


DRUG & ALCOHOL FINDINGS *Research analysis*

This entry is our analysis of a study considered particularly relevant to improving outcomes from drug or alcohol interventions in the UK. The original study was not published by Findings; click [Title](#) to order a copy. Free reprints may be available from the authors – click [prepared e-mail](#). The summary conveys the findings and views expressed in the study. Below is a commentary from Drug and Alcohol Findings.

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► Using interrupted time series analysis to measure the impact of legalized syringe exchange on HIV diagnoses in Baltimore and Philadelphia.

Ruiz M.S., O'Rourke A., Allen S.T. et al.

JAIDS Journal of Acquired Immune Deficiency Syndromes: 2019, 82, p. 148–154.

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Strong evidence from two US cities that moving from a blanket prohibition on possession of equipment for injecting illegal drugs to providing this equipment via legal needle and syringe programmes prevented thousands of HIV infections, resulting in large savings in the treatment of these infections.

SUMMARY The featured study examined how the implementation of needle and syringe programmes in two US cities (Philadelphia and Baltimore) impacted the HIV epidemic, and attempted to isolate the specific impact of policy changes on the numbers of new HIV diagnoses. Needle and syringe programmes are the primary intervention for reducing injecting-related transmission of hepatitis C and other blood-borne viruses, and work by providing people who inject drugs with sterile needles, syringes, other injecting equipment, and infection-prevention and support services.

Philadelphia. In Philadelphia needle and syringe programmes first started when activists [organised](#) a community response to rising HIV infection rates among people who inject drugs. At the time, Pennsylvania's paraphernalia laws were conflicting: syringe possession and distribution were [illegal](#) in Philadelphia, but the Disease Prevention and Control Act of 1955 authorised syringe distribution as a disease prevention activity within individual cities. In late 1991, a needle and syringe programme called [Prevention Point Philadelphia](#) was [created](#), operating [illegally](#) despite having support from the health commissioner, officials at the Department of Health, and the mayor. In 1992, the mayor signed an [executive order](#) declaring HIV/AIDS a public health emergency and authorising the use of needle and syringe programmes in Philadelphia to address it. At the time of publication, Prevention Point Philadelphia remained the only officially recognised needle and syringe programme in Philadelphia, [providing](#) syringe access and harm reduction services (including medical care, wound care, HIV/hepatitis C testing, overdose prevention and overdose reversal training, linkage to drug treatment, and medication-assisted treatment) through municipal and private support.

Baltimore. The legislative environment in Baltimore was also the biggest obstacle to the implementation of needle and syringe programmes: Maryland's Uniform Controlled Dangerous Substances Act of 1970 made drug paraphernalia possession illegal. The impetus for change came in 1992 from the city's own leadership (the mayor and the health commissioner), who lobbied the state legislature for exemptions to paraphernalia laws for Baltimore City so the health department could legally distribute sterile injecting equipment. Early attempts at policy change were met with resistance from the Governor and other state legislators, but the law was eventually [changed](#) in 1994. [Since then](#), the Baltimore City Health Department has run the needle and syringe programme, which has also facilitated harm reduction education, linkage to addiction treatment services (including maintaining same-day treatment openings), testing and counselling for HIV and syphilis, and opioid overdose response training.

For each city, researchers forecast the annual number of new injecting-related HIV diagnoses expected to occur in the next 10 years had policies not changed. These figures were then compared with observed numbers of diagnoses to calculate the number of averted diagnoses of HIV that could be attributed to legal needle and syringe programmes.

Data was divided into two periods: (1) before the policy change ('pre-implementation'); and (2) after the policy change ('post-implementation'). For the purpose of analysis, the post-implementation period commenced six months to a year after the policy change as, in these initial months, diagnoses were expected to rise after people living with HIV and previously undiagnosed were detected due to more effective surveillance efforts and testing mechanisms (including the needle and syringe programmes acting as an entry point to diagnosis). In Philadelphia, legal needle and syringe exchange began on 1 August 1992; the pre-implementation period was 1984–1992 and the post-implementation period was 1993–2015. Baltimore's programme began on 1 June 1994; the pre-implementation period was 1985–1994 and the post-implementation period was 1995–2013.

In Philadelphia, information on all HIV/AIDS diagnoses (including HIV transmission risk) reported to the Philadelphia Department of Public Health AIDS Activities Coordinating Surveillance Unit was available from 1984, giving figures for HIV diagnoses among people who inject drugs, and HIV diagnoses among men who have sex with men *and*



Key points From summary and commentary

The featured study examined the impact of policy changes to allow needle and syringe programmes in two US cities, using as its key measure the number of new injecting-related HIV diagnoses before and after the programmes were introduced.

An estimated 10,592 HIV diagnoses were averted in Philadelphia over a 10-year period, and 1,891 HIV diagnoses were averted in Baltimore over a similar time span. Considering programme expenses and conservative estimates of public sector savings, the one-year return on investment in needle and syringe programmes was high (\$243.4m and \$62.4m respectively).

This provides additional support for the effectiveness of policy change as a structural intervention for HIV prevention among people who inject drugs, and the utility of syringe access as an effective, evidence-based approach to promote the health of people who inject drugs.

inject drugs. In Baltimore, annual percentages of diagnoses attributed to each exposure category were reported for the years 1985–2013, giving figures for HIV diagnoses among people who inject drugs with no other exposure, HIV diagnoses among men who have sex with men, and HIV diagnoses among men who have sex with men *and* inject drugs. From these figures in Baltimore, the total number of injecting-related HIV diagnoses was calculated.

Main findings

Philadelphia

In Philadelphia there was a statistically non-significant decrease in the average annual number of new injecting-related HIV diagnoses (from 420 before implementation to 292 after), and a significant decrease in the group at risk of exposure from injecting drug use *and* sexual behaviour (78 and 36 respectively).

It was forecast that there would be 15,248 new injecting-related HIV diagnoses in Philadelphia between 1993 and 2002. In total, 4,656 diagnoses were actually reported, equating to 10,592 averted diagnoses of HIV over 10 years (or roughly 1,059 diagnoses annually).

Compared with the underlying expected trend, there was a significant immediate reduction in HIV diagnoses after the policy change, and a significant sustained decrease in HIV diagnoses. The year needle and syringe programmes were allowed and implemented coincided with HIV diagnoses peaking, which made it all the more striking that the implementation of the intervention had a statistically significant impact based on this analysis of injecting-related HIV diagnoses between 1984 and 2015.

Baltimore

In Baltimore there was a significant pre-to-post intervention decrease in both the average number of injecting-related HIV diagnoses (down from 608 to 357) and the average numbers of new diagnoses attributed to each exposure category (injecting drug use only, down from 543 to 332; men who have sex with men and inject drugs, down from 65 to 25). In contrast, there was only a small difference between the expected (1,776) and observed (1,345) cases of HIV attributed to men who have sex with men without exposure via injecting drug use.

The 10-year forecast predicted 7,263 new injecting-related HIV diagnoses in Baltimore between 1995 and 2004. A total of 5,372 diagnoses were actually reported, indicating that 1,891 diagnoses were averted – 207 cases in the first five years and 1,684 in years 6–10.

Compared with the underlying expected trend, there was no significant immediate reduction in HIV diagnoses, nor a significant sustained decrease in HIV diagnoses, suggesting that injecting-related HIV diagnoses had begun to stabilise and decrease slightly before needle exchange implementation. However, as there was a significant pre-to-post intervention decrease in the average number of injecting-related HIV diagnoses, the addition of needle and syringe programmes may have contributed to a more rapid decline.

Using the same method of analysis for HIV diagnoses attributed to men who have sex with men, there was no significant immediate reduction or significant sustained decrease in HIV diagnoses. Added to this the smaller proportion of HIV cases averted after the implementation of the needle and syringe programme among this group, and it seems that although other factors occurring within Baltimore probably played some role in the decrease in HIV seen among people who inject drugs, the decrease can predominantly be attributed to the introduction of the needle and syringe programme.

Cost savings

Averting HIV diagnoses translated to cost savings for two cities where most people living with HIV were recipients of publicly-funded healthcare. The forecasts estimated an average of 1,059 HIV diagnoses averted annually in Philadelphia and 189 HIV diagnoses averted annually in Baltimore. Multiplying the [lifetime costs](#) of HIV treatment per person (\$229,800) by the average number of diagnoses averted annually in both cities yielded an estimated annual saving of \$243.4m for Philadelphia and \$62.4m for Baltimore. Considering diagnoses averted over the 10-year periods, the lifetime cost savings associated with averted HIV diagnoses attributed to policies facilitating needle and syringe programmes may be more than \$2.4 billion and \$624 million for Philadelphia and Baltimore respectively.

As needle and syringe programmes are [relatively inexpensive](#) to operate, overall cost savings remain substantial even when deducting operational costs from the total amount. Considering annual programme expenses (\$390,000 in 2011 for [Philadelphia](#) and \$800,000 in the financial year 2017–2018 for [Baltimore](#)) and the cost savings in each city, plus a conservative estimate that 75% of these savings would be experienced in the public sector, the one-year return on investment in needle and syringe programmes remained in the hundreds and tens of millions of dollars (\$182.5m for Philadelphia, \$46.8m for Baltimore).

The authors' conclusions

Research into the impact of new needle and syringe programmes in Philadelphia and Baltimore provided additional support for the effectiveness of policy change as a structural intervention for HIV prevention among people who inject drugs, and the utility of syringe access as an effective, evidence-based approach to promote the health of people who inject drugs.

Further analyses revealed that small investments in needle and syringe programmes may yield large savings in HIV treatment costs, and therefore may liberate resources for other important interventions, such as expanded access to medication-assisted treatment, overdose prevention, and housing.

Variations in the implementation of needle and syringe programmes may influence their effectiveness. Policies governing needle and syringe programmes affect not only the overall number of syringes distributed annually but also the ability of people who inject drugs to obtain sufficient coverage for all injection events (including the possibility that they may pass on injecting equipment to their peers).

In Philadelphia, there is evidence that annual syringe distribution has [consistently increased](#) from approximately 811,000 in 1999 to 1.2 million in 2014, allowing for more opportunities for disease prevention among people injecting. By contrast, Baltimore's needle and syringe programme had a 1:1 exchange policy (swapping one used needle/syringe for one new needle/syringe) from 1994 to 1999, but in 2000 switched to

a more restrictive policy where clients were allowed 1:1 exchange for programme-distributed syringes but only one sterile syringe in exchange for two non-programme-distributed syringes. From 2005 to 2014, the needle and syringe programmes returned to the less restrictive 1:1 policy, after which they shifted to a needs-based distribution model whereby people who were injecting drugs could access as many syringes as needed. Baltimore City's health commissioner [estimated that](#) moving from a 1:1 to a needs-based distribution policy could increase coverage of injection events from 42% to 61%.

However, the study was subject to some limitations on its ability to identify the impact of needle and syringe programme provision. The study used HIV diagnoses, rather than the numbers infected by HIV (the 'incidence'). Whether diagnoses are a good proxy for incidence depends on various factors, including the extent of the local HIV epidemic, the number of people living with HIV unaware of their status, and the availability of local testing programmes. The study also used data from city health departments, which may underestimate the impact of needle and syringe programmes due to inconsistencies in the reporting of cases of HIV/AIDS and variability in the HIV testing patterns of people who inject drugs. Other factors making it difficult to determine the impact of policy change on the injecting-related HIV epidemic include the lack of precise estimates of the number of people who inject drugs, the overlap between groups at risk of exposure (eg, people who inject drugs and men who have sex with men), and the availability of other interventions for people who inject drugs.

FINDINGS COMMENTARY In the UK, where [harm reduction](#) services have been increasingly marginalised within the dominant policy discourse of 'full recovery', it is important to continue showing the effectiveness and cost-effectiveness of existing harm reduction services (such as needle and syringe programmes), as well as investigating the evidence base for shifting into new intervention territories (such as [drug consumption rooms](#)) where harms prevail for vulnerable groups of people who inject drugs.

In Philadelphia and Baltimore, two cities that were struggling to combat HIV, needle and syringe programmes implemented in 1992 and 1994 (respectively) had a demonstrable impact, producing public sector savings and empowering people who inject drugs to take steps to protect their own health. Thousands of cases of HIV were averted over the subsequent 10 years, which the featured study strongly suggested could be pinned down to a reduction in injecting-related risk through access to needle and syringe programmes.

In [another study](#) the same group of researchers interviewed 29 key stakeholders in three US cities (Baltimore and Philadelphia as above, plus Washington DC), asking them about the historical, social, political, and scientific context during the policy change process. For Baltimore and Philadelphia, research evidence played a consistent role in driving policy change. In contrast, it played only a minor role in Washington DC, where some policymakers were unwilling to consider its relevance. A recurring theme in all three cities was the idea of 'data free zones', defined by the presence of people opposed to needle and syringe programmes claiming they were detrimental to society, but with no empirical evidence to support this. Study participants (who were primarily supporters of needle and syringe programmes) interpreted the arguments of opponents as being rooted in fears that needle and syringe programmes would increase drug use and undermine the 'War on Drugs'.

The UK's health advisory body [recommends](#) high-coverage (and if need be, 24-hour) needle exchange to combat HIV and hepatitis C. The aim they say is for every injector to have more sterile injecting equipment than they need for every single injection – making *coverage* (getting sufficient sterile equipment) rather than *attendance* (requiring injectors to collect equipment themselves) the priority. For this reason it is considered acceptable for services to knowingly provide equipment for service users to pass on to others ('secondary distribution'), though peers of service users should be encouraged to visit needle and syringe programmes too.

Coverage (getting sufficient sterile equipment) rather than attendance (requiring injectors to collect equipment themselves) is the priority

The [2019 report](#) from Public Health England on HIV in the United Kingdom found that, although the prevalence of the virus remains low, "needle and syringe provision (NSP) in the UK is suboptimal and varies by geography". In [Scotland](#) in 2017, the proportion of people who had injected in the past six months reporting adequate provision was 80% – 'adequate' provision was considered reached when the number of needles received met or exceeded the number of times the individual injected. In [England, Wales and Northern Ireland](#) in 2018, around 3 in 5 (63%) people who had injected in the preceding 28 days reported adequate provision.

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STUDY 2019 [Evaluating the cost-effectiveness of existing needle and syringe programmes in preventing hepatitis C transmission in people who inject drugs](#)

STUDY 2008 ["I inject less as I have easier access to pipes": injecting, and sharing of crack-smoking materials, decline as safer crack-smoking resources are distributed](#)

MATRIX CELL 2017 [Drug Matrix cell A1: Interventions; Reducing harm](#)

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REVIEW 2017 [An evidence review of the outcomes that can be expected of drug misuse treatment in England](#)