers were able to compare overall crime levels at both baseline and post-implementation (the SIS opened in October 2005). See figure 1 below.

Figure 1.

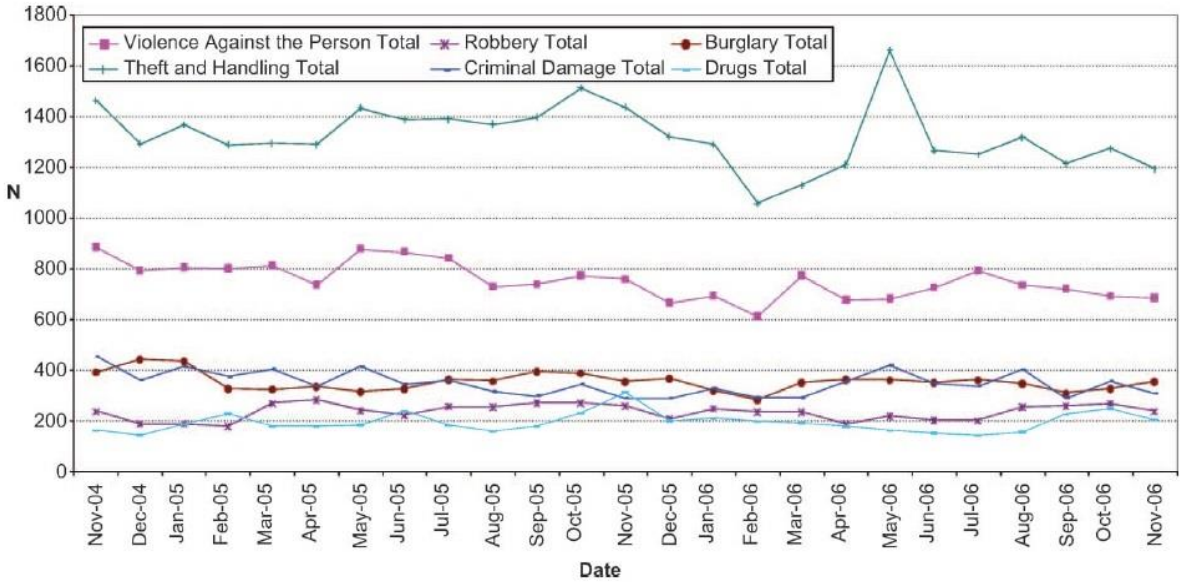


Figure 1. Metropolitan Police crime statistics – Borough of Southwark November 2004–November 2006 (per 1000 population).

Source: Miller et al. 2010.

Q2. What is the impact of SISs on local disorder issues?

Table 3: Papers that explored disorder deterrent and/or amplification effects of SISs

Disorder type	Author(s)/year	Data source	Country	Increase/ Decrease
Drug-related loitering	Freeman et al. 2005	Loitering counts (b) time series analysis of trends in the proportion of Sydney's drug	Australia	Loitering counts show small decrease in loitering in front of building post-SIS implementation; number of loiterers in back of building too

		offences recorded (c) interviews.		small before/after implementation. Interviewees felt loitering had gone up.
Drug-related loitering	Stoever 2002	Survey and observational data	Germany	No "crowds" (ie. Open air drug scene) were observed in front of the SIS.
Drug-related loitering	Van der Poel	IDU survey	Netherlands	Wait times at the SIS due to lack of sufficient facilities means causes public loitering
Injection related litter	Wood et al. 2004	Field survey	Canada	Statistically significant decrease
Injection related litter	Wood et al. 2006	Field survey	Canada	Statistically significant decrease
Public injecting	Salmon et al. 2007	Area resident survey	Australia	Statistically significant decrease
Public injecting	Scherbaum et al. 2010	3 month longitudinal study of 129 participants	Germany	No decrease at 3 months)
Public injecting	Zurhold et al. 2003	Questionnaire and interviews	Germany	30% of IDUs surveyed reported a decrease; interviews support the view that SIS reduce public injecting
Public injecting	Wood et al. 2004	Field survey	Canada	Decline in public injecting
Public injecting	Wood et al. 2006	Field survey	Canada	Decline in public injecting
Public injecting	Petrar et al. 2006	IDU survey	Canada	71% reported less public injecting
Public injecting	Stoltz et al. 2007	IDU survey	Canada	Less reported public injecting
Public injecting	Kinnard et al. 2014	IDU survey	Denmark	Less reported public injecting
Public injecting	Van der Poel et al. 2003	IDU survey	Netherlands	Although public drug use continues, 83% of participants state they use in public less frequently since the SIS was opened.

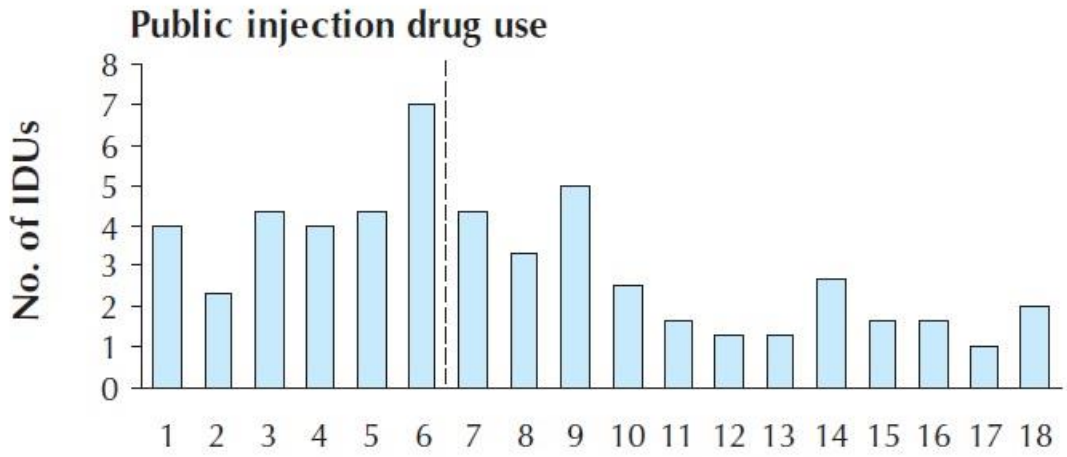
Table 3 above presents the results of eleven (n=11) studies that examined the real or potential effects of a SIS on three aspects of area disorder typically associated with an open-air drug scene: drug-related loitering, injection-related litter and public injecting. In relation to drug-related loitering, the results are mixed. Two studies showed a decline (one significant, one less so). A third found loitering to be an issue due to wait times, suggesting that an ability to service clients quickly and/or on-demand may be a significant factor in reducing crowd size.

Another common form of disorder experienced by communities with open-air drug scenes is litter related to injection or other drug use. This litter frequently includes syringe caps and wrappers, as well as other discarded materials. To illustrate the nature of this type of debris and its accumulation, in one cemetery in Scotland, during field research the author observed literally hundreds of orange syringe caps littered over individual graves. Two studies – both by research teams looking at data collected at the INSITE facility in Vancouver – found statistically significant decreases in injection-related litter after the opening of the SIS there. These findings were achieved through a field survey that compared baseline (six weeks prior to opening) to post-implementation (twelve weeks after) field counts.

Public injection is another frequent concern of area residents and businesses. Not only is public injection experienced by many people as an unpleasant act to witness, but, as noted above, it frequently goes along with litter and publicly discarded needles. Nine (n=9) different studies looked at reported rates of public injection among IDUs following the implementation of a SIS. Eight (n=8) of these studies found that the operation of a SIS reduced public injecting behaviours. The findings across these studies were variable, suggesting the need for exploring further what specific factors lead to decreases in public injecting. It is also worth noting that the one study that found no decrease in public injecting suffers from a limitation that may have impacted the results:

the overall sample size is small for a study of this nature. The estimated population of IDUs in Essen is approximately 3000-3500 (Scherbaum 2010). The original n in this study was 124, but dropped to only 43 at the 2 month follow-up (ibid.). Therefore, it would be somewhat surprising to see significant improvements overall. By way of comparison, the Zurhold study relied on a n of 616 IDUs, the Stoltz study on a n of 760, and Petrar on a n of 1082 participants.

Figure 2: Public Injection Drug Use pre- and post-SIS implementation from one study



Source: Wood et al. 2004

Q3. What is the impact of SISs on local health and well-being?

Table 4: Papers that explored impacts on local health and well-being

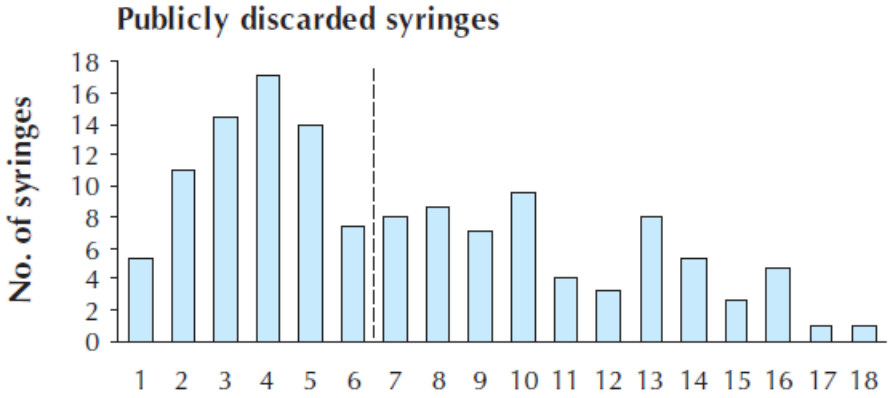
Community well-being issue	Author(s)/year	Data source	Country	Increase/ Decrease
Unsafe disposal of syringes	Salmon et al. 2007	Area resident survey	Australia	Statistically significant decrease
Unsafe disposal of syringes	Petrar et al. 2006	IDU survey	Canada	56% reported less unsafe discarding of syringes
Unsafe disposal of syringes	Kinnard et al. 2014	IDU survey	Denmark	SIS users reported being more likely to engage in safe disposal practices

Unsafe disposal of syringes	Stoltz et al. 2007	IDU survey	Canada	SIS users reported being more likely to engage in safe disposal practices

Public health officials have repeatedly advised the public that discarded needles and syringes are not a significant health and safety threat. In the recent words of one health official, they will not "jump out and bite you" (Coulter 2018). That said, it is also the case that the risk of transmission of infectious disease from a needle prick is not zero and that being accidentally pricked necessarily entails months of precautionary testing (as was recently the situation when a five-year-old boy in St. Thomas, Ontario picked up a discarded needle (Broadley 2018)). Further, to deal with publicly discarded syringes, public health officials advocate for the public learning how to *safely* pick up and dispose of this form of IDU waste, or call local authorities for their removal, thus imposing an additional burden on area residents and merchants, who already need to be vigilant about needles and syringes in their community (Coulter 2018).

Keeping the above in mind, I identified four (n=4) studies that specifically examined SIS effects on the public discarding of syringes. Each of these studies found that SIS clients were more likely to engage in safer disposal practices (although not explicitly stated, likely by discarding used syringes onsite). As is the case with public injecting, SISs are not a perfect solution to this issue, as some IDUs continue to inject publicly and discard their syringes outside. However, overall improvements in this area were observed (see, for example, figure 3 below).

Figure 3: Publicly discarded syringe rates pre- and post-SIS



Source: Wood et al. 2004

Conclusions

In summary, analysis of the relevant research literature on SISs and their effects on public crime, disorder and community health issues (discarded syringes) shows that the preponderance of evidence thus far is tilted towards supporting the view of these sites as producing favourable outcomes for not only IDUs, but also for potentially enhancing the well-being of the local community. *Contra* previous literature reviews – some of which were clearly not conducted systematically (see Taverner 2012) – I am strictly advancing an evidence-based argument. Aside from ideological or moral arguments, which should have little place in an evidence-informed discussion, the only limitation of this study, and of the evidence base more generally, is that it is not nearly as fulsome as one would wish.

I recognize it is somewhat axiomatic for researchers to conclude studies by calling for more research. However, with increased calls for SISs based on rising fatality rates and demonstrable needs for health-related services among injection drug users, it is imperative that we better understand any and all positive and negative aspects of siting SISs within local communities. Knowing these things will better prepare service providers, police and local communities for

ensuring the needs of SIS clients are met in ways that minimize the potential for NIMBYism, local conflict, stigma and other problems that may occur.

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