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Estimated effect of US state syringe sale policy on source of last-used injection equipment.

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Abstract

Background: Many people who inject drugs (PWID) lack access to a new sterile syringe each time they inject, with increased risk of injection-related harms, including spread of communicable diseases. In the United States (US), restricted access is largely due to state laws and policies regulating syringe access. Our aim in this US-focused study is to estimate variations in syringe acquisition behavior in relation to state-level syringe sale policies, drawing upon self-identified PWID in a nationally representative sample survey.

Methods: Estimates were obtained on the source of the last used syringe from participants of the National Survey on Drug Use and Health (NSDUH) years 2002-2011. States were classified as having restricted syringe policies if they had any restriction on the sale of syringes during the study period (e.g., required a prescription or limited the number being sold).

Results: In states with unrestricted syringe sale policies, PWID were more likely to have obtained their most recently used syringe from a safe source (Difference (%) = 9.8, 95% CI: 1.9, 17.7). This difference was largely driven by a larger percent of injectors obtaining syringes from a pharmacy in unrestricted states (Difference = 20.4, 95% CI: 12.2, 28.6) but was partially offset by fewer injectors obtaining syringes from syringe exchange programs (Difference = -10.7, 95% CI: -16.1, -5.3).

Conclusion: These new findings, taken with other evidence, should help promote removal of policy barriers that now thwart syringe acquisition from a safe source. We hope this additional evidence will provoke policy discussions and may influence regulations that promote public health and reduce the spread of communicable diseases.

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Keywords

people who inject drugs; syringe sale; syringe policy; HIV; HCV

Introduction

In the United States (US), people who inject drugs (PWID) continue to experience heightened risk for contracting communicable diseases, including the human immunodeficiency virus and hepatitis C virus (Degenhardt et al., 2013; Zibbell et al., 2018). Evidence suggests that a 'syringe gap' continues to exist between the number of injections made and the number of sterile syringes acquired by PWID (Heller, Paone, Siegler, & Karpati, 2009; Nguyen, Weir, Des Jarlais, Pinkerton, & Holtgrave, 2014; Tempalski et al., 2008). Estimates of the syringe gap have suggested only 3 to 18 syringes are distributed for every 100 injection events, indicating a substantial disparity between the availability of syringes from safe sources and the frequency of injection drug use (Nguyen et al., 2014; Tempalski et al., 2008). Nonetheless, several studies have found that deregulating the sale of syringes increases the use of pharmacies as a source of syringes (Cotten-Oldenburg, Carr, DeBoer, Collison, & Novotny, 2001; Des Jarlais, McKnight, & Friedmann, 2002; Fuller et al., 2002; Groseclose et al., 1995; Siddiqui et al., 2015). Yet, alternative explanations for variation in pharmacy syringe acquisition include location of and access to pharmacies across rural versus urban communities (Compton et al., 2004), as well as disparities connected to race/ethnicity (Cooper, Bossak, Tempalski, Friedman, & Des Jarlais, 2009). However, studies examining the association between syringe sale policy and syringe acquisition have largely been based on comparisons between a small number of states or examined specific situations where a single state liberalized syringe laws.

In this study, our aim is to estimate variations in syringe acquisition behavior in relation to state-level syringe sales policies, with due attention to issues raised in past research on variations across rural/urban locations and race/ethnic subgroups. In a departure from most injection drugs research with respondent-driven sampling and related approaches for difficult-to-reach individuals, this study's estimates are based on an attempt to derive a nationally representative sample of persons who inject drugs.

Methods

The NSDUH is administered each year by the Substance Abuse and Mental Health Services Administration (SAMHSA). The multistage probability design attempts to accurately represent all adolescents and civilian non-institutionalized adults in all 50 US States and the District of Columbia (2018). Each year, NSDUH seeks a nationally representative sample (n~65,000 individuals), age 12 years and older, used to reach designated respondents living not only in households, but also in homeless shelters and other non-institutional group quarters and dwelling units. Participation levels during the 2002-2011 interval for which state-level variables are available ranged upward from 70% for most subgroups, offset somewhat by impediments associated with the NSDUH confidential (rather than completely anonymous) informed consent procedures for adults, as well as combined parent-consent

and child-assent procedures approved by cognizant institutional review boards. Detailed documentation on this study exists elsewhere, primarily in online reports and a growing number of peer-reviewed articles (Parker & Anthony, 2014; Seedall & Anthony, 2013; Vsevolozhskaya & Anthony, 2014).

After informed consent procedures (or consent-assent procedures), all NSDUH designated respondents complete confidential (but not anonymous) audio computer assisted self-interviews (ACASI) with standardized items and item sets, keying answers into a laptop computer in a fashion intended to enhance privacy, accuracy, and completeness of reporting on sensitive and potentially illegal behaviors, such as PWID status. A small fraction of designated respondents makes use of a paper-and-pencil self-administered questionnaire option, but this was rarely the case for the relatively young PWID under study here.

For the most part, the NSDUH datasets generally do not include the state level variables required to complete data linkage studies of the type seen here. However, it is possible to secure the state-level variables using the public use datasets known as the Restricted Use Online Data Analysis System (R-DAS). The R-DAS thwarts re-identification of participants and protects their privacy by limiting the end-user to a restricted set of online analyses for multi-way contingency tables. As such, R-DAS provides weighted estimates for table cells, margins, and totals, but does not disclose the unweighted cell counts or totals (i.e., sample sizes) or allow for more advanced multivariate analysis such as multiple regression. Nevertheless, R-DAS datasets have the advantage of including NSDUH variables such as the state of residence, which are not made available in the downloadable NSDUH public use files, which permit multiple regression analyses and other statistical models (e.g., see Vsevolozhskaya & Anthony, 2014). A current version of R-DAS is accessible online (SAMHSA, 2019) but all analysis was performed using the previously available system that allowed for a larger number of filter variables for subpopulation estimates while still censoring for small cell counts to avoid re-identification of participants.

As for area-linked variables on syringe policies, we turned to the LawAtlasSM Syringe Distribution data, which can be used to classify states (and Washington D.C.) on state syringe policy, to code states for syringe sale restrictions in relation to two categories: those with restricted syringe sale, and those allowing unrestricted syringe sale (National Program Office for Public Health Law Research, 2013b). States were classified as restricting syringe sale if state law from 2002 to 2012 included any of the restrictions on the sale of syringes such as: requiring a prescription, requiring collection of purchaser information (e.g., requiring the seller to obtain the purchaser's name or purpose of purchasing the syringe), placing limits on the amount of syringes sold, prohibiting purchases by minors, requiring syringes to be stored in restricted areas, or requiring retailers to form a presumption of the legality of the purchase (National Program Office for Public Health Law Research, 2012). States laws and regulations were coded by two legal researchers in consultation with topic experts. Comprehensive details about the coding procedure are presented elsewhere (National Program Office for Public Health Law Research, 2013a). Importantly, this coding was conducted to identify the laws in force in July, 2012. However, the classification for the current study was chosen so no state switched categories between 2002 and 2012. That is, whereas the study occurred during a period of liberalization in syringe laws in the US and

several states changed syringe sales policies during the study period of 2002–2011,¹ no state that altered their syringe laws during the study period was coded as “unrestricted” because all states that liberalized their policies still kept in place at least one or more of the aforementioned restrictions. Accordingly, given this broad classification, this variable accurately reflected a crude categorization of the syringe policy for each state during the entire study interval of 2002 to 2012. While a detailed year by year analysis to examine within-state variation in acquisition behavior before and after syringe policy change would be ideal, this analysis was not possible because the number of participants within each state during each year is below the confidentiality threshold for the R-DAS system and is therefore suppressed from possible analysis.

Participants were included in the current analysis if they indicated that they had injected cocaine, some other psychostimulant drug, or heroin within the 12 months prior to the interview, and we note that NSDUH did not assess the recency of injecting drugs other than those just listed. While direct estimates of sample sizes are not available in the R-DAS system, using a previously established method (Vsevolozhskaya & Anthony, 2014) we can estimate that 689 participants fit these inclusion criteria for which data was used in this study. The primary dependent variable was where the participant had obtained the last syringe used for injecting drugs (i.e., obtained via the question: “The last time you used a needle for injecting drugs, how did you get the needle?”), and whether it had come from a pharmacy, from a syringe exchange program (SEP), or from the street or ‘shooting gallery’, or some ‘other’ source (e.g., “from drug dealer/came with drugs”, “got it at a party”, etc.). It should be noted that PWID do use multiple sources to obtain syringes (Zlotorzynska et al., 2018), however our primary outcome of interest is the last used syringe. For our primary analysis, we classified pharmacies and SEP as ‘safe’ sources and all other sources as ‘potentially unsafe’, similar to the classification used in previous studies (Battles, Rowe, Ortega-Peluso, Klein, & Tesoriero, 2009; Hagan et al., 2006).

Our main analysis examined differences in percentage of acquisitions from safe sources (SEP and pharmacies) as well as specific comparisons (pharmacy, SEP, street/shooting gallery, friend, and other) across states with differing syringe sale policies for a single stacked dataset across the entire survey interval of 2002 to 2011. R-DAS provides estimated proportions and their standard errors using Taylor series linearization variance procedures. P-values for differences in percentages were derived from these standard errors. In addition, post-estimation exploratory data analysis was undertaken that stratified participants by ethnic self-identification categories in effort to explore if the association between state policy and syringe acquisition varied across these groups (i.e., rural/urban continuum as well as race and ethnic categories). Characteristics such as race/ethnicity were measured via standardized ACASI item sets. Some individual characteristics in the R-DAS datasets, such as metro/non-metro status, are geo-coded by the NSDUH research team, based on the county of the participant’s dwelling unit. Specifically, metro/non-metro status is determined by the dwelling unit’s 2003 classifications by the Department of Agriculture (Department of Agriculture, 2003).

¹For a detailed discussion of syringe sale regulations please see Bramson et al. (2015).

One potential explanation for state-level variations is that states differ in the frequency or occurrence of risky injection behaviors generally that could confound possible associations between syringe policy and acquisition. This potential extraneous source of variation can be studied in relation to the occurrence of a risky injection behavior, such as injection of cocaine (Tyndall et al., 2003), irrespective of the source of the syringe. Hence, before drawing conclusions, we inspected whether any discernible pattern in relation to state syringe sale policies could be found for cocaine injecting (i.e., the percentage of PWID who injected cocaine during the past year) and multiple reuse of syringes irrespective of source (i.e., the percentage of PWID who used the same syringe prior to their most recent injection).

Results

Table 1 displays the estimated syringe acquisition behavior and demographic characteristics, regardless of state residence. As shown, syringe acquisition from pharmacies was the most frequent source (53.0%) followed by friends (13.8%), SEPs (12.5%), and the street (11.4%). Past year injectors were also predominantly White non-Hispanic (77.5%) living in metro regions (50.7%).

As shown in Table 2, the states with unrestricted syringe sales policies had a larger proportion of PWID with the last syringe obtained from a safe source (difference, $D = 9.8\%$; 95% CI = 1.9%, 17.7%; $p < 0.001$). With respect to specific sources, PWID residing in unrestricted policy states were more likely than those residing in restrictive policy states to have obtained the last syringe at a pharmacy ($D = 20.4\%$, 95% CI = 12.2%, 28.6%), and they were less likely to have obtained it from a SEP ($D = -10.7\%$, 95% CI = -16.1%, -5.3%) or from the 'street' ($D = -6.7\%$, 95% CI = -12.7%, -0.7%). However, no significant difference was found across states for having obtained a syringe from friends ($D = 0.3\%$, 95% CI = -5.5%, 6.1%) or other sources ($D = -3.3\%$, 95% CI = -7.6%, 1.0%).

In post-estimation exploratory data analyses, we found similar patterns between restricted and unrestricted states held for most metro/non-metro regions and for ethnic self-identification categories. We note that many specific comparisons were not statistically significant at $p < 0.05$. Nonetheless, the estimates are informative about variation across states with varying policies. For example, we found that pharmacy acquisition of syringes was somewhat more common among Hispanic PWID living in unrestricted policy states versus Hispanic PWID in restrictive policy states, yielding a difference larger than was seen for all PWID ($D = 32.5\%$, CI = 5.4%, 59.6%). Alternatively, SEP syringe acquisition was somewhat more common in restricted states versus unrestricted states for Black/Multiple/Other PWID, also yielding a difference larger than what was seen for all PWID ($D = -22.7\%$, 95% CI = -42.5%, -2.9%).

Furthermore, for the confounding analysis examining non-syringe acquisition related risk behavior across states with differing policies, no significant association was found for cocaine injecting ($p = 0.742$) or with reuse of syringes ($p = 0.184$) across states with differing syringe sale policies.

Discussion

The main finding of this study is that PWID residing in states with unrestrictive policies were more likely to have obtained the last-used syringe from a safe source, as compared to PWID residing in states with greater restrictions on syringe sales. To the extent that spread of communicable diseases can be attributed to unsafe syringe sources, an unintended negative health behavior externality may arise where PWID face state or sub-state local policies that discourage syringe acquisition from pharmacies -- even when needle exchange programs have been financed to offset pharmacy restrictions.

Before discussion of this new evidence, several methodological issues should be noted. Most importantly, it is possible that unmeasured confounding variables explain the association between syringe policy and syringe acquisition behavior. However, the limited available confounding analysis performed in the current study found no evidence to suggest general risk behavior unrelated to syringe acquisition, such as cocaine injecting and reuse of syringes, varies across states with differing policies. Nonetheless, a more robust analysis would include the difference-in-differences method to assess changes in syringe acquisition across states during periods of syringe liberalization. However, this analysis was not possible given the restrictions of the R-DAS data set. In addition, we judge the NSDUH sample to be the current best approximation of a nationally representative sample of PWID, but we also must acknowledge that the most severely impaired PWID in US communities might not be found among NSDUH participants. With respect to survey coverage error, we note that PWID are unlikely to be fully captured in the current sampling frame, even though the range of dwelling units has been extended to encompass homeless community residents. With respect to unit non-response error, we must acknowledge that PWID with higher levels of socially maladaptive drug use also might be less likely to participate in the study, and might be less likely to be listed on the dwelling unit rosters. With respect to item non-response error, we note that some PWID might refuse to answer questions regarding injection drug use given stigma often attached to this behavior. We are not at all sure that these measurement errors have anything to do with the state-level syringe access policies, and we suspect that measurement errors of this type might have little or nothing to do with setting of state-level policies on this important public health topic.

It also is true that our state classifications were necessarily broad so as to eliminate between-category shifts across the calendar interval from 2002 to 2011 when some states relaxed their syringe restrictions. In consequence, in this research, we have been unable to investigate specific policies and their implications for PWID behavior. Similarly, these classifications likely introduce measurement error when equating states with extremely limited syringe restrictions (e.g., restricting the number of syringes) with states with more stringent restrictions (e.g., requiring a prescription on syringe sales). However, this error would likely bias our results towards the null given that this classification scheme is more likely to attenuate the relationship between state policy and acquisition behavior rather than strengthen it. Accordingly, a more detailed coding scheme (which is not currently possible with the existing data) would be unlikely to change the direction of the effect.

Notwithstanding limitations of this type, the current study extends prior research based largely upon geographically confined or convenience samples of PWID. We hope that new evidence presented in this study might provoke policy discussions and influence state-level or local area policies intended to increase access to syringes from safe sources such as pharmacies. These findings also concur with accumulating evidence from local or state specific research suggesting deregulation of syringe acquisition has led to increased acquisition of syringe from safe sources such as pharmacies (Cotten-Oldenburg et al., 2001; Deibert et al., 2006; Des Jarlais et al., 2002; Groseclose et al., 1995; Rich et al., 2007; Siddiqui et al., 2015). New research can be used to enhance the policy discussion and to provide additional evidence for public health-oriented policy analysis. A relatively simple extension of this line of research involves the use of 'restricted analysis' set of NSDUH data, which may permit future research teams to look into fine-grained temporal and sub-state variations in syringe acquisition policies. Similarly, intervention research at the pharmacy level may also provide additional detail on the impact of increased access of syringes and help to optimize the benefits of pharmacies as a health promotional resource for PWID (Crawford et al., 2013, 2014). Future research on syringe policy may also provide insight toward ethnic minority health disparities, and can build from this study's exploratory finding about how less restrictive syringe policies might be having a larger effect on safe practices among Hispanic heritage PWID.

This study also concurs with previous research (Jones, 2018; Zlotorzynska et al., 2018) indicating that pharmacies are the primary source of syringe acquisition among PWID in the US, substantially outnumbering the number of PWID who obtained their last syringe from a SEP. This is likely due to the ubiquity and ease of access that pharmacies provide relative to the much more limited access provided by most SEP. In fact, the higher rates of SEP utilization in states with restricted syringe access may be partially explained by the wider availability of SEPs in these regions. For example, a national directory of currently operating SEPs (North American Syringe Exchange Network, 2019) includes nearly twice as many SEP programs in states with historically restricted sale ($n = 209$) compared to those with unrestricted sale ($n = 103$).

Due to the high level of utilization of pharmacies as a source of syringe acquisition, these findings further emphasize the need for more comprehensive research on the benefits and costs of pharmacy acquisition, as opposed to other sources, and emphasize the need for continued development of collaboration with pharmacies to promote public health goals. Several studies have found differences in the behavior between PWID who use pharmacies as their primary source compared to those who primarily use SEPs. For example, PWID primarily using pharmacies may be more likely to have improperly disposed of a syringe (Quinn, Chu, Wenger, Bluthenthal, & Kral, 2014; Zlotorzynska et al., 2018), less likely to have a recent HIV test (Zlotorzynska et al., 2018), and more likely to have recently initiating injecting (Rudolph et al., 2010; Vorobjov et al., 2009; Zlotorzynska et al., 2018). Accordingly, additional research is required regarding the tradeoff of pharmacy syringe acquisition, versus SEP acquisition, given the many additional services provided by SEPs were not traditionally provided by pharmacies (e.g., injection hygiene interventions, overdose prevention and response training, etc.; Janulis, 2012) but are increasingly being

offered at as part of the services available in pharmacies (Hammett et al., 2014; Lewis, Rivera, Crawford, DeCuir, & Amesty, 2015; Myers, Farhat, Guzman, & Arya, 2019).

Furthermore, reduction of policy restrictions alone may have limited impact on the behavior of PWID given that pharmacy staff often have discretion over syringe sale even when policy explicitly approves of this behavior (Chiarello, 2016; Ibragimov et al., 2019; Meyerson et al., 2018; Pollini et al., 2014; Reich et al., 2002) and because PWID may be unaware or skeptical of pharmacy syringe sale due to historical limitations of syringe access in the past. Accordingly, interventions to promote pharmacy staff buy-in of syringe sale and support among PWID for pharmacy syringe acquisition will remain important aspect of expanding access to sterile syringes in addition to changes in public policy, particularly in regions that have historically limited pharmacy syringe sale in the past.

Finally, we also note that landscape of injection drug use in the US has substantially changed since the period of time represented in this study due to the impact of the opioid epidemic on heroin and prescription opioid injecting practices (Zibbell et al., 2018). Importantly, many states continue to place restrictions on the sale of syringes (Burris, 2019) despite the growing concern regarding injection drug use, HIV, and HCV related to this epidemic. Accordingly, additional research on these topics is urgently needed to understand how shifting trends in drug use behavior may impact syringe acquisition behavior and to inform policy discussions on countering the spread of disease among this new generation of PWID. This research may be particularly important in nonurban regions where SEPs are largely unavailable and fewer studies exist of PWID, despite the growing concern regarding injection drug use in these areas (Paquette & Pollini, 2018; Schranz, Barrett, Hurt, Malvestutto, & Miller, 2018).

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Table 1.

Estimated Source of Last Used Syringe and Demographic Characteristics

Variable	Past Year Injectors		All NSDUH ^b	
	% (SE)	95 % Confidence Interval for estimated Percent	% (SE)	
Syringe Source				
Pharmacy	53.0 (2.32)	48.4	57.5	-
SEP	12.5 (1.70)	9.5	16.3	-
Street ^a	11.4 (1.65)	8.5	15.0	-
Friend	13.8 (1.54)	11.1	17.1	-
Other	9.28 (1.22)	7.1	12.0	-
Race				
White, Non-Hispanic	77.3 (2.23)	72.6	81.4	68.3 (0.18)
Black, Multiple, Other, Non-Hispanic	10.3 (1.58)	7.6	13.8	18.0 (0.15)
Hispanic	12.4 (1.90)	9.1	16.7	13.7 (0.13)
Rural/Urban Continuum				
Metro	50.7 (2.43)	46.0	55.6	54.4 (0.21)
Small Metro	28.5 (2.23)	24.4	33.2	30.0 (0.21)
Non-Metro	20.8 (1.78)	17.3	24.3	16.6 (0.17)

^aStreet also includes syringes obtained from a shooting gallery.

^bThis represents the 2002-2011 NSDUH general population estimates and were calculated using the currently available version of R-DAS system

Table 2.

Source of last used syringe by Unrestricted versus Restricted Syringe Sale

	Source of Syringe	Estimated percentage of last syringes in states with unrestricted ^a retail Sale % (SE)	Estimated percentage of last syringes in states with restricted retail sale % (SE)	Estimated difference between unrestricted and restricted states ^b % (SE)	95% Confidence intervals for estimated difference in percentage	
All	Safe Source ^d	71.9 (2.8)	62.1 (2.9)	9.8 (4.0) [*]	1.9	17.7
	Pharmacy	66.3 (2.3)	45.9 (3.2)	20.4 (4.2) [*]	12.2	28.6
	SEP	5.6 (1.3)	16.3 (2.5)	-10.7 (2.8) [*]	-16.1	-5.3
	Street ^c	7.0 (2.0)	13.7 (2.5)	-6.7 (3.0) [*]	-12.7	-0.7
	Friend	14.0 (2.1)	13.7 (2.1)	0.3 (3.0)	-5.5	6.1
	Other	7.1 (1.4)	10.4 (1.7)	-3.3 (2.2)	-7.6	1.0
White, Non-Hispanic	Safe Source	71.8 (3.1)	63.1 (3.1)	8.7 (4.4) [*]	0.1	17.3
	Pharmacy	67.9 (3.2)	51.5 (3.4)	16.4 (4.6) [*]	7.3	25.5
	SEP	3.9 (3.4)	11.7 (2.0)	-7.8 (3.9) [*]	-15.5	-0.1
	Street	6.7 (2.3)	9.7 (1.5)	-3.0 (2.8)	-8.4	2.4
	Friend	13.7 (2.1)	15.9 (2.6)	-2.2 (3.4)	-8.8	4.4
	Other	7.8 (1.6)	11.3 (2.1)	-3.5 (2.7)	-8.8	1.8
Black, Multiple, Other, Non-Hispanic	Safe Source	65.5 (11.6)	63.2 (9.0)	2.3 (14.7)	-26.6	31.2
	Pharmacy	54.7 (12.2)	29.7 (8.3)	25.0 (14.8)	-3.9	53.9
	SEP	10.9 (4.9)	33.6 (8.9)	-22.7 (10.1) [*]	-42.5	-2.9
	Street	6.9 (4.1)	15.8 (5.7)	-8.9 (7.1)	-22.7	4.9
	Friend	23.6 (11.3)	7.6 (5.2)	-16.0 (12.4)	-8.4	40.4
	Other	3.9 (1.6)	13.3 (6.0)	-9.4 (6.3)	-21.7	2.9
Hispanic	Safe Source	78.1 (8.0)	55.7 (12.0)	22.4 (14.4)	-5.8	50.6
	Pharmacy	61.9 (9.8)	29.4 (9.8)	32.5 (13.8) [*]	5.4	59.6
	SEP	16.2 (7.5)	26.3 (11.2)	-10.1 (13.5)	-36.5	16.3
	Street	8.8 (5.4)	33.6 (11.9)	-24.8 (13.1)	-50.5	0.9
	Friend	8.9 (5.8)	7.2 (3.7)	1.7 (6.9)	-11.8	15.2
	Other	4.2 (3.2)	3.5 (2.3)	0.7 (4.0)	-7.1	8.5
Metro	Safe Source	72.0 (4.9)	62.4 (3.8)	9.6 (6.2)	-2.6	21.8
	Pharmacy	66.1 (5.1)	42.4 (4.2)	23.7 (6.6) [*]	10.7	36.7
	SEP	5.9 (1.95)	20.0 (3.4)	-14.1 (3.9) [*]	-21.8	-6.4
	Street	5.6 (2.3)	15.2 (3.2)	-9.6 (4.0) [*]	-17.3	-1.9
	Friend	15.2 (4.4)	13.4 (2.0)	1.8 (5.3)	-8.5	12.1
	Other	7.2 (2.7)	9.0 (2.1)	-1.8 (3.4)	-8.5	4.9
Small Metro	Safe Source	69.6 (5.6)	61.1 (5.8)	8.5 (8.1)	-7.3	24.3
	Pharmacy	59.9 (5.2)	54.6 (5.9)	5.3 (7.9)	-10.1	20.7
	SEP	9.6 (3.2)	6.5 (2.2)	3.1 (3.8)	-4.4	10.6

	Source of Syringe	Estimated percentage of last syringes in states with unrestricted ^a retail Sale % (SE)	Estimated percentage of last syringes in states with restricted retail sale % (SE)	Estimated difference between unrestricted and restricted states ^b % (SE)	95% Confidence intervals for estimated difference in percentage	
Non Metro	Street	10.7 (5.0)	10.9 (4.4)	-0.2 (6.7)	-13.3	12.9
	Friend	14.5 (3.8)	15.9 (4.1)	-1.4 (5.6)	-12.4	9.6
	Other	5.2 (1.8)	12.1 (3.6)	-6.9 (4.0)	-14.8	1.0
	Safe Source	74.2 (4.1)	62.7 (6.9)	11.5 (8.0)	-4.1	27.1
	Pharmacy	72.8 (4.1)	44.9 (7.5)	27.9 (8.5) [*]	11.2	44.6
	SEP	1.4 (0.5)	17.8 (7.7)	-16.4 (7.7) [*]	-31.5	-1.3
	Street	4.4 (1.3)	12.4 (3.9)	-8.0 (4.1)	-16.0	0.0
	Friend	12.4 (2.8)	10.9 (4.0)	1.5 (4.8)	-8.0	11.0
	Other	9.0 (2.7)	14.0 (4.8)	-5.0 (5.5)	-15.8	5.8
	Cocaine Injecting	61.5 (4.2)	63.4 (4.0)	-1.9 (5.8)	-13.2	9.4
	Multiple use of syringe	52.0 (3.2)	58.0 (3.2)	-6.0 (4.5)	-8.6	2.9

^a States with unrestricted syringe sale: AL, AK, AR, AZ, CO, IA, ID, KS, MI, MO, MS, MT, NC, ND, NE, NM, OK, OR, SD, TX, UT, VT, WI, WV, WY; States with restricted syringe sale: CA, CT, DC, DE, FL, GA, HI, IL, IN, KY, LA, MA, MD, ME, MN, NH, NJ, NV, NY, OH, PA, RI, SC, TN, VA, WA

^b Positive values indicate a higher percentage in states with unrestricted syringe sale and negative values indicate higher percentage in states with restricted syringe sale.

^c Street also includes syringes obtained from a shooting gallery.

^d Syringes were considered from a safe source if they were obtained from a pharmacy or a SEP.

^{*} Indicate difference in the percentage had a p-value < .05