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Factors associated with self-reported avoidance of harm reduction services during the COVID-19 pandemic by people who use drugs in five cities in the United States and Canada

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ABSTRACT

Background: This study examines individual-level factors associated with avoiding two important health services for people who use drugs—medications for treatment of opioid use disorder and syringe service programs—during the first year of the COVID-19 pandemic.

Methods: Data come from two subsamples of people who use drugs who were active participants in one of nine cohort studies in Vancouver, British Columbia; Baltimore, Maryland; Los Angeles, California; Chicago, Illinois; and Miami, Florida. Participants were interviewed remotely about COVID-19-associated disruptions to health-care. We estimated the association of demographic, social, and health factors with each outcome using logistic regression among 702 participants (medication analysis) and 304 participants (syringe service analysis.) Analyses were repeated, stratified by city of residence, to examine geographic variation in risk.

Results: There were large differences between cities in the prevalence of avoiding picking up medications for opioid use disorder, with almost no avoidance in Vancouver (3%) and nearly universal avoidance in Los Angeles, Chicago, and Miami (>90%). After accounting for between-city differences, no individual factors were associated with avoiding picking up medications. The only factor significantly associated with avoiding syringe service programs was higher levels of self-reported worry about COVID-19.

Conclusion: During the first year of the COVID-19 pandemic, geographic differences in service and policy contexts likely influenced avoidance of health and harm reduction services by people who use drugs in the United States and Canada more than individual differences between people.

1. Background

The COVID-19 pandemic has disrupted health and social services

worldwide. These interruptions are a result of both widespread closure of services deemed nonessential in order to reduce social interactions and slow the spread of the novel coronavirus that causes COVID-19, and

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voluntary avoidance of situations perceived to be high risk for contracting COVID-19. These non-pharmaceutical interventions reduced the incidence of COVID-19 (Auger et al., 2020; Bo et al., 2021; Chernozhukov et al., 2021; Courtemanche et al., 2020; Kaur et al., 2020; Lai et al., 2020), allowing time for the development of effective vaccines and preventing potentially tens of thousands of deaths. However, interventions also led to substantial disruption of health and healthcare services (Diaz et al., 2020; Goldman et al., 2020; Saxena et al., 2020), possibly at the expense of the health of people who relied on this medical care.

Disruptions caused by the COVID-19 pandemic may have been disproportionately harmful to people who use illicit drugs. Since March of 2020, the United States and Canada have experienced large increases in drug overdoses, overdose-related emergency department visits, and drug overdose deaths across multiple jurisdictions, particularly those involving stimulants and fentanyl (Appa et al., 2021; Gomes et al., 2021; Khoury et al., 2021; Soares et al., 2021; Vieson et al., 2021). While the cause of this increase is not fully understood, and could be multifactorial, disruptions in treatment and harm reduction services may have played a role.

In particular, there may have been disruptions in access to medications for opioid use disorder and/or syringe service programs. Medications such as methadone and buprenorphine reduce risk of overdose and improve functional outcomes for people with opioid use disorder (Volkow et al., 2014); however, the COVID-19 pandemic may have disrupted access to these medications. For example, from May to June of 2020, one study of a sample of methadone clinics in the United States and Canada found more than 1 in 10 were not taking any new patients, with greater barriers to access in the United States than Canada (Joudrey et al., 2021). Another survey of drug users from Baltimore conducted between April and June of 2020 found fewer than half of respondents on methadone treatment had a four-week supply of methadone available (Genberg et al., 2021).

Syringe service programs, where clients can obtain sterile syringes, reduce risk of HIV transmission among people who use drugs (Aspinall et al., 2014) and may facilitate access to other essential health services for people who use drugs like substance use treatment and infectious disease treatment (Centers for Disease Control and Prevention, 2019). However, the COVID-19 pandemic caused many syringe service programs to reduce services and sometimes to close (Bartholomew et al., 2020; Glick et al., 2020; Ostrach et al., 2021).

Qualitative studies of people who use drugs in both the United States and Canada suggest that service disruptions, combined with fear of COVID-19, led some people who use drugs to reduce their use of health and harm reduction programs (Galarneau et al., 2021; Gleason et al., 2021; Russell et al., 2021). The aggregate impact of these qualitative studies are corroborated by quantitative research showing visits to substance use treatment programs in 2020 were lower than the same time periods in 2019, with greater reductions in places experiencing more cases of COVID-19 (Cantor et al., 2021).

In summary, there is evidence the COVID-19 pandemic impeded access to important health services programs offering medicated treatment for opioid use disorder and syringe service programs, both because of reduced or disrupted operation of those programs, and also because program clients chose to avoid services because of fear of COVID-19. However, to date, there is no research documenting individual-level risk factors for eschewing or avoiding health and harm reduction services among people who use drugs. This in part reflects the challenge of recruiting and assessing risk in a sufficiently large sample of people who use drugs during a pandemic. However, understanding change in use of these services, and individual and community-level factors associated with this change, is key to future research that seeks to understand understanding how much and why outcomes related to infectious disease and overdose have changed among people who use drugs during the COVID-19 pandemic. However, understanding these risks is essential to mitigating their impact on service use, both in the context of the

current ongoing COVID-19 pandemic, and in the event of future crises that result in significant societal disruption.

This study uses data from a subset of participants with a history of illicit drug use recruited from a consortium of cohort studies actively following more than 12,000 people in the United States and Canada to examine self-reported COVID-19 pandemic-related disruption in two harm reduction services—1) use of medications for opioid use disorder and 2) use of syringe service programs—among people who have injected drugs during the COVID-19 pandemic. We focus on a limited but important set of characteristics that were assessed in all cohort studies and either relate to core demographic characteristics (e.g., age, HIV status) or pandemic-related attitudes and behaviors (e.g., fear of COVID-19). It seeks to answer the following questions:

1. What characteristics were associated with avoiding picking up medications for opioid use disorder treatment and how did these associations vary by place?
2. What characteristics were associated with avoiding use of syringe services and how did these associations vary by place?

2. Methods

2.1. Study population

Data come from the Collaborating Consortium of Cohorts Producing NIDA Opportunities (C3PNO): a consortium of nine cohort studies with more than 6000 active participants funded in part or in full by the United States National Institute on Drug Abuse (NIDA) to study HIV/AIDS and related outcomes in people who use drugs (“C3PNO,” n.d.). The cohorts are spread across five cities in the United States and Canada: Baltimore, MD; Vancouver, BC; Miami, FL; Los Angeles, CA; and Chicago, IL. Recruitment and protocols for each cohort are described elsewhere (Gorbach et al., 2021).

In response to the COVID-19 pandemic, investigators in each cohort deployed a supplemental questionnaire examining COVID-19 related factors such as disruptions to healthcare or harm reduction services resulting from the pandemic, self-reported history of COVID-19 testing or infection, self-reported history of vaccination and attitudes about vaccination, adoption of COVID-19 safety measures, and general mental health questions. C3PNO participants were recruited for participation in this supplemental survey if they had attended a regular study visit during the 12 months prior to March, 2020, and were able and willing to complete the interview remotely. Data were collected between May, 2020, and March, 2021. All data – including both the COVID-19 supplement and general study questionnaires – were collected through telephone interviews or online forms to accommodate social distancing precautions. Participants received compensation for completing the interview. The study was approved by the institutional review/research ethics boards of the member cohorts and each participant provided informed consent for their study participation.

Data from this analysis are drawn from two sub-samples of individuals who completed the C3PNO COVID-19 supplement: 1) To analyze disruptions in use of medication treatment for opioid use disorder, we included 702 participants (310 from Vancouver, 232 from Baltimore, 26 from Chicago, 39 from Los Angeles, 95 from Miami) who either a) reported any recent methadone treatment on their most recently completed study questionnaire or b) reported avoiding picking up medications for opioid use disorder, and c) for whom complete data was available for all other covariates of interest. 2) To analyze disruptions in syringe services program use, we included 304 participants (223 from Vancouver, 36 from Baltimore, 6 from Chicago, 39 from Los Angeles, 0 from Miami) who a) reported any injection drug use in the past month on their most recently completed study questionnaire, and b) for whom complete data was available for all other covariates of interest.

Detailed dates of collection and response rates for each cohort and

for the full survey are shown in [Appendix A](#).

2.2. Study variables

2.2.1. Outcomes. We examined two self-reported outcomes

2.2.1.1. Self-reported avoidance of medication for opioid use disorder dispensation. Defined as responding affirmatively to the statement “In the past month, because of the COVID-19 pandemic I have avoided picking up medications for opioid use disorder.”

2.2.1.2. Self-reported avoidance of syringe-service programs. Defined as responding affirmatively to the statement “In the past month, because of the COVID-19 pandemic I have avoided needle distribution sites.”

2.2.2. Covariates

The following characteristics were examined as potential self-reported correlates of avoidance of methadone dispensation programs and syringe-service programs: age (18–48, 50+) sex (male, female), self-reported racial/ethnic group (not white, white), homelessness status (lived in a house or apartment, lived in any other setting), high levels of worry about COVID-19 bottom three quartiles on 10-point Likert-type scale, top-quartile on a 10-point Likert-type scale) self-reported stocking up on drugs in the past month (no, yes), self-reported ever having been tested for COVID-19 (no, yes), number of contacts interacted with to obtain or use drugs (top quartile of number of contacts, all others), number of sex partners (top quartile, all others), HIV status as of the most recent study visit where blood was drawn (negative, positive), cohort location (Vancouver, Baltimore, Chicago, Los Angeles, Miami), and date of survey completion (before October 1, 2020, after October 1, 2020). One covariate was different between the two outcomes: for the analysis of methadone dispensation avoidance, we examined self-reported use of any opioid other than as prescribed by a health professional (non-daily use in last month, daily use in last month); for syringe-service avoidance, we examined self-reported injecting of opioids other than as prescribed by a health professional (not in last month, yes in last month).

2.3. Analytic approach

The analytic approach is the same for each study outcome, so we refer generally below to “harm reduction outcomes.”

2.3.1. Main analysis

For the main analysis we estimated the crude association of each harm reduction outcome with each covariate using univariable logistic regression. We then estimated the independent association of each covariate with each outcome using multiple logistic regression models that included all covariates at once. Regression coefficients are exponentiated and interpreted as odds ratios.

2.3.2. Stratified analysis

Because of different health service and policy contexts, the associations of each covariate with each outcome might be different depending on city of residence. For this reason, we stratified the sample by city of residence, and repeated the entire main analysis separately for each city. This analysis was constrained by small samples, and so stratified analysis was only conducted in cities with more than 50 respondents: Vancouver, Baltimore, and Miami for the MOUD outcome, and Vancouver for the syringe service outcome. Further, covariates were not analyzed if there was no variation among participants in a jurisdiction (e.g., if 100% participants were male).

95% profile likelihood confidence intervals were estimated for each odds ratio reported; confidence intervals not containing 1 are statistically significant at the $p < .05$ level.

All analyses were conducted R (version 4.0.5).

3. Results

3.1. Medications for opioid use disorder

3.1.1. Main analysis

Of the 702 C3PNO respondents who completed the COVID-19 supplemental questionnaire and met all inclusion criteria, 178 (25.4%) reported avoiding picking up medications for opioid use disorder treatment. There were large differences between cities, with avoidance prevalences of 2.6% in Vancouver, 8.6% in Baltimore, 92.3% in Chicago, 84.6% in Los Angeles, and 97.9% in Miami. In crude analysis, a number of characteristics were associated with avoidance ([Table 1](#)); however, in adjusted analysis—including adjustment for city where the study was located—there were no statistically significant associations with avoidance. ([Table 1](#)).

3.1.2. Stratified analysis

3.1.2.1. Vancouver. In Vancouver ($n = 310$), no covariates were significantly associated with avoiding medication for opioid use disorder treatment in either univariable or multivariable analysis.

3.1.2.2. Baltimore. In Baltimore ($n = 232$), daily opioid use was associated with avoiding picking up medications for opioid use disorder (crude OR 8.58, 95% CI 2.03–33.3; adjusted OR 33.93, 95% CI 5.02–275.6).

3.1.2.3. Miami. In Miami ($n = 95$), no covariates were significantly associated with avoiding medication for opioid use disorder treatment in either univariate or multivariate analysis.

3.2. Syringe service avoidance

3.2.1. Main analysis

Of the 304 C3PNO respondents who completed the COVID-19 supplemental questionnaire and reported recently injecting opioids, 36 (11.8%) reported avoiding syringe service programs. Avoiding syringe service programs was more common in Baltimore (30.6%) than Los Angeles (12.8%) and Vancouver (9.0%); no respondents from Chicago reported avoiding syringe service programs; no Miami respondents met inclusion criteria for this analysis. In crude analysis, being in the highest quartile for self-reported worry about COVID-19 was associated with risk for avoiding syringe service programs (OR 3.64, 95% CI 1.66–7.76). That association persisted in adjusted analysis (OR 3.88, 95% CI 1.51–10.05). ([Table 2](#)).

3.2.2. Stratified analysis

3.2.2.1. Vancouver. In Vancouver ($n = 223$), being in the highest quartile for self-reported worry about COVID-19 was associated with risk for avoiding syringe service programs (crude OR 4.21, 95% CI 1.46–11.44; adjusted OR 5.70 1.61–20.78). In addition, participants interviewed after October 1st were less likely to report avoiding syringe service programs (crude OR 0.28, 95% CI 0.08–0.81; adjusted OR 0.27, 95% CI 0.07–0.81).

4. Discussion

In this analysis of 702 people who had been on methadone treatment in the United States and Canada, approximately one quarter reported avoiding picking up medications because of the COVID-19 pandemic. However, this number masks enormous disparities between countries and cities: in Vancouver, almost no respondents reported avoiding

Table 1

Characteristics of people who self-reported avoidance of medication treatment for opioid use disorder among people (n = 702) who have been on methadone treatment – United States and Canada, May 2020 - March 2021.

Covariate	Total		Self-Reported Avoid MOUD		Crude association	Adjusted association
	N	Column %	n	%	Odds Ratio (95% Confidence Interval)	Odds ratio (95% Confidence Interval)
Total	702	100	178	25.36	NA	NA
Age						
18–49	289	41.17	82	28.37	ref	ref
50 +	413	58.83	96	23.24	0.76 (0.54–1.08)	1.34 (0.55–3.47)
Sex						
M	422	60.11	121	28.67	ref	ref
F	280	39.89	57	20.36	0.64 (0.44–0.91)	0.73 (0.32–1.6)
Racial/Ethnic Group						
Not White	464	66.1	155	33.41	ref	ref
White	238	33.9	23	9.66	0.21 (0.13–0.34)	0.77 (0.3–1.93)
Homeless						
No	520	74.07	160	30.77	ref	ref
Yes	182	25.93	18	9.89	0.25 (0.14–0.41)	0.93 (0.34–2.42)
How worried are you about COVID-19?						
All others	549	78.21	124	22.59	ref	ref
Highest quartile of worry	153	21.79	54	35.29	1.87 (1.26–2.75)	1.2 (0.52–2.67)
Stocked up on drugs?						
No	634	90.31	162	25.55	ref	ref
Yes	68	9.69	16	23.53	0.9 (0.48–1.58)	1.28 (0.36–4.01)
Tested for COVID-19?						
Never	263	37.46	12	4.56	ref	ref
Yes, at least once	439	62.54	166	37.81	12.72 (7.2–24.65)	0.58 (0.23–1.52)
How many people interacted with for drugs?						
All others	533	75.93	156	29.27	ref	ref
Highest quartile of contacts	169	24.07	22	13.02	0.36 (0.22–0.58)	1.22 (0.5–2.84)
Number of sex partners?						
All others	645	91.88	155	24.03	ref	ref
Highest quartile of sex partners	57	8.12	23	40.35	2.14 (1.21–3.72)	0.37 (0.09–1.36)
HIV Status						
Negative	432	61.54	95	21.99	ref	ref
Positive	270	38.46	83	30.74	1.57 (1.11–2.22)	0.71 (0.32–1.5)
Daily opioid use?						
No	630	89.74	168	26.67	ref	ref
Yes	72	10.26	10	13.89	0.44 (0.21–0.85)	3.1 (0.98–9.17)
Location						
Vancouver	310	44.16	8	2.58	ref	ref
Baltimore	232	33.05	20	8.62	3.56 (1.59–8.73)	4.8 (1.56–15.88)
Chicago	26	3.70	24	92.31	453 (111.16–3154.87)	988.86 (143.58–10341.85)
Los Angeles	39	5.56	33	84.62	207.62 (73.15–697.87)	608.56 (107.78–4338.37)
Miami	95	13.53	93	97.89	1755.37 (453.69–11929.52)	3445.1 (629.97–29536.61)
Collection Date						
< =September 30, 2020	428	60.97	94	52.81	ref	ref
> = Oct 1, 2020	274	39.03	84	30.66	1.57 (1.11–2.22)	1.14 (0.52–2.43)

picking up medications for opioid use disorder, while in Chicago, Los Angeles, and Miami, most respondents did; Baltimore one-in-twelve reported avoidance. These wide disparities are consistent with other research on methadone access during the COVID-19 pandemic, and may reflect differences in regulatory context between Canada and the United States: in the United States, methadone can only be administered/dispensed as specialty Opioid Treatment Programs (OTP), and buprenorphine can only be prescribed by physicians who complete special training and receive a waiver to do so. By contrast, in Canada, methadone treatment is more integrated into general medical care and can be prescribed or administered by many physicians and dispensed at pharmacies, and buprenorphine can be prescribed by any physician (Joudrey et al., 2021). Similarly, in Vancouver, local health authorities recognized substance use services (including MOUD dispensaries, detox, supervised injection facilities, etc.) to be essential services during the COVID-19 pandemic.

Importantly, the United States made emergency policy changes during the COVID-19 pandemic, permitting states to in turn permit patients already initiated on methadone treatment to receive 14 or 28 days of take-home medication from an OTP, and permitting buprenorphine prescriptions to be initiated following a telemedicine visit with a licensed provider (whereas previously an in-person visit was required)

(Davis and Samuels, 2020). There is evidence of widespread adoption of these options—including expanded use of telemedicine for addiction treatment and buprenorphine prescribing and expanded use of two- and four-week take-home methadone dispensation—with no accompanying evidence of reduction in care quality or harm to clients associated with this adoption (Brothers et al., 2021; Buchheit et al., 2021; Castillo et al., 2020; Clark et al., 2021; Figgatt et al., 2021; Tofighi et al., 2021; Uscher-Pines et al., 2020). Maintaining this enhanced flexibility—even after the need for acute social distancing to prevent transmission of the virus that causes COVID-19 dissipates—may be appropriate (Clark et al., 2021; Davis and Samuels, 2020; Joudrey et al., 2021).

After accounting for differences across jurisdiction, no individual characteristics were associated with self-reported avoidance of picking up medications for opioid use disorder. This suggests the local policy and service context was much more important for preserving access to these medications than characteristics of individual clients. The only exception was, in stratified analysis, in Baltimore—the only city with meaningful variation in self-reported avoidance of picking up medications—daily opioid use was strongly associated with not picking up medications. Unfortunately, this suggests one of two possibilities: either these individuals were least able to adapt to the changes in service use required by the pandemic, or conversely that not picking up

Table 2

Characteristics of people who self-reported avoidance of syringe service programs among people (n = 304) who have injected drugs.

Covariate	Total		Self-Reported Avoid Syringe Service		Crude Association	Adjusted Association
	N	Column %	n	%	Odds Ratio (95% Confidence Interval)	Odds Ratio (95% Confidence Interval)
Total	304	100	36	11.84	NA	NA
Age						
18–49	186	61.18	20	10.75	ref	ref
50 +	118	38.82	16	13.56	1.3 (0.64–2.62)	0.71 (0.29–1.68)
Sex						
M	204	67.11	28	13.73	ref	ref
F	100	32.89	8	8.00	0.55 (0.22–1.2)	0.5 (0.18–1.24)
Racial/Ethnic Group						
Not White	154	50.66	19	12.34	ref	ref
White	150	49.34	17	11.33	0.91 (0.45–1.83)	1.34 (0.58–3.18)
Homeless						
No	149	49.01	24	16.11	ref	ref
Yes	155	50.99	12	7.74	0.44 (0.2–0.89)	0.67 (0.28–1.56)
How worried are you about COVID-19?						
All others	255	83.88	23	9.02	ref	ref
Highest quartile of worry	49	16.12	13	26.53	3.64 (1.66–7.76)	3.88 (1.51–10.05)
Stocked up on drugs?						
No	230	75.66	28	12.17	ref	ref
Yes	74	24.34	8	10.81	0.87 (0.36–1.93)	1.04 (0.4–2.48)
Tested for COVID-19?						
Never	160	52.63	18	11.25	ref	ref
Yes, at least once	144	47.37	18	12.50	1.13 (0.56–2.27)	0.72 (0.27–1.78)
How many people interacted with for drugs?						
All others	244	80.26	30	12.30	ref	ref
Highest quartile of contacts	60	19.74	6	10.00	0.79 (0.29–1.88)	0.69 (0.22–1.84)
Number of sex partners?						
All others	234	76.97	30	12.82	ref	ref
Highest quartile of sex partners	70	23.03	6	8.57	0.64 (0.23–1.5)	0.69 (0.2–2.07)
HIV Status						
Negative	196	64.47	20	10.20	ref	ref
Positive	108	35.53	16	14.81	1.53 (0.75–3.09)	1.35 (0.57–3.13)
Inject opioids?						
No	150	49.34	17	11.33	ref	ref
Yes	154	50.66	19	12.34	1.1 (0.55–2.23)	0.83 (0.35–1.94)
Location						
Vancouver	223	73.36	20	8.97	ref	ref
Baltimore	36	11.84	11	30.56	4.47 (1.88–10.31)	3.59 (1.2–10.88)
Chicago	6	1.97	0	0.00	NA	NA
Los Angeles	39	12.83	5	12.82	1.49 (0.47–3.98)	1.1 (0.2–5.76)
Miami	0	0	0	0.00	NA	NA
Collection Date						
< =September 30, 2020	180	59.21	25	13.89	ref	ref
> = Oct 1, 2020	124	40.79	11	8.87	0.6 (0.28–1.25)	0.7 (0.3–1.57)

medication was a cause of daily drug use. It is not possible to tell from this study which explanation is more plausible.

Differences between jurisdictions were not as large for syringe service program avoidance. Sample size differences between cities, with Vancouver being the only city with more than 100 eligible respondents, make generalizing inference across jurisdictions difficult. In Vancouver, the only factors associated with syringe service avoidance were 1) being very worried about COVID-19 and 2) attending a study visit after October 1st. The former is self-explanatory. The latter is notable because COVID-19 incidence in British Columbia was substantially higher after October 1st than before (“[B.C. COVID-19 Dashboard](#),” n.d.), so these later respondents actually faced a more dangerous COVID-19 environment. Reduced avoidance of syringe service programs may reflect general numbing to the impacts of COVID-19, or improved safety practices from syringe service programs later in the pandemic.

This study has a number of limitations. First, and most important, the majority of participants in C3PNO cohorts were not included in this analysis because they did not complete the COVID-19 supplement. Participants who did not complete the supplement—many of whom could not be reached during the pandemic—may have had different rates of avoidance of harm reduction services, and different risk factors for avoidance. Second, more generally, the participants of these cohort studies are not representative of people who use drugs in the United

States and Canada, as all five studies are located in major metropolitan areas. Third, the large differences between cities in harm reduction avoidance make interpreting average avoidance prevalences and risk factors difficult. City-specific estimates are likely more interpretable. Fourth, sample sizes were small, making identification of significant differences for anything other than very substantial risk or protective factors difficult. Fifth, interpreting results of adjusted analysis from multiple regression in the absence of a causal hypothesis or analysis focused on a single risk factor of interest is challenging ([Westreich and Greenland, 2013](#)). This is because some variables may mediate the effect of others on the outcome of interest; adjustment therefore blocks part of the causal pathway for some variables. In this analysis, adjusted results are important because they show most between-group differences in the outcome of interest are explained by differences in the distribution of those characteristics between cohort jurisdictions. However, odds ratios shown here should not be given a strict causal interpretation, and instead should be interpreted simply as the association of each risk factor with the outcome after adjusting for the presence of all other listed risk factors. Sixth, while we present crude and adjusted estimates for each covariate, we cannot rule out the possibility observed associations presented are confounded by unmeasured variables; an example might be underlying chronic disease risk which both increases risk for fear of COVID-19 and being unable to access needle

exchange services. Seventh, not all cohorts collected pre-pandemic data on buprenorphine use. Therefore, buprenorphine use could not be included as part of the inclusion criteria for the “picking up medications” outcome. Eighth, the outcome assessed in this study was self-reported service avoidance; self-report may not be reliable, or subject to differences in interpretation of the question. Finally, no hypothesis was specified a priori about which risk factors would be associated with avoiding harm reduction services, and this analysis should be considered exploratory.

Despite these limitations, this study provides important new data about avoidance of medication for opioid use disorder and syringe service programs across jurisdictions. It suggests that, other than individual differences in fear of COVID-19 local service and policy contexts were much more important for determining whether people accessed these health and harm reduction services than individual differences in other characteristics between people who use drugs. Findings should inform policy efforts to increase the accessibility and flexibility of these programs: to help navigate the remainder of this pandemic and be better prepared for future disasters that may impede access to essential important public health services.

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Conflicts of interest

Dr. Milloy holds the Canopy Growth professorship in cannabis science at the University of British Columbia, a position established through arm’s length gifts to the university from Canopy Growth, a licensed producer of cannabis, and the Government of British Columbia’s Ministry of Mental Health and Addictions. He has no financial relationships with the cannabis industry.

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Contributors

Dr. Feder drafted all sections the manuscript, with assistance from Ms. Schluth. Mr. Choi conducted data analysis. Drs. Feder, Milloy, and Genberg developed the analysis plan. All co-authors assisted in developing the study, in managing data collection and implementation in their respective cohort studies, and in editing and revising the manuscript.

Appendix A. Sample sizes, response rates, and inclusion rates after applying eligibility criteria

Study	City	Start of Data Collection	End of Data Collection	Cohort Members With At Least 1 2019 Visit		Completed COVID-19 Survey		Medication for opioid use disorder		Syringe service programs	
				n	% Total	n	% 2019 Members	n	% Survey Completers	n	% Survey Completers
ACCESS	Vancouver	7/17/2020	4/1/2021	464	7%	270	58.2%	102	37.8%	65	24.1%
ALIVE	Baltimore	6/30/2020	11/17/2020	1042	16%	492	47.2%	196	39.8%	33	6.7%
ARYS	Vancouver	7/20/2020	4/6/2021	422	6%	263	62.3%	45	17.1%	40	15.2%
Heart Study	Baltimore	2/3/2021	3/29/2021	450	7%	148	32.9%	0	0.0%	0	0.0%
HYM	Los Angeles	6/12/2020	1/14/2021	418	6%	345	82.5%	9	2.6%	4	1.2%
JHHCC	Baltimore	6/8/2020	12/5/2020	1001	15%	227	22.7%	36	15.9%	3	1.3%
MASH	Miami	7/31/2020	3/29/2021	829	13%	330	39.8%	95	28.8%	0	0.0%
mSTUDY	Los Angeles	5/11/2020	12/6/2020	349	5%	340	97.4%	30	8.8%	35	10.3%
RADAR	Chicago	9/11/2020	4/16/2021	878	13%	457	52.1%	26	5.7%	6	1.3%
VIDUS2	Vancouver	7/17/2020	4/8/2021	688	11%	351	51.0%	163	46.4%	118	33.6%
Total		5/11/2020	4/16/2021	6541	100%	3223	49.3%	702	21.8%	304	9.4%

Appendix B. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.drugalcdep.2022.109544](https://doi.org/10.1016/j.drugalcdep.2022.109544).

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