Prevalence & predictors of transitions to & away from syringe exchange use over time in 3 US cities:
The impact of syringe dispensing policy changes

Traci Craig Green, Ricky N. Bluthenthal, Merrill Singer, Leo Beletsky, Lauretta E. Grau, Patricia Marshall, Robert Heimer

Yale School of Public Health
Yale Center for Interdisciplinary Research on AIDS

IHRA Liverpool
27 April 2010
Background

• Syringe exchange programs (SEPs) reduce HIV risk among IDUs but SEP attendance can depend on: local leadership, policing, & state & local syringe possession & dispensing policies

• SEPs benefit non-participants by receipt of sterile syringes exchanged/redistributed by direct SEP users (“indirect” SEP use)
  – The frequency & predictors of transitioning over time to & from direct, indirect, & non-use of SEPs are unknown

• Differences in syringe dispensing policies influence syringe re-use, syringe coverage, syringe sharing, & SEP attendance patterns.
  – It is not known whether these differences influence the probability of an IDU becoming a Direct SEP user & what other factors might influence transitions into direct SEP use
Study Aims

(1) To quantify & characterize the transition probabilities of SEP attendance typologies over a one-year period among IDUs involved in a multi-city cohort study

(2) To identify factors associated with (a) change in SEP user status in one year’s time & (b) transition to Direct SEP use & maintenance of Direct SEP use over one year

(3) To quantify & characterize the transition probabilities of SEP attendance typologies before compared to after a change in syringe dispensing policy
DIFFUSION OF BENEFIT (DOB) STUDY
1998 – 2001

• Designed to determine if SEP benefits diffuse beyond direct participants to other drug users in the community, such as indirect exchangers
• Annual assessments over 3 years among IDUs in 3 US cities: Hartford, Oakland, Chicago
• Recruitment represented varying involvement with SEPs; \(<25\%\) direct SEP users
• SEPs in each city had distinct operating characteristics
• “Natural experiment” during study period: syringe dispensing policy changes in 2 cities
<table>
<thead>
<tr>
<th></th>
<th>HARTFORD</th>
<th>OAKLAND</th>
<th>CHICAGO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange volume</td>
<td>Small; avg &lt;5 syringes exchanged/ participant</td>
<td>Large; &gt;100 syringes exchanged/ participant</td>
<td>Large; &gt;100 syringes exchanged/ participant</td>
</tr>
<tr>
<td>Limits/nature</td>
<td>Cap of 10/1-for-1; cap increased to 30 on 9/1/1999</td>
<td>No cap; 1-for-1 plus 5; 7 syringe starter pack</td>
<td>No cap; 2-for-1 to 10; 1-for-1 thereafter. 6/1/2000 became ‘as needed’</td>
</tr>
<tr>
<td>Legal status/organizational type</td>
<td>Legal; non-governmental organization run</td>
<td>Legal; non-governmental organization run</td>
<td>Exempt; non-governmental organization run</td>
</tr>
<tr>
<td>Pharmacy access to syringes</td>
<td>YES, cap of 10 until 9/1/1999 then cap of 30</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Drug paraphernalia law</td>
<td>NO</td>
<td>YES</td>
<td>YES; SEP users exempt</td>
</tr>
</tbody>
</table>
ANALYTIC SAMPLE

• Baseline, one-year follow-up data from 583 IDUs (Aims 1 & 2)
• Syringe policy change cities only (Aim 3): assessments closest to before/after policy change date, N=228

MEASURES

• Self-reported information on SEP use, Time 1 & 2
• Baseline covariates: city, socio-demographics, homelessness, drugs used past 30 days, self-reported health & hepatitis & HIV status, past year experience of overdose, & having been stopped by police for carrying drug paraphernalia in past year

DATA ANALYSIS

• Latent transition analysis (LTA) with covariates
  -3 dichotomous (yes/no) indicators of SEP use typology (past 12 months): having used an SEP; knowing someone who has used an SEP; having received SEP syringes &/or materials from someone who uses an SEP
Results

- A 3-class LTA model fit best
- The probability of responding to each question, given that the person is a member of the specific class, conveys the meaning of the detected SEP use typologies

<table>
<thead>
<tr>
<th></th>
<th>Direct SEP users</th>
<th>Indirect SEP users</th>
<th>Isolated IDUs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Have you used an SEP in the past year?</strong></td>
<td>0.93</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Do you know others who use an SEP in the past year?</strong></td>
<td>0.97</td>
<td>1.00</td>
<td>0.64</td>
</tr>
<tr>
<td><strong>In the past year, have you received syringes and/or materials from someone who attends an SEP?</strong></td>
<td>0.98</td>
<td>1.00</td>
<td>0.02</td>
</tr>
<tr>
<td><strong>Have you used an SEP in the past year?</strong></td>
<td>0.07</td>
<td>1.00</td>
<td>0.99</td>
</tr>
<tr>
<td><strong>Do you know others who use an SEP in the past year?</strong></td>
<td>0.03</td>
<td>0.00</td>
<td>0.36</td>
</tr>
<tr>
<td><strong>In the past year, have you received syringes and/or materials from someone who attends an SEP?</strong></td>
<td>0.03</td>
<td>0.00</td>
<td>0.98</td>
</tr>
</tbody>
</table>
After one year, most IDUs had transitioned into Direct SEP users.
Direct SEP users exhibited greatest stability over time.

In one year, **Indirect SEP users** were more likely to become Direct SEP users than to stay Indirect SEP users or to become Isolated IDUs; **Isolated IDUs** were more likely to become Direct vs. Indirect SEP users.
PREDICTORS OF TRANSITIONS BETWEEN TYPOLOGIES

- City, injection of speedballs, & having been stopped by police for drug paraphernalia predicted both *becoming* & *maintaining* Direct SEP user status

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Becoming a Direct SEP user Adjusted Odds Ratio [95% CI]</th>
<th>Maintaining Direct SEP user status AOR [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of recruitment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hartford</td>
<td></td>
<td>2.89 [1.60, 5.23]</td>
</tr>
<tr>
<td>Having been stopped by police for drug paraphernalia, past year</td>
<td>2.98 [1.61, 5.52]</td>
<td>2.58 [1.29, 5.17]</td>
</tr>
<tr>
<td>Past month injection of speedballs</td>
<td>1.82 [1.1, 2.94]</td>
<td>2.27 [1.38, 3.75]</td>
</tr>
<tr>
<td>Homelessness, past year</td>
<td>2.0 [1.27, 3.14]</td>
<td></td>
</tr>
<tr>
<td>Female sex</td>
<td></td>
<td>1.81 [1.13, 2.91]</td>
</tr>
<tr>
<td>Latino ethnicity</td>
<td></td>
<td>1.89 [1.08, 3.30]</td>
</tr>
<tr>
<td>Syringe re-use</td>
<td></td>
<td>0.45 [0.33, 0.60]</td>
</tr>
</tbody>
</table>
EFFECT OF POLICY CHANGE ON SEP USE OVER TIME

• Cities with a syringe dispensing policy change had:
  ➢ stronger **maintenance of Indirect SEP user status**
    (transition probability=0.74 vs. 0.56 for Isolated IDUs &
    Direct SEP users)
  ➢ higher **increase in the prevalence of Indirect SEP users**
    (from 43% to 51%) than of Direct SEP users
    (29% to 31%)

• Factors influencing transition: city, homelessness, past
  month injecting cocaine, & being stopped by police for
  drug paraphernalia in the past year

• **In Chicago** (**policy change=exchange to distribution**),
  Direct SEP users & Isolated IDUs more likely to become
  Indirect SEP users

• **In Hartford** (**policy change=nominal increase in cap**),
  Direct SEP users more likely to become Isolated IDUs
  than to become Indirect SEP users
Limitations

• Low follow up rates in cohort study (51%, 45% at Follow up 1, 2)
• Non-random sample, possible limits to generalizability
• Unmeasured covariates, especially at Time 2
• Could not stratify by city or ethnicity due to small sample size
Conclusions

• In one year, IDUs tended to transition to direct use of SEPs

• Direct SEP users rarely severed ties entirely with the SEP

• Secondary syringe exchange appears to be affected more than direct syringe exchange by syringe dispensing policies that increase syringe availability

• Police contact involving possession of drug paraphernalia may act as a possible tool in public health interventions for IDUs, including encouragement of SEP attendance
Thank you!

Supported by a Kirschstein Pre-doctoral National Research Service Training Fellowship, NIDA to TCG (5F31DA023862)

traci.c.green@brown.edu