



## Effects of Increasing Syringe Availability on Syringe-Exchange Use and HIV Risk: Connecticut, 1990–2001

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**ABSTRACT** *Syringe-exchange programs (SEPs) in Connecticut operate with caps on the number of syringes exchanged per visit. We investigated the effects of legislation increasing the cap on drug injectors' access to clean syringes through the SEPs in New Haven and Hartford. The mixed design of this study included longitudinal and cross-sectional data from individuals and ecological data from program operations. Five parameters—syringe return rate, syringes per visit to the SEP, syringe reuse rate, syringe human immunodeficiency virus (HIV) prevalence, and syringe sharing—were monitored through syringe tracking and testing of SEP syringes and by interviewing injectors. Two increases in the cap—from 5 to 10 and then from 10 to 30—had little effect on the five parameters that measured injectors' access to clean syringes. In contrast, access to clean syringes increased when the New Haven SEP first began operations, when syringes first became available at pharmacies in Hartford, and when the agency running the Hartford SEP changed. Legislation providing piecemeal increases in the cap may not, by themselves, be sufficient to increase injectors' access to clean syringes and decrease the risk of human immunodeficiency virus transmission in this population.*

**KEYWORDS** *HIV transmission, Injection drug use, Syringe exchange.*

### INTRODUCTION

Injection drug use is the second leading risk factor for human immunodeficiency virus (HIV) infection in the United States.<sup>1</sup> The most recent estimate of national HIV incidence, although 6 years old, suggests that injection drug users (IDUs) may comprise the majority of those with new infections.<sup>2</sup> Reducing syringe-borne spread of HIV through interventions aimed at altering individual behaviors<sup>3,4</sup> has been under way in the United States since the mid-1980s. In contrast, structural-level interventions, which aim at changing the social and contextual factors influencing HIV transmission, have been slower to develop.<sup>5–8</sup>

Among the first such structural interventions was a softening of the law in Connecticut that had made the possession and purchase of syringes without a prescription illegal. During the decade of the 1990s, three changes in legislation were made with the intention of increasing IDU access to clean syringes. The first, passed

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by the Connecticut legislature in June 1990, permitted the legal establishment of a syringe-exchange program (SEP) in New Haven and exempted SEP participants from the prescription law.<sup>9</sup> The SEP was operated under explicit guidelines<sup>10</sup>; it could exchange no more than 5 syringes per exchange, and all exchanges were 1 for 1. In a second set of changes,<sup>11</sup> in 1992, the state repealed its law banning the over-the-counter sale and possession of syringes and simultaneously expanded the number of SEPs from one to six and the number of syringes per visit from 5 to 10. A third change,<sup>12</sup> in 1999, expanded the number of syringes that SEPs could exchange to 30.

In this article, we look at the effect of increasing syringe availability on five parameters by which we can gauge the effectiveness of SEPs in Connecticut in reducing HIV transmission. The first parameter is the return rate, which measures the extent to which SEPs meet their customers' need for clean syringes. The second parameter is the number of syringes obtained per visit to the SEP. The third parameter is syringe reuse, which measures the numbers of times IDUs use each syringe before discarding it or returning it to the SEP. The fourth parameter is the prevalence of syringes containing blood infected with HIV-1; this measures the likelihood that a shared syringe could transmit HIV-1. The fifth and final parameter is syringe sharing, which measures the percentage of IDUs who, sometime in the month prior to interview, used a syringe previously used by another IDU. Some of the data included in this study (Table 1) are ecological, and came from tracking and testing data for the New Haven or Hartford SEP as a whole.<sup>13</sup> Other data have been collected from individuals using standardized survey instruments<sup>14,15</sup> or from individual-level syringe-tracking data.<sup>10,16</sup>

Analysis of the changes in these parameters as a function of the legislative changes permitting SEPs to exchange first 5, then 10, and now 30 syringes measures the penetrance of clean syringes into populations of IDUs who avail themselves of SEPs and can be used to explore the extent to which relaxation of the strictures on

**TABLE 1. Methods for assessing syringe access**

| Methods                | Data source   | Dates  |
|------------------------|---|--|
| Return rates           | Tracking marked syringes                                  | NH: 11/90–10/93<br>Htfd: 5/93–02/01                          |
| Syringes/visit         | Program logs  | NH: 11/90–10/93<br>7/01–12/01                                |
|                        | Syringe testing   | Htfd: 5/93–3/97  |
|                        | Self-report   | NH: 1/00–6/01<br>Htfd: 11/98–6/01                            |
| Re-use rates           | Estimates from syringe tracking                           | NH: 11/90–10/93  |
|                        | Self-report   | NH: 1/00–6/01<br>Htfd: 11/98–6/01                            |
| Syringe HIV Prevalence | Testing syringes returned to the syringe-exchange program | NH: 11/90–10/93<br>Htfd: 5/03–2/01                           |
| Syringe Sharing        | Self-report   | NH: 11/90–10/93<br>1/00–6/01<br>Htfd: 8/92–6/93<br>6/98–6/01 |

Htfd, Hartford; NH, New Haven.

syringe availability has been correlated with decreased HIV-1 transmission risks among IDUs in Connecticut. While none of the parameters on its own would be sufficient to firmly establish the linkage between legal change and reduced HIV risk, if the trends from multiple parameters were synchronous, it would suggest that structural changes in the laws regulating syringe availability, by themselves, might be sufficient to reduce HIV risk.

## **METHODS**

### **Syringe-Exchange Program Operations**

The New Haven Needle Exchange Program (NHNEP) began in November 1990 and has been operated throughout its existence by the Health Department of the City of New Haven. Until the end of September 1992, the program exchanged syringes on a 1-for-1 basis to a maximum of 5 syringes per visit to NHNEP. After that, the cap on syringes was increased to 10 until the end of September 1999, when the cap was increased to 30 per visit. Data were collected for 36 months from the start of the program through October 1993. Beginning in late 1999, New Haven IDUs were recruited through a targeted sampling plan as part of a study funded by the National Institute on Drug Abuse of syringe-access patterns. The Hartford Syringe Exchange Program (HSEP) began in February 1993, operated by the Hartford Health Department. In June 1995, operation of HSEP was assumed by the nonprofit agency AIDS Project Hartford. From the program's outset until the end of September 1999, the program exchanged syringes on a 1-for-1 basis to a maximum of 10 syringes per visit to HSEP; after that, the cap on syringes was increased to 30 per visit.

### **Syringe-Tracking Methods**

All syringes distributed by the SEPs were marked. In New Haven, the syringes distributed by NHNEP possessed printed markings on their barrels that were distinct from markings found on any syringes available in the United States and were uniquely labeled with sequential numbers. Syringe-tracking methodologies have been described in detail elsewhere.<sup>10,13,17,18</sup> Briefly, all syringes distributed by NHNEP were sequentially numbered, and all returned syringes were collected and analyzed. This allowed the creation of two databases that, when merged, allowed us to calculate the percentage of syringes originating from the program that were returned. Of those recovered, more than 90% were returned with their unique tracking number intact.<sup>18</sup>

In Hartford, syringe tracking was carried out in two phases. From April 1993 through April 1997, syringes distributed by the SEP were labeled sequentially. All syringes returned to the exchange during discrete 2-week periods were collected. Beginning in 1998, syringes distributed were no longer sequentially numbered, but instead were specially manufactured with markings on their barrels distinct from those found on any syringes available anywhere else in the world. Syringe-tracking data from 2- and 8-week collection cycles were included in this last analysis.

### **Syringe Return**

The proportion of syringes originating from an SEP that were returned provides an ecologic assessment of the extent to which that SEP fulfills the need of customers by revealing the percentage of syringes that IDUs have obtained from sources other

than the SEP. For the assessment of return rates, labeling of the syringes originating from the SEPs was essential. Return rates were computed based on the tracking data by dividing the number of returned syringes that originated from the SEP by the total number of syringes returned to the SEP.

### **Syringes per Visit to the Syringe-Exchange Program**

The mean number of syringes returned by clients per visit to the exchange was calculated by a variety of methods. In New Haven between November 1990 and August 1993 and again between July and October 2001 and in Hartford between April 1993 and March 1997, the data came from syringe-tracking and syringe-testing records and were individual and cross sectional in nature. Additional data have been collected by self-report from samples of 185 customers of the Hartford SEP between July 1998 and November 2001 and 89 customers of NHNEP between December 1999 and November 2001.

### **Syringe Reuse Frequencies**

Two estimates of syringe reuse among NHNEP customers in the months between the start of the program in November 1990 through October 1993 involve ecologic measures calculated from syringe-tracking data. These methods have been described in detail elsewhere.<sup>19</sup> More recent data on syringe reuse in New Haven were collected by self-report from 320 individual IDUs between December 1999 and November 2001. Individuals were asked: "How many shots do you usually get from a syringe before you stop using it?" For this sample, 89 NHNEP customers and 231 noncustomers were interviewed by convenience sampling of 40 IDUs in each of eight city neighborhoods.

In Hartford, data on syringe reuse came from three cross-sectional studies. The first source was an analysis funded by the Centers for Disease Control and Prevention of the effects of legalizing syringe possession and over-the-counter pharmacy sales<sup>15</sup>; the analysis was conducted between August 1992 and June 1993. A questionnaire was used for the second and third sources; it was administered first to a sample of 129 IDUs (50 customers, 79 noncustomers) between July 1998 and October 1999 and later to a sample of 336 IDUs (135 customers, 201 noncustomers) between December 1999 and November 2001. The question on syringe reuse was phrased identically to that used in New Haven. The first sample was assembled by snowball sampling beginning with SEP customers and then recruiting two waves of noncustomers; the second was assembled by convenience sampling of 40 IDUs in each of eight city neighborhoods.

### **Syringe HIV Prevalences**

Syringe HIV prevalence, that is, the percentage of syringes contaminated with blood from an HIV-positive individual, was determined. New Haven syringes were tested using a polymerase chain reaction (PCR) method that was capable of detecting a single molecule of HIV-1 cDNA from infected cells.<sup>20</sup> Hartford syringes were tested using an enzyme immunoassay (EIA) that was capable of detecting antibodies to HIV-1, on average, in as little as 0.001  $\mu$ l of blood.<sup>21</sup> Comparison of the two methods revealed that, when the contents of individual syringes were tested, 90% of 50 syringes gave identical results in the two assays.<sup>22</sup> Testing parallel samples of syringes returned at the three separate intervals during the New Haven evaluation revealed prevalences that were statistically identical within, but not between, intervals.

### Syringe Sharing

The percentage of IDUs sharing at least one syringe in the 30 days prior to being interviewed was determined. In New Haven, the data came from two sources, the first longitudinal and the second cross sectional. The first source was interviews of 192 NHNEP customers conducted between 1990 and 1993 on their enrollment in the program and follow-up interviews conducted 9 to 33 months later. The second source was interviews of 320 active drug users conducted between December 1999 and November 2001. In Hartford, data also came from two sources, both of cross-sectional design. The first source was the analysis of the effects of legalizing pharmacy syringe sales<sup>15</sup> conducted between August 1992 and June 1993. The second source was two sets of cross-sectional interviews with IDUs conducted between July 1998 and October 1999 and between December 1999 and November 2001.

### Statistical Analyses

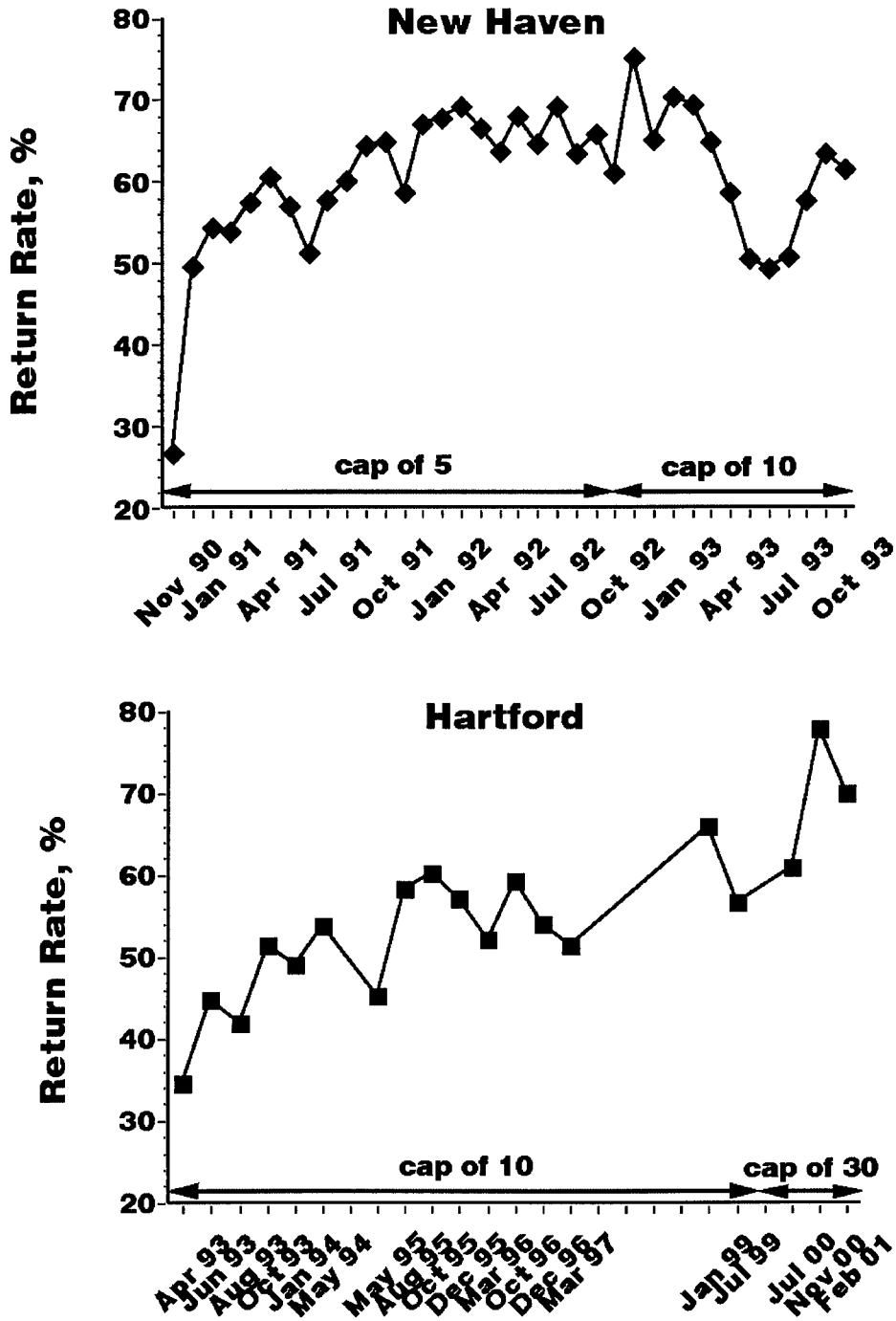
The five measures of SEP penetrance and effectiveness were analyzed comparing the results between periods when the cap on exchanges was 5, 10, or 30 syringes. In New Haven, comparisons of syringe reuse frequency and HIV-1 syringe prevalence were made between times before and after the establishment of the SEP. Syringe return rates, the number of syringes per visit, and the number of uses per syringe were compared using analyses of variance (ANOVAs) with Bonferonni post hoc tests when appropriate. Syringe HIV-1 prevalence and sharing rates were compared using chi-square statistics. Tests for temporal trends within periods and between periods were analyzed using linear regression.

## RESULTS

### Syringe Return

During the tracking and testing period in New Haven, from November 1990 through August 1993, a total of 85,630 syringes were returned to the SEP. Of these, 56,230 were returned when the cap was 5 syringes per visit (November 1990 to September 1992), and 29,400 were returned when the cap was 10 (October 1992 to October 1993). During the period when the cap was 5, an average of 2,445 syringes was returned per month. After the cap was increased to 10, an average of 2,262 syringes was returned. The syringe return rates were similar before and after the cap changed: 63.3% before October 1, 1992, and 62.1% afterward. The data on return rates by month reveal that the most important change observed in the 36 months of study occurred in the first 3 months of the study, when the return rates climbed from 26.8% to 54.4% (Fig. 1, top). Linear regression analyses of the return rates thereafter revealed a small, but significant, increase of 0.68% per month during the period before the cap was increased to 10 ( $r^2 = 0.615$ ). During the 13 months after the increase, there was no significant deviation from the mean return rate ( $r^2 = 0.286$ ). The mean return rates in the 13 months before and after the increase in the cap were not statistically different,  $65.7\% \pm 2.8\%$  before the increase and  $61.4\% \pm 7.9\%$  afterward, despite a noticeable decline in return between May and July 1993.

In Hartford, the data suggest a trend toward increasing syringe return rates during the course of 7 years of program operations (Fig. 1, bottom). However, on closer analysis, several features suggest that a simple linear relationship does not accurately characterize what occurred. First, consistent with the data from New



**FIGURE 1.** Return rate of SEP syringes. The percentage of syringes originating from the exchange that were returned was determined by syringe tracking for (A) New Haven and (B) Hartford.

Haven, there was an increase in return rates immediately following the program's start. The return rate for syringes collected in April 1993 was 34.5%, and by June and for every month thereafter, return rates exceeded 40%. For the period from June 1993 through May 1995, when the program was operated by the Hartford Health Department, the average return rate was  $45.3\% \pm 6.8\%$ . Once the operations of the Hartford SEP shifted from the health department to AIDS Project Hartford, the average return rate increased to  $57.2\% \pm 4.5\%$  for the period from August 1995 through July 1999. After the cap was increased to 30, the average return rate was  $67.5\% \pm 14.5\%$ .

### Syringes Per Visit

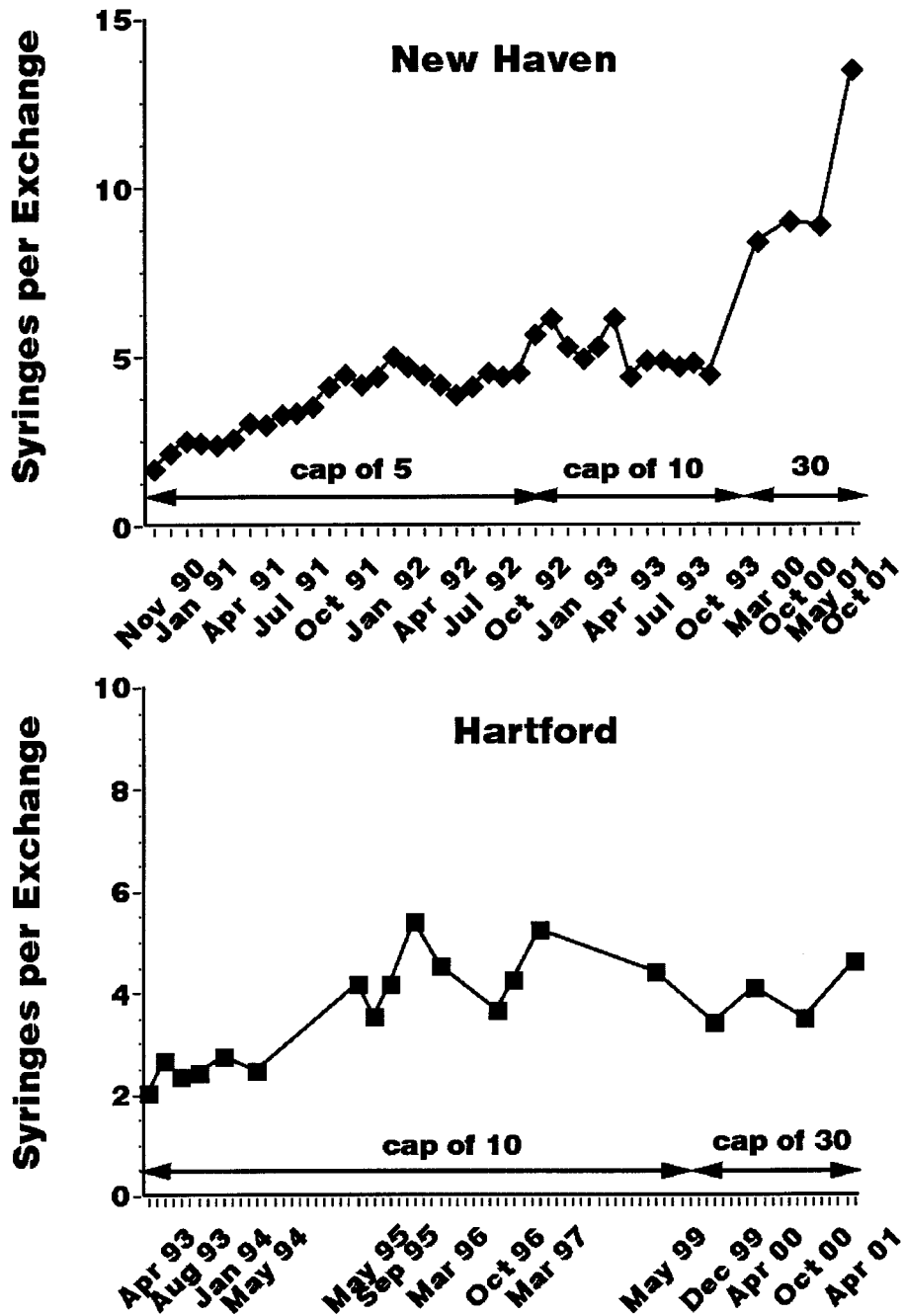
NHNEP, operating with a cap of 5 syringes per visit, saw the number of syringes exchanged per visit increase from 1.7 in November 1990, to 4.1 in October 1991, and to 4.5 in September 1992 (Fig. 2, top). Thus, the increase was concentrated in the first year of the program. Following the increase in the cap to 10, the mean number of syringes exchanged per visit transiently increased, but the monthly averages for the 13 months prior to and following the increase in the cap were not significantly different ( $4.3 \pm 0.37$  versus  $5.1 \pm 0.60$ ,  $P > .05$ ). Once the cap was increased to 30, the mean number of syringes obtained per visit increased significantly to 8.4 in early 2000 and 13.5 in late 2001 ( $P < .001$ ).

HSEP also experienced an increase in the mean number of syringes per exchange, but unlike New Haven, the increase did not occur during the first year of program operations (Fig. 2, bottom). During these first 2 years, when the program was operated by the city health department, the average was  $2.7 \pm 0.7$ . The mean number increased significantly ( $P < .05$ ) to  $4.4 \pm 0.7$  when operations were assumed by AIDS Project Hartford, but remained unchanged ( $3.9 \pm 0.4$ ,  $P > .05$ ) when the cap increased to 30.

### Syringe Reuse Rates

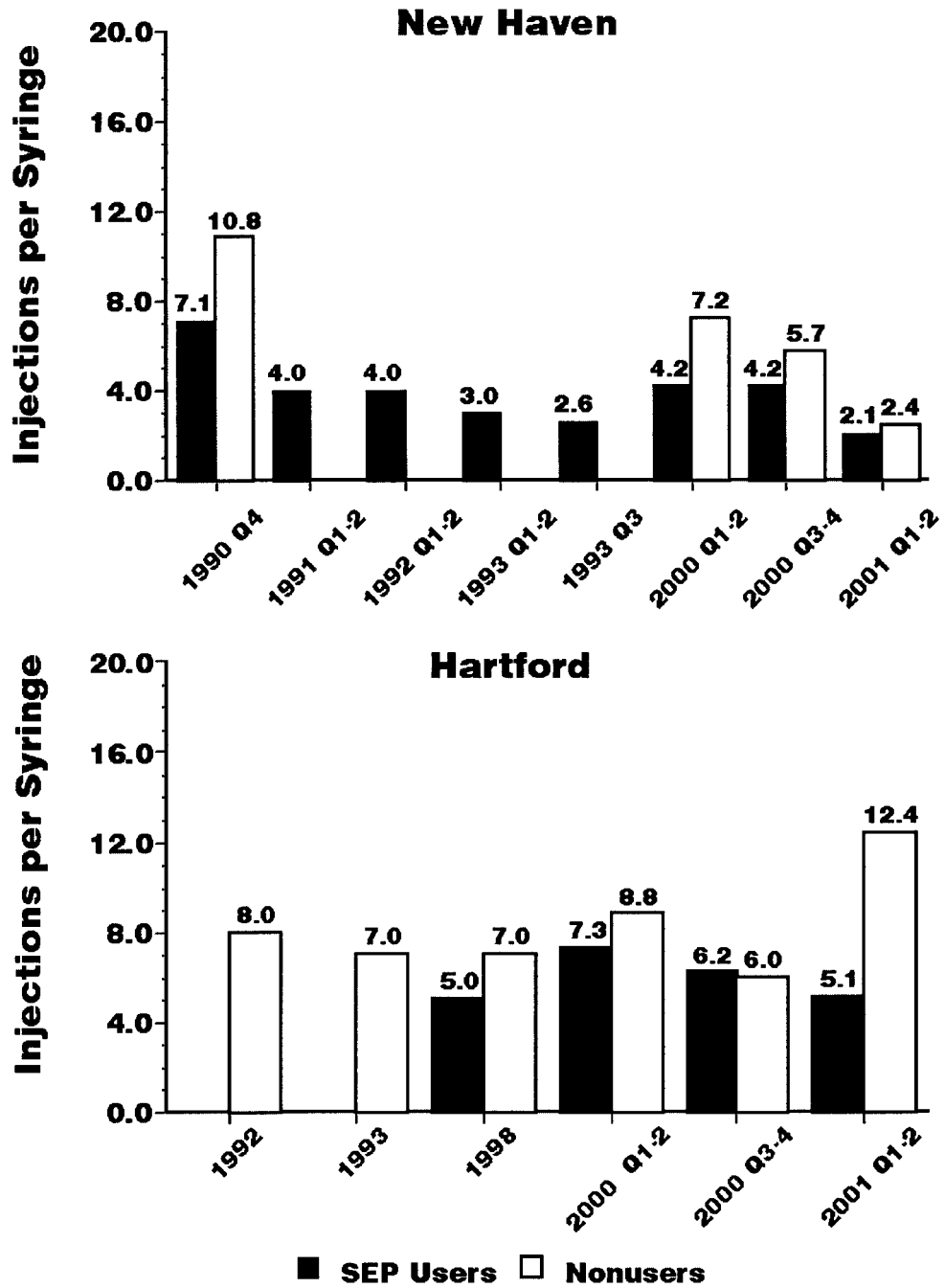
Two estimates of syringe reuse rates among IDUs in New Haven were calculated from syringe-tracking data for 1990–1993. In the first estimate, the average number of injections per syringe was 10.8 among individuals who did not use NHNEP in 1990 (Fig. 3, top). Syringe reuse among NHNEP customers decreased from 7.1 injections per syringe at the start of NHNEP to 4.0 after 6 months, 4.0 after 18 months, 3.0 after 27 months, and 2.6 after 33 months (Fig. 3, top). In the second estimate (data not shown), syringe reuse frequencies were 7.1 prior to the start of the exchange, falling to 4.0, 4.0, 3.0, and 2.6 after 6, 18, 27, and 33 months of NHNEP operations, respectively.<sup>19</sup> From self-report in 2000 and 2001, syringe reuse rates were 3.0 among 89 SEP customers and 4.7 among the 231 who obtained syringes from other sources, including pharmacies and less-reliable sources (Fig. 3, top). Changes in the cap from 5 to 10 were associated with a small, but nonsignificant, decrease in the average number of injections per syringe, while the increase to 30 was not associated with change in reuse rates among SEP customers.

In Hartford, syringe reuse rates were obtained before and after pharmacy sales without a prescription were legalized (1992 versus 1993) and before and after the increase in the cap to 30 (1998 versus 2000). Legalization of syringe purchases did not appreciably decrease reuse ( $P > .6$ ), and the reuse rates among IDUs who were not HSEP customers remained unchanged up to 7 years later (Fig. 3, bottom). In both 1998 and 2000–01 customers of HSEP tended to reuse their syringes fewer times than did IDUs who obtained syringes from other sources. Differences between



**FIGURE 2.** Syringes per visit to the SEP. The mean number of syringes obtained by clients visiting the SEPs was determined from syringe tracking or self-reported data for (A) New Haven and (B) Hartford.





**FIGURE 3.** Syringe reuse rates. The mean number of injections per syringe was determined from syringe tracking or self-reported data for (A) New Haven and (B) Hartford.

customers and noncustomers, on the whole, were significant ( $P < .05$  for both periods).

### HIV Prevalence in Returned Syringes

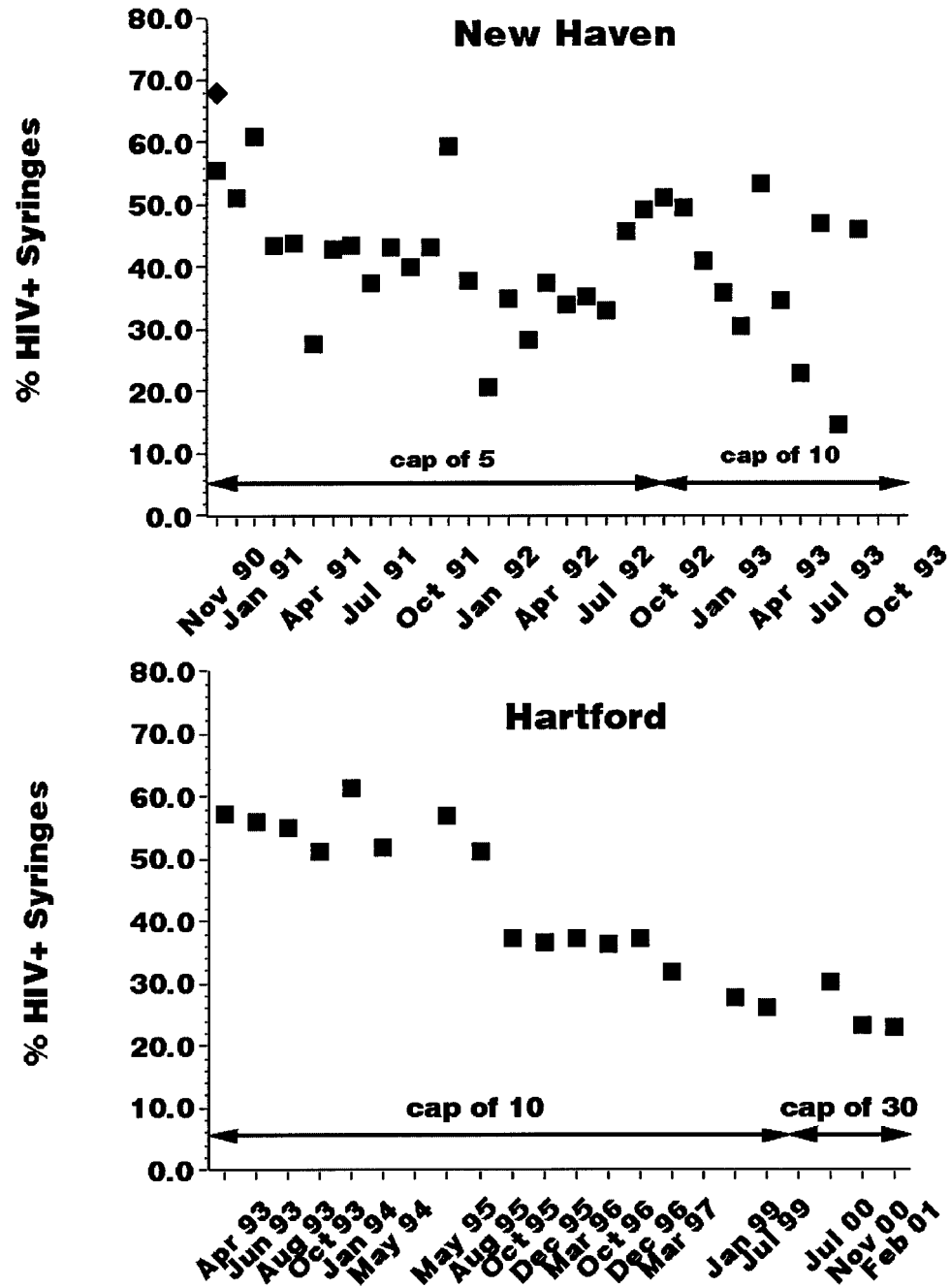
In New Haven, 5,954 syringes returned to NHNEP were tested to determine the prevalence of syringes containing blood from an individual infected with HIV-1. In syringes collected before and at the start of NHNEP, prevalences were 62.8% ( $n = 180$ ) and 67.5% ( $n = 160$ ), respectively (Fig. 4, top). Within 4 months, the prevalence had fallen to 44.0% ( $n = 111$ ). Thereafter, despite month-to-month fluctuations, the prevalence remained constant. There was no statistical difference in prevalence in the 13 months before the cap increased to 10 ( $38.5\% \pm 9.7\%$ ,  $n = 2,090$ ) and the 11 months after the increase ( $38.9\% \pm 12.5\%$ ,  $n = 1,672$ ).

In Hartford, 7,461 syringes returned to HSEP were tested to determine the prevalence. The testing data revealed three distinct sets of prevalences, with a sharp decline in prevalence between August and October 1995 and a smaller decline after March 1997 (Fig. 4, bottom). A total of 2,036 syringes were tested during the first period, and prevalences ranged between 51% and 62%, with a mean prevalence of  $55.1\% \pm 3.6\%$ . Between October 1995 and March 1997, a total of 1,010 syringes were tested, with a mean prevalence of  $36.0\% \pm 2.1\%$ . The difference was statistically significant ( $P < .001$ ). After testing resumed in January 1999, 4,128 syringes were tested, with a prevalence of 27.4%, a significant decrease from the previous period of testing ( $P < .001$ ). During this last period, the cap was increased from 10 to 30. Syringe prevalence before the increase was 26.4% ( $n = 3,229$ ) and 29.0% ( $n = 953$ ) afterward, and the difference was not statistically significant ( $P > .12$ ).

### Syringe-Sharing Rates

In New Haven, prior to enrollment, 60 of 192 IDUs (31.3%) reported having used someone else's syringe within the past 30 days. When interviewed after using NHNEP between 9 and 33 months, only 37 of the IDUs (19.3%) reported having used someone else's syringe. Participation in NHNEP was associated with a significant 38.3% decline in syringe sharing ( $P < .01$ ). Interviews in 1999–2001 revealed that 84.1% (269 of 320) obtained their syringes from safe sources (either NHNEP or pharmacies) and that 19.6% (62 of 316) reported having used someone else's syringe. Among the 87 participants reporting that the SEP was their primary source of syringes, 14 (16.1%) reported having used someone else's syringe. Thus, after nearly a decade, there was no further significant decline in the self-reported rates of syringe sharing ( $P < .50$ ).

In Hartford, cross-sectional data were collected before and after syringes became legally available.<sup>15</sup> In mid-1992, prior to legal availability, 44 of 124 IDUs (35.5%) reported having used someone else's syringe. Approximately a year later, only 32 of 134 (23.9%) reported doing so, a significant 32.7% decrease ( $P < .01$ ). A follow-up study, conducted 6 years later, just before the cap was increased to 30, revealed that 42 of 129 IDUs (32.6%) reported having used someone else's syringe within the past 30 days. Among these were 45 SEP customers, of whom 10 (22.2%) reported sharing syringes. A second follow-up study was conducted after the cap was increased to 30. Interviews in 1999–2001 revealed that 63.7% (214 of 336) obtained their syringes from safe sources (either HSEP or pharmacies), and that 17.0% (57 of 335) reported having used someone else's syringe. Of the 134 participants reporting that the SEP was their primary source of syringes, 19 (14.2%) had



**FIGURE 4.** HIV prevalence in returned syringes. The prevalence of syringes contaminated with blood infected with HIV-1 was determined (A) for New Haven by polymerase chain reaction and (B) for Hartford by enzyme immunoassay.

shared syringes in the past 30 days. The difference between the percentages before and after the cap increased was not significant ( $P < .20$ ).

**DISCUSSION**

Syringe availability through SEPs in Connecticut has gone through four phases since 1990, each as a result of legislative change. At each transition, the number of syringes that could be exchanged per visit to an SEP was increased from 0 to 5, then to 10, and most recently to 30. The data on the number of syringes exchanged per visit (Fig. 2) clearly indicate that, in practice, the caps were adhered to by both the Hartford and New Haven SEPs. We have attempted to investigate the impact of legislation increasing syringe availability among IDUs in Connecticut on the actual access to clean syringes experienced by IDUs in New Haven and Hartford. By employing a combination of syringe-tracking and syringe-testing methods and survey methods, we have developed individual-level and ecological data to test the hypothesis that increases in the number of syringes that SEP customers could exchange per visit resulted in actual increases in syringe availability and decreased risk for HIV transmission. The results, however, revealed that increasing the cap had little effect on increasing syringe availability or decreasing risk of HIV transmission (Table 2). Return rates, syringes per visit, syringe reuse rates, and the prevalence of syringes used by IDUs infected with HIV-1 were not consistently improved concomitant with increased syringe availability by law.

There were several limitations to this study. First, the data that define each parameter can come from a variety of sources, and consistent methods of collection throughout the decade-long study period were not used. Nonetheless, analysis of multiple methods to estimate syringe reuse appeared to yield consistent results. Second, over the decade, some differences, especially in the self-reported data, might be expected to have occurred as a result of changing awareness of HIV-1 transmission among IDUs. For this reason, we have included self-reported data on syringe reuse, which has not been emphasized in HIV prevention education messages and, therefore, is less subject to response biases.<sup>19</sup> Third, all of the data, whether ecologic

**TABLE 2. Associations between increasing cap and syringe access**

|                    | Transitions |          |           |
|--------------------|-------------|----------|-----------|
| New Haven          | 0 to 5      | 5 to 10  | 10 to 30  |
| Return rate        | Yes         | No       | ND        |
| Syringes/visit     | Yes         | No       | Yes       |
| Injections/syringe | Yes         | No       | No        |
| Syringes HIV+, %   | Yes         | No       | ND        |
| Syringe sharing    | Yes         | ND       | No        |
| Hartford           | 0 to 10     | 10 to 30 | HD to APF |
| Return rate        | ND          | Yes      | Yes       |
| Syringes/visit     | ND          | No       | Yes       |
| Injections/syringe | ND          | No       | ND        |
| Syringes HIV+, %   | ND          | No       | Yes       |
| Syringe sharing    | Yes         | No       | ND        |

HD to APF, Hartford City Health Department to AIDS Project Hartford; ND, not determined.

or individual in nature, were cross sectional and not longitudinal. Changes over time may have been due to differences in the sampling methods, as well as to changes in individual behaviors. Nevertheless, the consistency of each parameter over time and the fact that multiple parameters told the same story (Table 2) suggested that the strength of using multiple parameters to monitor the consequences of the piecemeal increase in syringe availability outweighs its weaknesses.

In New Haven, the only consistent improvements noted during the 10 years under study occurred when the SEP first began. The improvement in New Haven has been estimated to have resulted in at least a one-third reduction in new HIV-1 infections.<sup>17,18,23</sup> The reason we believe that we were able to see such a large decrease was that the opening of NHNEP in November 1990 occurred in a climate of extreme syringe shortage brought about by the laws that made the purchase or possession of syringes without a prescription a crime.<sup>9</sup> In Hartford, a similar relaxation in syringe shortage occurred after purchase and possession became legal throughout Connecticut in October 1992. By the time HSEP began 5 months later, no significant changes in return rates, syringe per visit, and syringe HIV prevalence were observed during the first few months of the program. Instead, changes were observed in the middle of 1995, and these can be attributed to structural improvements made in operations of HSEP that resulted from the transfer of the program from the city health department to the nonprofit organization AIDS Project Hartford.<sup>11</sup> In both cities, the data reveal that few, if any, of the five parameters changed as a direct result of increasing the cap (Table 2).

This finding stands in contrast to findings elsewhere following increases in syringe availability. In Hawaii,<sup>24</sup> for instance, syringe exchange began in 1990 with a cap of 5, which was increased to 25 in 1993, and removed completely in 1996. Customers of the Hawaiian exchanges report declining levels of sharing in response to these changes and have HIV prevalence rates that have declined from 5% to less than 1%. In Vancouver, Canada, in response to an outbreak of HIV infections among IDUs, the program was expanded, and the cap on the number of syringes per exchange was removed. What distinguishes the approach in Hawaii and in Vancouver from that taken in Connecticut is that in the former locales syringe availability increased in conjunction with increases in SEP services and hours of operation. Connecticut merely increased the cap; it failed to provide funding to expand program operations.<sup>12</sup>

In summary, our study revealed two aspects of the attempt to reduce the transmission of HIV-1 among IDUs in Connecticut by providing legal access to clean syringes. First, the largest increase in access occurred when syringes, which had been made scarce by laws prohibiting sale and possession without a prescription, were first made legally available. Second, there were no consistent increases associated with legislative action to incrementally increase availability, whether from 5 to 10 or from 10 to 30. These findings, and the difference between Connecticut and Hawaii, emphasize the need for increased resources for SEPs and for reducing the barriers IDUs face in accessing clean syringes. Sometimes, the legal availability of syringes is not as important as finding appropriate and acceptable ways to get those syringes into the hands of those who need them. While legal availability is necessary, as evidenced by changes in New Haven associated with the start of NHNEP, it may not be sufficient to reduce HIV risk and transmission among IDUs. Other factors—including police harassment of IDUs and the SEPs that serve them, the provision of other services that enhance SEP operations, and the structure and

operating procedures of the program—may be more important once syringes become legally available.<sup>11,12,25–27</sup>

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