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▶ [A comparison of syringe disposal practices among injection drug users in a city with versus a city without needle and syringe programs.](#)

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Drug and Alcohol Dependence: 2012, 123(1–3), p. 255–299.

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A major concern about needle exchanges is that after use the injecting equipment they supply will be left unsafely disfiguring public areas, but this US study based on a comparison between San Francisco (has legal exchanges) and Miami (exchanges illegal) strongly suggests the opposite.

SUMMARY Needle and syringe exchange programmes, which allow injecting drug users to safely dispose of used injecting equipment and receive new sterile equipment, were first established in some parts of the USA in the late 1980s, and have since 2009 been eligible for federal funding. Access to needle and syringe programmes in the USA still varies greatly: in San Francisco there are four dedicated needle and syringe programmes, and pharmacies are also able to provide up to 10 syringes without a prescription; whilst in Miami there are no needle exchanges because they are illegal, as is giving or selling syringes to people who are known to inject drugs. Researchers exploited the policy differences between these cities to test whether needle exchanges help reduce the number of used needles and syringes discarded unsafely in public places.

Unsafely discarded needles and syringes present a risk, albeit slight, to the public from blood-borne diseases including HIV and hepatitis. At issue was whether exchanges reduce unsafely discarded needles and syringes by providing a safe disposal site and a motivation – receiving sterile new equipment – to use it. Concerns have been expressed that exchanges might instead increase the number of discarded syringes; the featured study is the first to address this by comparing rates of discarded syringes in cities with and without exchanges.

Data for San Francisco derived from [a 2008 study](#) into syringe disposal and for Miami from new research conducted in 2009 using similar methods – a visual inspection of drug-affected areas for discarded syringes, and interviewing injectors to ask how they had discarded their syringes. Visual inspections involved determining which neighbourhoods in each city were assessed as being in the top quartile of drug-affected areas, as indicated in San Francisco by the number of drug-related arrests and drug treatment admissions, and in Miami by the number of drug-related arrests. The neighbourhoods were [divided](#) into blocks, and a random sample of blocks picked to be surveyed. The blocks were then inspected visually for discarded syringes, looking in all publically accessible areas including pavements, gutters, grassy areas, alleyways and car parks. In San Francisco, one side of each block was examined; in Miami, all four sides were. The number of syringes found in San Francisco was multiplied by four to compensate, and researchers used census data to calculate in each city the number of syringes found per 1000 residents of the blocks.

Just over 600 injecting drug users in San Francisco and just under 450 in Miami were interviewed about how they disposed of syringes. The sampling methods were [slightly different](#), but have been shown to produce similar results, and researchers did not deliberately recruit from needle exchanges. Interviewees over 18 who had recently injected were asked if and how many times they had disposed of syringes in the last 30 days by discarding them in public places, giving away or selling, or by placing them in rubbish bins ('unsafe' disposal), versus at exchanges, hospital clinics, pharmacies, or in sharps containers ('safe' disposal). Most interviewees were homeless men over 40. San Francisco had relatively more non-Hispanic white respondents and Miami more Hispanics, and 15% in San Francisco and 10% in Miami reported being HIV positive.

Main findings

In San Francisco 11 discarded syringes were found, 328 in Miami. After adjusting for different sampling strategies, this equated to 44 syringes per 1000 blocks and 0.3 per 1000 people in San Francisco, compared to 371 per 1000 blocks and 4.9 per 1000 people in Miami.

In San Francisco 11% of interviewees reported having discarded any syringes in public places in the previous 30 days, compared to 69% in Miami, and the difference was statistically significant. 65% of interviewees in San Francisco reported any improper or unsafe disposal in the previous 30 days, compared to 95% in Miami. Apart from in public places, the unsafe disposal was mostly putting syringes in the rubbish (53% of interviewees in San Francisco, 66% in Miami) flushing them down the toilet (15% in San Francisco, 2% in Miami) and giving them away or selling them (13% in San Francisco, 13% in Miami). The primary safe methods of disposal reported were discarding syringes at a needle exchange (62% of interviewees in San Francisco, 0% in Miami) or at a hospital or clinic (12% in San Francisco, 2% in Miami). In Miami, none of the safe methods of disposal had been used by a sizeable proportion of interviewees in the previous 30 days.

Looking at the total number of syringes disposed of, in San Francisco 8474 out of 64259 syringes (13%) were reported disposed of unsafely, of which 718 (1%) were discarded in a public place. In Miami, 9845 out of 10379 (95%) syringes were reported disposed of unsafely, of which 4689 (45%) were in a public place. In San Francisco, 53143 (80%) syringes were reported to have been handed in at needle exchanges, compared to none in Miami. Statistical analysis showed that injecting drug users in Miami were on average 34 times more likely to discard syringes in public places than those in San Francisco. On average, homeless people in both cities were five times more likely to discard syringes in public places than non-homeless people.

The authors' conclusions

The higher number of syringes found by inspections in Miami compared to San Francisco was corroborated by the interview data, which shows that injectors in Miami were much more likely to discard syringes in public places. Free syringes are relatively abundant in San Francisco compared to Miami, which might suggest that San Franciscan injectors possess more and therefore dispose of more syringes over a given period of time, but the majority are disposed of at needle exchanges. Exchanges are a significant means of collecting used syringes, and do not increase the amount of publically disposed syringes. From the interview results, it is clear that Miami has few options for safe disposal of syringes; the great majority are discarded in public or in the rubbish, which is a risk to refuse workers and the general public. Some public areas in Miami had large numbers of discarded syringes, with four areas having over 10 syringes. Venues where syringes can be disposed of safely, such as needle exchanges, are needed in these areas, along with education and awareness-raising.

Acknowledged limitations include the year's gap between the inspections and the interviews in San Francisco and those in Miami. It is also possible that there were differences between the interviewees in the two cities that were not controlled for, which would introduce a risk of bias. Street cleaning and litter removal policies were similar in both cities, and the inspections were made at random times, so it is likely that the number of syringes spotted in each city was representative. Because the inspections were only conducted in a small proportion of city blocks, in areas considered to be the most drug-affected, the results cannot be generalised to areas that are not so drug-affected. The interviews rely on self-reporting of syringe disposal, which might be subject to bias. The sampling methods used to pick people for interviews were also different, although should not have produced very different results.

FINDINGS COMMENTARY The results appear compelling insofar as they apply to the discarding of syringes in public places; they show that many more syringes were found discarded in public places in Miami than in San Francisco, in total, per person and per block, and that a much greater percentage of injectors reported publically disposing of a much greater number of syringes in Miami than San Francisco. Looking not just at public places, but all unsafe disposal including in the rubbish, we find that there is much less difference in the total number of syringes reported disposed unsafely; approximately 8500 from 600 injectors in San Francisco, and approximately 9800 from 450 injectors in Miami. This appears to be a less strongly positive result, but we should bear in mind that the primary aim of needle exchanges, reducing the re-use of contaminated needles and syringes and resulting blood-borne virus transmission among injectors, may work in the other direction by increasing the supply of syringes. To reduce virus transmission in injectors, it is of course desirable to provide sufficient needles and syringes so that injectors have a new one each time they inject. If the aim were only to reduce the number of syringes disposed of unsafely, it would be acceptable simply to reduce the supply of syringes, or insist on one-to-one return. Perhaps the most important finding of this study is that despite there being much greater numbers of syringes disposed of in San Francisco – a positive outcome with regard to virus transmission, assuming that the number of injections was similar – the exchanges collected so many used syringes that the number of syringes disposed of unsafely was still lower than in Miami, and of those disposed of unsafely, many fewer were in public places.

Whilst this appears to be a very positive result, we cannot securely attribute all of the differences in syringe disposal to the presence of exchanges; whilst the researchers took into account differences in sex, age and other demographic characteristics among the injectors interviewed, other differences between the cities may not have been taken into account. The concern about the limitations of self-reported interview data is also legitimate; it is possible for example that injectors in San Francisco were reluctant to admit to disposing of syringes in public places when they knew that there were exchanges available, whereas in Miami, with fewer alternatives, this might not apply. There should be concerns about the validity of comparing data that was in many ways conducted differently in each city; the Miami study counted all four sides of each block not just one, used different measures to assess which were the most drug-affected areas, and used different sampling methods to select people for interviews. Importantly for the inspection data, we have no way of knowing if the areas inspected in San Francisco and Miami had similar levels or types of drug use. They were, by slightly different measures, each in the top quartile of drug-affected areas for each city, but this may conceal many differences including but not limited to the concentration of drug users in the areas, which drugs were being used and what proportion were injected, as well as other legal or policing differences between the cities. If for example, injecting in Miami was concentrated in a few particular areas but more dispersed in San Francisco, counting syringes found in only the most affected areas might unfairly make Miami look worse even if the total amount of syringes city-wide would have been similar. In particular in Miami, the syringes that the researchers found were very bunched, with large numbers found in just a few blocks, but none in most blocks. This means that the accuracy of the selection of areas deemed to be most drug-affected was critical to the results of this part of the research.

It is not clear why the researchers did not attempt to conduct the study in Miami using identical methods to the one in San Francisco, but clearly any further research on the subject ought to assess different cities or regions at the same times and using identical methods. It would also have been helpful to obtain data directly from the needle exchanges in San Francisco, to see whether the differences they observe between the numbers of syringes distributed and collected corroborates the findings from the interviews.

The negative impact of discarded syringes is not limited just to possible health risks to the community, but can also be upsetting, diminishing the quality of the environment. In the UK, **it is not even known** how many needles and syringes are distributed, even less the number that are discarded, making it difficult to assess the true extent of this problem. The response of the community to discarded syringes, and the negative impression formed of injecting drug users, can also lead to the closure of needle exchanges. This is just what happened in **one Canadian city**. In this case and perhaps ironically, the closure of the needle exchange actually led to an increase in drug-related nuisance nearby.

Needle exchanges are legal throughout the UK, and the National Treatment Agency for Substance Misuse (now absorbed into Public Health England) **was confident** that there is effective needle exchange provision in every local area in England. **Guidance** from the National Institute for Health and Clinical Excellence recommends that local areas provide a range of services, and that all programmes should as a minimum: encourage people who inject drugs to use the services on offer, provide as many needles and syringes and other injecting equipment as someone needs, provide sharps bins and advice on how to dispose of equipment safely, provide advice on safer injecting and ways to get help to stop using drugs or switch to non-injecting methods. More specialist services should include advice and services to help them stop injecting and treatment of infections and other health problems, vaccinations and housing and benefits advice (or help to access to such services). It has also **recently been made legal** for needle exchanges to provide foil as well as injecting paraphernalia, to encourage injectors to move toward smoking drugs on foil as a far less harmful route of administration. For more analyses of the research basis around needle exchange, try **this Findings search**, or **this search** for research specific to needle exchanges, public nuisance and litter.

Thanks for their comments on this entry in draft to Jamie Bridge of the National Needle Exchange Forum. Commentators bear no responsibility for the text including the interpretations and any remaining errors.

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