

# The Role of Epidemiology in Needle Exchange Programs

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With regard to HIV policy, epidemiology has played an important role in the development of needle exchange programs. Early studies showed that injection drug users were an important risk group for HIV (and other blood-borne) infection, that multiple reuse of contaminated syringes was the primary mode of transmission between injection drug users, that injection drug users were an important source of infection to heterosexual women and children, and that a primary reason for the multiple reuse of syringes was the lack of legal access to sterile syringes due to syringe prescription and paraphernalia possession laws.<sup>1-4</sup> Those working to control HIV trans-

mission must consider the problem of multiple reuse of syringes; as part of a comprehensive strategy, access to sterile syringes is an important element in addressing the segment of users who cannot or will not stop injection drug use.<sup>5</sup>

Given the “zero tolerance” policies for illicit drug use that were prevalent when needle exchange programs were introduced in the United States in the 1980s, the concept of providing sterile syringes to injection drug users was clearly inconsistent. Policymakers at various levels raised concerns about needle exchange programs, and these concerns became research questions for epidemiologists. Appropriation bills in the US Congress included

language that banned funding of needle exchange programs until the surgeon general or the secretary of health and human services could conclude that such programs did not increase drug use and reduced HIV. Initially, the US Public Health Service banned the use of federal funds for research to address these questions, but HIV researchers, most of them working with small programs that had developed privately and with limited foundation funding, began to address these concerns independently. Ironically, despite the early ban on research (which was later lifted), policymakers made calls for review of the privately obtained data. Clearly, early data were limited by these

restrictions, and concerns about the adequacy of these data continue to be expressed.

Policymakers and researchers were concerned about whether needle exchange programs would increase injection drug use among attendees, encourage noninjectors to initiate injection, encourage former injection drug users to relapse to injection drug use, produce an increase in the number of discarded needles on the street, increase crime, and send a message to youth that the presence of these programs condones illicit drug use. As summarized in a series of government-sponsored reports and subsequent studies, the preponderance and the patterns of available evidence have weighed against these concerns.<sup>1-4,6,7</sup> A recent study showed that the closing of a needle exchange program was associated with relapse to higher-risk drug practices among injection drug users who had used the program.<sup>8</sup>

At another level, the question of whether needle exchange reduces HIV incidence was posed. Because determining the rate of incidence requires longitudinal studies of sufficient magnitude to demonstrate change, data on this question have been sparse. A large international study of serial cross-sectional data suggested that the impact of needle exchange programs was considerable.<sup>9</sup> Two studies have been published that show lower HIV incidence associated with needle exchange use in the United States.<sup>10,11</sup> In contrast, 2 Canadian studies show that injection drug users attending needle exchange programs had higher rates of HIV infection.<sup>12,13</sup>

Although inconsistency among studies' findings makes inferences cloudy (a problem not limited to research on needle exchange programs), it is important to bear in mind the different contexts of these studies. In the United States, the studies compared program attendees with injection drug users without legal access to sterile syringes, while the Canadian studies compared program attendees with injection drug users who had an alternative source of sterile needles through legal access at pharmacies. Therefore, needle exchanges in Canada represented a subset of users who tend to be more marginalized within the drug use subculture and whose alternatives for sterile syringes are thus more limited. This would serve to widen the disparities between needle exchange program attendees and nonattendees in Canada, thereby potentially masking any protective effect of needle exchange programs.

A recent study from France comparing different venues for access to sterile syringes provided evidence of the pharmacist's discretion to sell syringes or not based on the appearance of the customer. The study showed that injection drug users obtaining syringes from pharmacies were more socially integrated than those who attended needle exchange pro-

grams.<sup>14</sup> A study of the Baltimore needle exchange program, which includes both mobile vans and a pharmacy-based exchange, showed the same result.<sup>15</sup> A study of HIV incidence associated with the needle exchange program in Amsterdam, where syringes are also available through pharmacies, showed a protective effect in the early years, followed by a neutral effect and then elevated risk for program participants in subsequent years.<sup>16</sup> Although the data were insufficient to fully evaluate this trend, they were consistent with the inference that the more socially integrated users of the needle exchange might have switched to using pharmacies, as the Baltimore data suggest.<sup>15</sup>

These differences in access to sterile syringes from pharmacies could have important considerations for generating inferences from the US and Canadian studies. Also relevant is that subsequent reports from both Canadian studies have clarified that the higher HIV infection rates were associated with injection practices and not the program itself.<sup>17,18</sup> The Vancouver study group noted that needle exchange appears not to have prevented the onset of an outbreak of HIV infection, but the rapid drop in HIV rates in the follow-up study suggests that the outbreak was aborted; the extent to which needle exchange programs contributed to aborting the outbreak of HIV infection among injection drug users remains to be clarified. The experience in Canada and the United States reveals that the issue of measuring HIV incidence is complicated by a number of factors, all of which need to be considered in development and interpretation of the science.

In terms of hepatitis incidence, one study showed that needle exchange was associated with a lower risk of hepatitis B and C virus infections,<sup>19</sup> whereas a more recent study has shown no impact.<sup>20</sup> Again, it appears that inconsistent findings cloud the inferences for policy. However, given that hepatitis is transmitted much more readily than HIV, it is probably unreasonable to expect that programs designed to prevent HIV transmission will be equally effective in preventing the transmission of hepatitis (although the reverse might be expected to be true, i.e., programs designed to prevent hepatitis transmission should be equally effective in preventing transmission of HIV).

Inevitably, the concept of a randomized trial to demonstrate the effectiveness of needle exchange programs arises. However, caution in this direction is justified by the trial size required, the potential for crossover effects at the individual and community levels, and ethical concerns about conducting a trial when multi-government-sponsored reports have concluded that such programs can be effective in reducing HIV infection.

Another area where policymakers have provided an impetus for the epidemiologic study

of needle exchange programs is the issue of the "bridge to treatment." Many needle exchange studies are linked to drug abuse treatment programs. In 1996, 49% of 87 programs surveyed in the United States had a formal relationship to drug treatment programs; however, the proportion was significantly lower for illegal programs than for legal programs (34% vs 63%).<sup>21</sup> Having needle exchange programs available and with links to treatment is important: studies in the United States have shown that injection drug users attending needle exchange programs avail themselves of links to treatment, and there are data showing that referrals from needle exchange are more likely than standard referrals to represent clients without prior treatment experience.<sup>22</sup> Needle exchange programs in some areas have expanded to other services, including testing and treating for tuberculosis.<sup>23</sup> These studies suggest that needle exchange programs can provide an important role in initiating access to care for an otherwise hidden and difficult-to-reach population.

Needle exchanges—formerly found only in North America, Western Europe, and Australia—now exist in Eastern Europe, the former Soviet Union, South America, and Asia. Clearly, epidemiologic studies are needed in each of these areas to evaluate the programs in the context of the injection drug users who attend them.

Epidemiology has provided information critical to forming an empirical basis for a public health program. Epidemiology has a responsibility not only in conducting the studies but—when inconsistencies arise as new studies become available—in performing the investigations necessary to clarify the discrepancies and to guide policymakers and practitioners alike. It is clear that needle exchange programs vary, as do the persons who use such programs. Studies are under way to clarify which components of such programs contribute to risk reduction and which components do not. New studies are needed to identify characteristics of different communities in order to determine and develop strategies that will allow the communities to deal best with the problem of HIV infection. In the broader scheme, public health exists in a political context, and epidemiology, as a basic science of public health, is essential for working within the political context. □

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