Investigating the spatial association between supervised consumption services and homicide rates in Toronto, Canada, 2010–2023: an ecological analysis

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Summary

Background Supervised consumption services (SCS) are effective at preventing overdose mortality. However, their effect on public safety remains contested. We investigated homicide rates in areas near SCS in Toronto.

Methods We classified coroner-reported fatal shootings and stabbings (January 1st, 2010 to September 30th 2023) by geographic zone: within 500 m ('near'), between 500 m and 3 km ('far'), and beyond 3 km of an SCS ('out'). We then used Poisson regression to calculate the rate ratio (RR) across zones 18, 36, 48, and 60 months pre vs. post SCS implementation. Finally, we compared spatial homicide incidence prior to and after the date of the implementation of each SCS using interrupted time series (ITS).

Findings Overall, 956 homicides occurred, and 590 (62%) were fatal shootings and stabbings. There was no meaningful change in the rate of fatal shootings and stabbings within 3 kms of SCS (near and far zones) after their implementation. However, between 48 and 60 months pos-implementation, we detected an increase in out zones. In an ITS analysis, we observed a reduction in the monthly incidence in near zones and an increase in out zones.

Interpretation SCS implementation was not associated with increased homicide rates; instead, we observed a reduction in monthly incidence near SCS. These results may inform drug market activity responses that optimize community health and safety.

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Keywords: Supervised consumption services; Homicide; Public safety; Toronto; Spatial analysis; Interrupted time series; Harm reduction

Introduction

Supervised consumption services (SCS) provide a supervised environment for people to use and/or inject drugs, which evidence consistently demonstrates can reduce the risk of fatal drug overdoses and infectious disease transmission.[1,2] Since the initial opening of two SCS in August 2017, the City of Toronto, Canada, has witnessed an increase in the number of sites, with nine community SCS in operation as of September 2024 (see Figs. 1 and 2).[3]

On July 7th 2023, a fatal shooting within 100 m of an SCS amplified concerns regarding the potential public safety impact of these facilities.[4] This prompted a provincial SCS audit across Ontario, which focused on the

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Research in context

Evidence before this study

Scientific evidence on the association between supervised consumption services and public order exists, but no studies have yet explored their relationship with violent crime such as homicide.

We searched PubMed and Google Scholar to identify any studies, published in English from database inception to September 25th, 2024, that explored potential associations between SCS on homicide, using the search terms ("supervised consumption services" OR "supervised injection services" OR "supervised injection services" OR "supervised injection sites" OR "overdose prevention sites") AND ("homicide" OR "shooting" OR "stabbing" OR "killing" OR "homicide rate") AND ("population" OR "neighbourhood" OR "spatial" OR "spillover") AND ("spatial analysis" OR "spatial" OR "population effects"). We placed no restrictions on the country where studies were conducted. To be included, studies had to consider associations between spatial or population/neighborhood-level homicide and SCS implementation. Studies with other outcomes, such as drug-related disorder, non-fatal violent crimes, or litter potentially associated with SCS implementation, were excluded. We also searched the references cited in relevant studies. We found one study that investigated all-cause mortality, which included homicide, among people who inject drugs in Vancouver, Canada, and which found that mortality was subsequently decreased among those that previously reported at least weekly use of a SCS. However, we could not find any studies that specifically investigated the association between homicide and SCS, nor any estimating the association of SCS with population-level homicide trends.

Added value of this study

This study, which used coroner's data from Toronto, ON, Canada, involved a spatial analysis of the association between SCS and homicides between 2010 and 2023; most SCS were implemented beginning in 2018. Overall, we found no evidence that homicide rates increased in areas near SCS. Instead, we found a minimal decrease in the incidence of homicides near SCS and a minimal increase in homicides in areas more than 3 km away from these sites.

Implications of all the available evidence

To our knowledge, these are the first findings to explore the potential influence of SCS on population-level fatal violent crime, and run counter to claims made by policymakers in Ontario seeking to close SCS. While these findings may be helpful in optimizing public health and safety in the context of overdose prevention, more evidence from other settings with SCS is needed to assess the generalizability of our results. However, based on the results reported herein, it appears unlikely that SCS implementation will increase homicides.

potential relationship between SCS operations and drug market activity, including homicide.[5] On August 20th, 2024, the Government of Ontario announced the closures of 10 of the 17 SCS operating in the province, including 5 SCS in Toronto, with the provincial Minister of Health suggesting that the closures were needed because the sites led to increasing shootings, stabbings, and homicides in surrounding areas.[6] On November

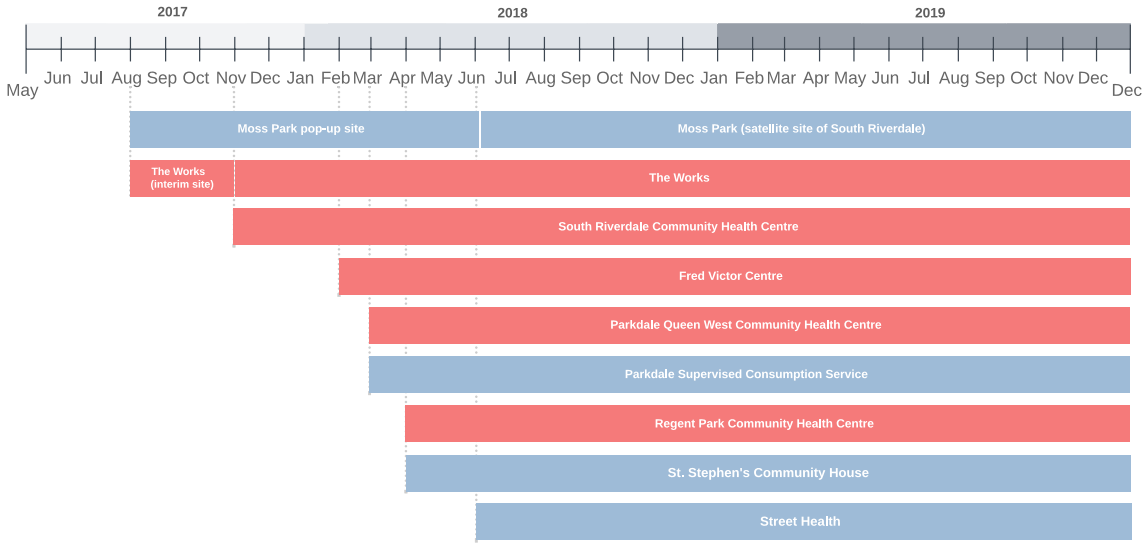

Fig. 1: Timeline of integrated supervised consumption site (red) and overdose prevention site (blue) implementation in Toronto.

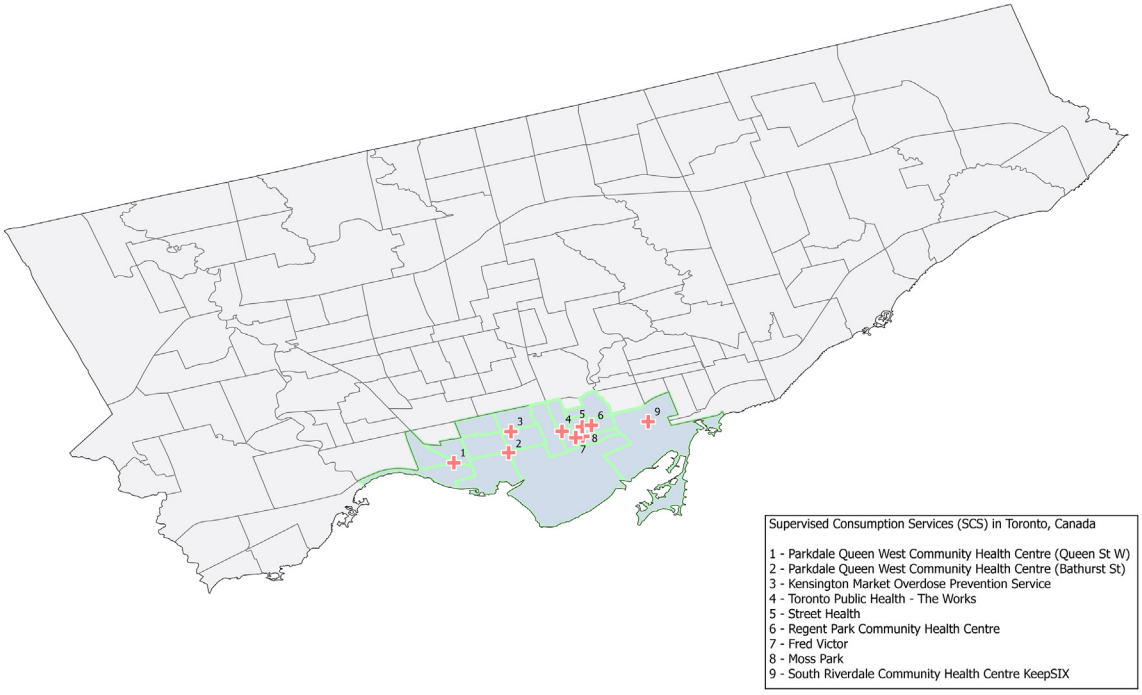

Fig. 2: Integrated supervised consumption services (red) and overdose prevention sites (blue) in Toronto, Canada. Shaded areas indicate neighbourhoods within 500 m of a site.

18th, legislation was introduced in the provincial legislature to codify this ban.[7] However, no evidence was provided to support this legislative ban, nor has existing scientific evidence explored an association between homicide and the presence of supervised consumption services.

Broadly, the existing scientific evidence on SCS has demonstrated a lack of association or reductions in indicators of criminal activity plausibly related to drug market after their implementation. For example, data from Vancouver suggest that public injecting and vehicle break-ins reduced after SCS implementation, while SCS use among unstably housed people in Toronto was associated with a 50% lower prevalence of public injecting.[8–10] Furthermore, the area in which an unsanctioned SCS in the United States was implemented subsequently experienced a significantly greater decline in major crime indicators, including assault, burglary, larceny theft, and robbery, compared to a control area without SCS.[11] Finally, two studies evaluating the association between crime and two SCS in New York found no significant increases in violent crimes recorded by police or emergency services in areas where these services were located.[12,13]

Ultimately, this evidence is likely less relevant to the government of Ontario's policy decision to ban SCS compared with ongoing perceptions by community members that SCS negatively impact public safety.[14] There remains, however, a need to optimize drug policy approaches amidst North America's intersecting drug toxicity and housing crises, which have led to unprecedented levels of mortality and housing precarity. In that context, while SCS have been shown to prevent overdose mortality[15] and public injecting,[16] data are needed to confirm any potential negative spillover effects on public safety in Toronto to respond to the needs of community members and policymakers that perceive these services as compromising public safety.[17,18]

We therefore investigated the spatial association between the location of SCS and homicides within the City of Toronto. Specifically, we sought to determine whether there was any change in the monthly rate of homicides potentially related to drug market activity in areas proximal to SCS after their implementation.

Methods

We used the REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) guidelines in designing this study.[19] We obtained all homicide files from the Chief Coroner's Office of Ontario for events that occurred in Toronto between January 2010 and September 2023. We initially extracted homicides by shooting or stabbing. This was done to reduce potential misclassification of other fatalities not likely related to drug market activity (e.g., those caused by intimate partner violence). First, we performed a singular spectrum analysis to identify the overall trend

in fatal shootings and stabbings across the entire study period[20] by removing random noise and oscillation related to seasonality. To analyze the spatial distribution of fatal shootings and stabbings relative to SCS location, we expressed the outcome as a crude homicide incidence rate per 100 000 people, which we calculated by extracting population size data for Toronto from the 2011, 2016, and 2021 Canadian census.[21] For other years, population estimates were interpolated using a spline model. We then obtained the physical addresses of SCS from the City of Toronto's service directory and determined the geographical proximity of homicides to SCS using three mutually exclusive zones: 1) "near zone", defined as 0–500 m from an SCS; 2) "far zone", defined as 500 m to 3 km from an SCS; and 3) "out zone", defined as areas beyond 3 km of an SCS, consistent with previous research on the spatial impacts of SCS in Toronto.[15] On the date of each SCS implementation, we reclassified previous zones if they overlapped with the boundaries of the newly implemented SCS to avoid any potential spatial misclassification.

We included nine SCS in the model that were opened at six distinct time points (August 2017, November 2017, February 2018, March 2018, April 2018, and June 2018). We then calculated the rate ratio (RR) of deaths in each zone 18 and 36 months before and after the implementation of each SCS using a Poisson regression model. We also undertook a sensitivity analysis by varying the observation period to 48 and 60 months before and after SCS implementation. Next, we calculated the independent effect of SCS implementation on the monthly incidence of fatal shootings and stabbings across the entire study period for each distinct zone. This was done via interrupted time series using autoregressive models to address differing implementation dates for each of the sites. This approach accounts for autocorrelation of the errors as well as heteroscedasticity in the distribution of outcomes.[22] In an effort to further address potential misclassification, we undertook two sensitivity analyses. First, we expanded our analysis to include all homicides in Toronto. Second, we restricted to fatal shootings and stabbings that occurred outdoors (thereby removing homicides potentially related to intimate partner violence rather than drug market disputes). We elected not to undertake tests of significance given that we deemed the dataset of homicides used to undertake these analyses as essentially complete, and sampling variability was therefore not a meaningful risk to our analyses or interpretation. All analyses were undertaken using SAS Version 9.4 and R Version 4.3. DW and YN had full access to all data. This study was approved by the Unity Health Toronto Research Ethics Board.

DW contributed to conceptualization, analytic guidance, manuscript writing, and study leadership, data access and verification; HS contributed to analysis and manuscript drafting; YN contributed to analysis, data access and verification; IR contributed to data curation; JE contributed to study leadership, manuscript revision, supervision; AS contributed to editing, revision, and interpretation; AOB contributed to writing editing, revision, and interpretation; TK

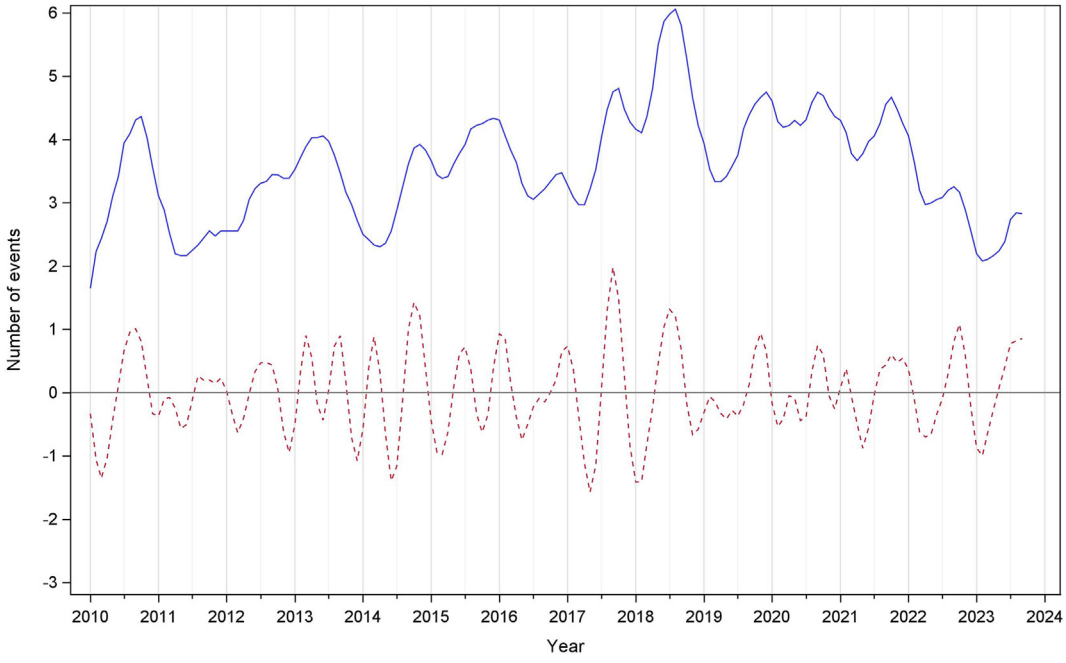

Fig. 3: Singular spectrum analysis of fatal shootings and stabbings in Toronto, Canada, January 2010–September 2023.

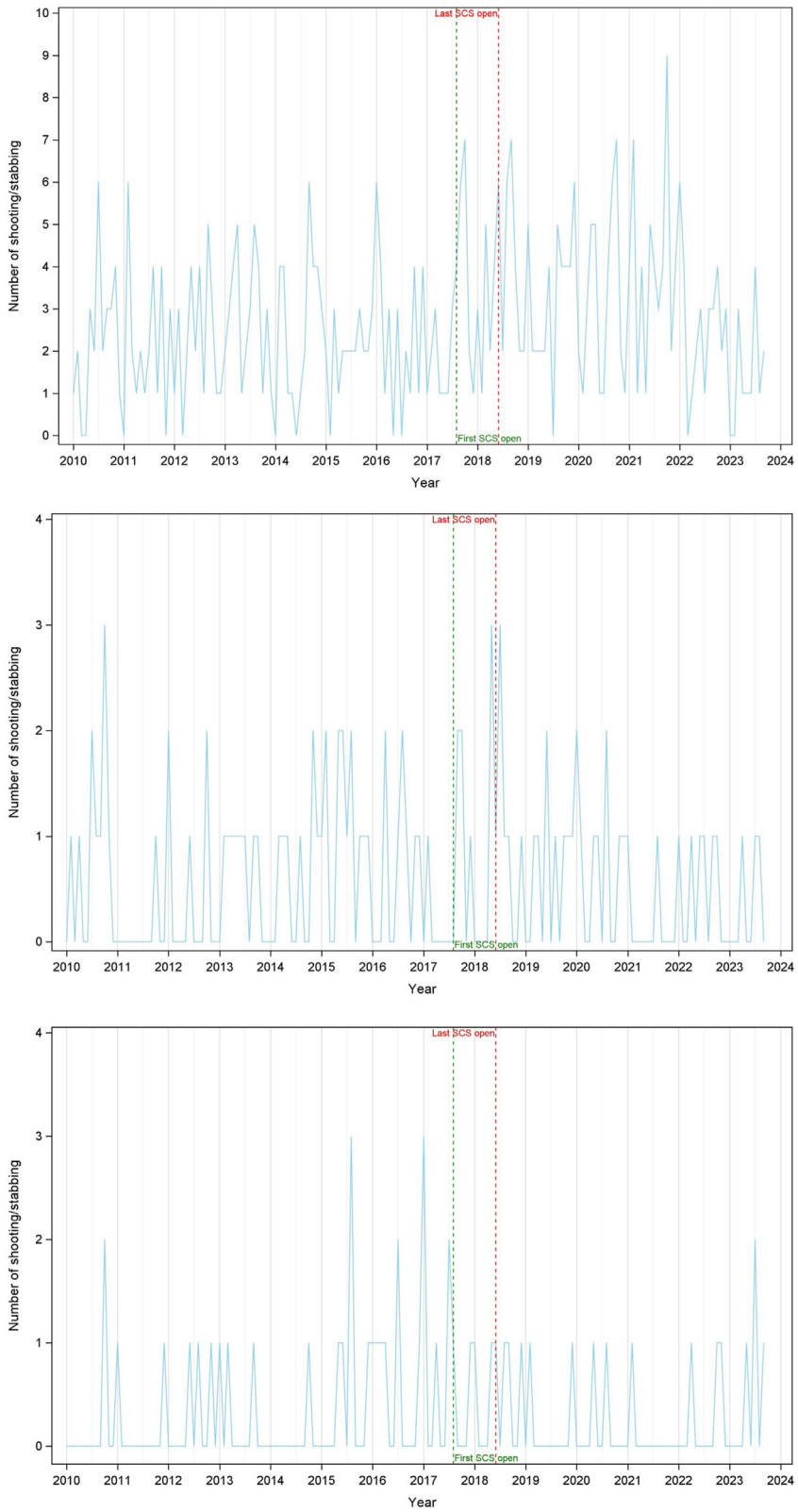

Fig. 4: Fatal shootings and stabbings within 500 m, between 500 m and 3 km, and more than 3 km from where supervised consumption services were implemented in Toronto, Canada, January 2010–September 2023.

contributed to editing, revision, and interpretation; MK contributed to study leadership, analytic guidance, editing, revision, and interpretation. This research was funded by the Canadian Institutes of Health Research (PJT-153153; PCS-190985) and the New Frontiers in Research Fund (NFRFR-2022-00077). DW is supported by the St. Michael's Hospital Foundation via the St Michael's Hospital/University of Toronto Chair in Mental Health and Substance Use Disorders. Funders had no role in study design, data collection, data analysis, reporting, or the decision to publish this study.

Results

Among 956 homicides committed in the City of Toronto between January 1st, 2010 and September 30th, 2023, 590 (62%) were fatal shootings and fatal stabbings. The annual incident rate of fatal shootings and stabbings fluctuated between 1.11 per 100,000 population (2011) and 2.1818 per 100,000 population (2018). Fig. 3 presents results of a singular spectrum analysis, demonstrating the overall fatal shooting and stabling trend line and patterns of seasonality. Fig. 4 presents all fatal shootings and stabbings stratified by the three zones (<500 m, between 500 m and 3 km, >3 km from an SCS) across the entire study period.

The results of a Poisson regression comparing the rate of fatal shootings and stabbings in the 18, 36, 48, and 60 months before and after SCS implementation in Toronto are presented in Table 1. As can be seen, we detected no meaningful change in the incident rate of fatal shootings and stabbings in areas within 500 m (near zone) and between 500 m and 3 km (far zone) of SCS after they were implemented. However, we detected a meaningful increase in the rate of fatal shootings and stabbings in areas more than three kilometers away (out zone) from SCS in the 48- and 60-month periods after their implementation compared to the periods before.

18 months before and after SCS implementation by distance	
Effect	**Rate Ratio (RR)**
Near (<500 m): after vs. before	0.5000
Far (500 m–3 km): after vs. before	1.8889
Out (>3 km): after vs. before	1.3191
36 months before and after SCS implementation by distance	
Effect	**Rate Ratio (RR)**
Near (<500 m): after vs. before	0.4050
Far (500 m–3 km): after vs. before	1.1976
Out (>3 km): after vs. before	1.3574
48 months before and after SCS implementation by distance	
Effect	**Rate Ratio (RR)**
Near (<500 m): after vs. before	0.4093
Far (500 m–3 km): after vs. before	1.0551
Out (>3 km): after vs. before	1.4347
60 months before and after SCS implementation by distance	
Effect	**Rate Ratio (RR)**
Near (<500 m): after vs. before	0.4660
Far (500 m–3 km): after vs. before	1.0143
Out (>3 km): after vs. before	1.3196

Table 1: **Rate ratio of fatal shootings and stabbings in areas proximal to supervised consumption services (SCS) prior to and after their implementation in Toronto, Canada, 2010–2023.**

Distance	Parameter	Estimate
Near (<500 m)	Intercept	0.8436
	Month	0.0083
	Level Change Post SCS	–0.5227
Far (500 m–3 km)	Intercept	0.1391
	Month	0.0003
	Level Change Post SCS	0.0958
Out (>3 km)	Intercept	0.1267
	Month	0.0004
	Level Change Post SCS	0.0618

Table 2: **Interrupted time series analysis of the effect of supervised consumption service implementation on shooting/stabbing rates by distance in Toronto, Canada, 2010–2023.**

The results of an ITS analysis of the effect of SCS implementation on the monthly incidence of fatal shootings and stabbings across the entire study period are presented in Table 2 and Fig. 5. As can be seen, the period after SCS implementation experienced a minimal decrease in the monthly incidence of fatal shootings and stabbings in near zones (Level Change Post-SCS Implementation = –0.52), no meaningful difference in far zones, and a minimal increase in out zones (Level Change Post-SCS Implementation = 0.06) compared to the period before SCS were implemented.

In a sensitivity analysis that generated rate ratios of all homicides across zones (i.e., not only shootings and stabbings), results were entirely consistent with the findings from the main Poisson regression analysis. A sensitivity analysis restricted only to outdoor fatal shootings and stabbings found no meaningful differences in rate ratios across all three zones.

Finally, an ITS analysis of only outdoor fatal shootings and stabbings yielded a minimal decrease in near zones, a minimal increase in far zones, and no meaningful change in out zones after SCS were implemented.

Discussion

Over a 13-year period in Toronto, we did not detect an increase in fatal shootings and stabbings in areas close to SCS. Instead, we found that the monthly incidence of these events decreased near SCS and that there was a minimal increase in fatal shootings and stabbings in areas farther away. These results can inform an ongoing review of SCS in the province of Ontario as well as

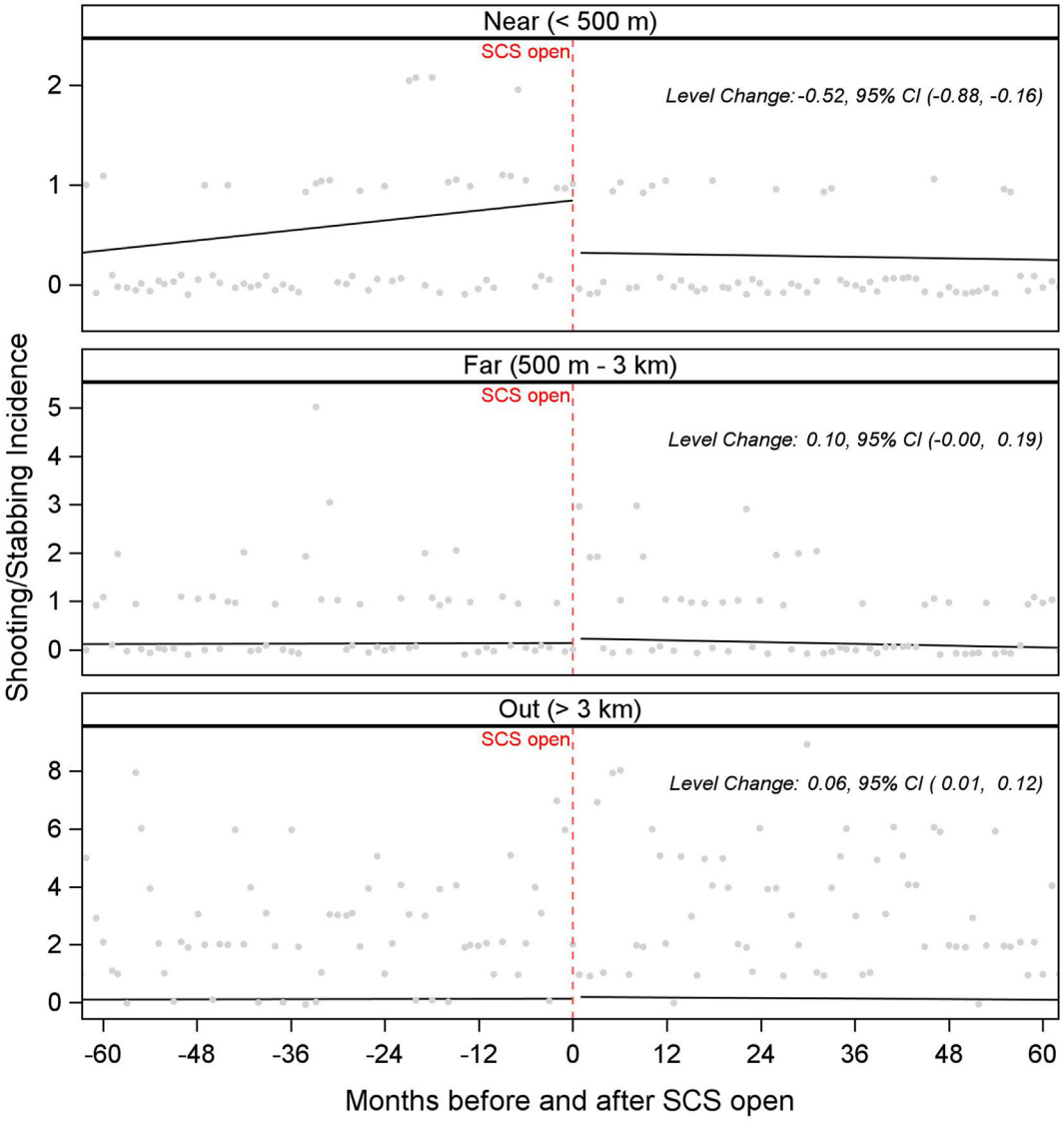

Fig. 5: Interrupted time series of fatal shootings and stabbings by distance from supervised consumption services in Toronto, Canada, January 2010–September 2023.

efforts to improve community health and safety in settings impacted by overdose.[17] These findings add to a growing body of evidence that has, on the whole, found no association between SCS implementation and increased crime rates.[2,11,13,23–25] The study presented herein extends this evidence as it is the first, to our knowledge, to investigate a potential association between SCS implementation and homicides.

SCS in Toronto have been implemented in settings where public injection and overdose mortality occurred at relatively higher rates compared to other parts of the city.[15,26] While these may be plausibly linked to some drug market activity (i.e., visible drug selling is likely to occur in settings where people frequently use opioids and other drugs in public), our findings do not support the contention that the implementation of SCS in settings where drug market activity is present is associated with homicide. Indeed, no increases in homicides were detected in areas near SCS; rather, we detected decreases in these areas. This runs counter to the rationale provided by policymakers poised to close SCS in Ontario, who have claimed that SCS promote drug-related crime, including homicides,[6] without providing evidence to support this claim.

Our analyses did include the COVID-19 pandemic period, however, during which people experiencing homelessness were relocated from Toronto's downtown core (where the city's SCS are located) to COVID-19

shelter hotels in Toronto's northern neighborhoods (where no SCS have been implemented).[27] These exogenous factors may have reduced the population density in areas proximal to SCS more than in other areas, and could have plausibly had a deterrent effect on homicides. However, the majority of SCS were implemented in the years 2017 and 2018 in our setting, and we did not observe any meaningful differences in rate ratios across zones 18 months pre vs. post SCS implementation, an observation period that preceded the imposition of COVID-19 restrictions beginning in March 2020.[28]

This study has limitations. Given that we performed ecological analyses, we cannot assume a causal relationship between SCS and homicides; in particular, caution is warranted in interpreting results demonstrating relative increases in homicides in areas further away from SCS after their implementation. Data were also restricted to fatal shootings and stabbings, and did not include all drug market-related threats to public safety (e.g., non-fatal violent crime). This is important as we cannot assume that fatal shootings are a proxy for these phenomena, and future research should investigate the spatial association between SCS and other threats to public safety in Toronto. Finally, while we employed population-level data across the city of Toronto, our findings cannot be assumed to be generalizable elsewhere.

In sum, we did not detect a meaningful spatial association between the implementation of SCS and the rates of fatal shootings and other homicides in Toronto across a 13-year period. These findings should be helpful in informing SCS policy and responding to community public safety needs.

Contributors

DW contributed to conceptualization, analytic guidance, manuscript writing, and study leadership, data access and verification; HSS contributed to analysis and manuscript drafting; YN contributed to analysis, data access and verification; IR contributed to data curation; JE contributed to study leadership, manuscript revision, supervision; AS contributed to editing, revision, and interpretation; AO-B contributed to writing editing, revision, and interpretation; TK contributed to editing, revision, and interpretation; MK contributed to study leadership, analytic guidance, editing, revision, and interpretation. All authors had full access to all the data in the study, have seen and approved of the final text, and had final responsibility for the decision to submit for publication.

Data sharing statement

Individual data from this study are restricted by a data sharing agreement with the Office of the Chief Coroner of Ontario. The study protocol and statistical analysis plan will be shared on request following publication to investigators whose proposed use of the data has been approved by an independent review committee identified for this purpose, to achieve aims in the approved proposal. Individuals can request to become an approved investigator, or to learn more about conditions of data access, by contacting the Centre on Drug Policy Evaluation at info@cdpe.org.

Editorial disclaimer

The Lancet Group takes a neutral position with respect to territorial claims in published maps and institutional affiliations.

Declaration of interests

DW holds an equity position in a private company developing a mobile drug checking technology. All other authors declare no competing interests.

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References

1 Potier C, Laprevote V, Dubois-Arber F, Cottencin O, Rolland B. Supervised injection services: what has been demonstrated? A systematic literature review. *Drug Alc Depend*. 2014;145:48–68.
2 Levengood TW, Yoon GH, Davoust MJ, et al. Supervised injection facilities as harm reduction: a systematic review. *Am J Prev Med*. 2021;61(5):738–749.
3 City of Toronto. *Supervised consumption services*; 2023. https://www.toronto.ca/community-people/health-wellness-care/health-programs-advice/supervised-injection-services/. Accessed December 2, 2024.
4 Draaisma M. *Ontario launches review into drug consumption sites after Toronto shooting*. CBC News; 2023. https://www.cbc.ca/news/canada/toronto/ontario-review-drug-consumption-toronto-fatal-shooting-1.6938676. Accessed November 19, 2024.
5 Casey L. *Ontario pauses new supervised consumption site approvals pending review*. CBC News; 2023. https://www.cbc.ca/news/canada/toronto/ont-consumption-sites-1.6988148. Accessed November 2, 2024.
6 Jabakhanji S. *Province to close 5 Toronto supervised drug consumption sites*. CBC News; 2024. https://www.cbc.ca/news/canada/toronto/toronto-supervised-injection-sites-ontario-restrictions-1.7299398. Accessed November 2, 2024.
7 Callan I, D'Mello C. *Ontario tables law banning supervised consumption sites, saying there will be no more | Globalnews.ca*. *Global News Toronto*; 2024. https://globalnews.ca/news/10875443/ontario-supervised-consumption-site-law-tabled/. Accessed December 2, 2024.
8 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. *Subst Abuse Treat Prev Policy*. 2006;1(13).
9 Greenwald Z, Bouck Z, Eeuwes J, et al. *Exploring the impact of supervised consumption service use on public injecting in Toronto, Canada. 12th international conference on health and hepatitis in substance users*. Athens: International Network on Health and Hepatitis C in Substance Users; 2024.
10 Wood E, Kerr T, Small W, et al. Changes in public order after the opening of a medically supervised safer injecting facility for illicit injection drug users. *CMAJ*. 2004;171(7):731–734.
11 Davidson PJ, Lambdin BH, Browne EN, Wenger LD, Kral AH. Impact of an unsanctioned safe consumption site on criminal activity, 2010–2019. *Drug Alc Depend*. 2021;220:108521.
12 Chalfin A, Del Pozo B, Mitre-Becerril D. Overdose prevention centers, crime, and disorder in New York City. *JAMA Network Open*. 2023;6(11):e2342228. https://doi:10.1001/jamanetworkopen.2023.42228.
13 Hall JJ, Ratcliffe JH. Assessing the impact of safe consumption sites on neighborhood crime in New York City: a synthetic control approach. *J Exper Criminol*. 2024:1–16.
14 Kolla G, Strike C, Watson TM, Jairam J, Fischer B, Bayoumi AM. Risk creating and risk reducing: community perceptions of supervised consumption facilities for illicit drug use. *Health Risk Society*. 2017;19(1–2):91–111.

15 Rammohan I, Gaines T, Scheim A, Bayoumi A, Werb D. Overdose mortality incidence and supervised consumption services in Toronto, Canada: an ecological study and spatial analysis. *Lancet Public Health*. 2024;9(2):e79–e87.
16 Kennedy MC, Karamouzian M, Kerr T. Public health and public order outcomes associated with supervised drug consumption facilities: a systematic review. *Curr HIV/AIDS Rep*. 2017;14(5):161–183.
17 Taylor J, Ober AJ, Kilmer B, Caulkins JP, Iguchi MY. Community perspectives on supervised consumption sites: insights from four US counties deeply affected by opioids. *J Subst Abuse Treat*. 2021;131:108397.
18 Chambers LC, Hallowell BD, Zang X, et al. The estimated costs and benefits of a hypothetical supervised consumption site in Providence, Rhode Island. *Int J Drug Pol*. 2022;108:103820.
19 Benchimol EI, Smeeth L, Guttmann A, et al. The REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) statement. *PLoS Med*. 2015;12(10):e1001885. https://doi.org/10.1371/journal.pmed.1001885.
20 Golyandina N. Particularities and commonalities of singular spectrum analysis as a method of time series analysis and signal processing. *Wiley Interdiscip Rev Comput Stat*. 2020;12(4):e1487.
21 Previous censuses. Statistics Canada. https://www12.statcan.gc.ca/census-recensement/pc-eng.cfm; 2023. Accessed April 9, 2024.
22 Schaffer AL, Dobbins TA, Pearson S-A. Interrupted time series analysis using autoregressive integrated moving average (ARIMA) models: a guide for evaluating large-scale health interventions. *BMC Med Res Methodol*. 2021;21(1):58.
23 Donnelly N, Mahoney N. Trends in property and illicit drug crime around the medically supervised injecting Centre in kings cross: 2012 update. https://bocsar.nsw.gov.au/content/dam/dcj/bocsar/documents/publications/bb/bb01-100/bb51.pdf; 2013. Accessed December 16, 2024.
24 Freeman K, Jones CG, Weatherburn DJ, Rutter S, Spooner CJ, Donnelly N. The impact of the sydney medically supervised injecting Centre (MSIC) on crime. *Drug Alc Rev*. 2005;24(2):173.
25 Myer AJ, Belisle L. Highs and lows: an interrupted time-series evaluation of the impact of North America's only supervised injection facility on crime. *J Drug Issues*. 2018;48(1):36–49.
26 Toronto Public Health. Toronto overdose information system. https://public.tableau.com/profile/tphseu#!/vizhome/TOISDashboard_Final/ParamedicResponse; 2024. Accessed March 18, 2024.
27 Mitra S, Bouck Z, Larney S, et al. The impact of the COVID-19 pandemic on people who use drugs in three Canadian cities: a cross-sectional analysis. *Harm Reduct J*. 2024;21(1):94. https://doi.org/10.1186/s12954-024-00996-x.
28 Bouck Z, Scheim AI, Gomes T, Ling V, Caudarella A, Werb D. Evaluating interventions to facilitate opioid agonist treatment access among people who inject drugs in Toronto, Ontario during COVID-19 pandemic restrictions. *Int J Drug Policy*. 2022;104:103680.