HIV and Sexual Partnerships between Injection Drug Users and Non-Injection Drug Users

Samuel Jenness, MPH
NYC Department of Health

National HIV Prevention Conference
August 25, 2009
Acknowledgements

Coauthors
Christopher Murrill, PhD
Alan Neaigus, PhD
NYC Dept. of Health
Holly Hagan, PhD
NYU College of Nursing
Travis Wendel, JD
National Development and Research Institutes

NYC Field Team
Alix Conde
Libertad Guerra
Noel Trejo
Aundrea Woodall

CDC Colleagues
Liz DiNenno
Amy Drake

CDC Grant#: U62/CCU223595-03-1
Heterosexual HIV

- In NYC, heterosexual sex is transmission risk for 24% of prevalent and 33% of incident (2006) HIV diagnoses.
- Heterosexual HIV disproportionally affects women and non-whites.
- These groups test late and delay HIV medical care.
- Figuring out who is a "high-risk" heterosexual is complex.
Individual and Network-Level Risks

- Multiple partners and unprotected sex do not fully explain heterosexual HIV risk
- Racial segregation of partnerships, concurrency, and partnerships between “low-risk” women and bisexual or incarcerated men
- 8% of NYC heterosexual diagnoses attributed to IDU sex partnerships
- Risky injection is declining but risky sex is not
Research Questions

- How prevalent are IDU/non-IDU sex partnerships?
- What are the characteristics of non-IDU heterosexuals with IDU partners?
- Are IDU sex partnerships a plausible risk factor driving the heterosexual HIV epidemic?
  - Is having a partner with IDU history or unknown IDU history independently associated with HIV infection?
National HIV Behavioral Surveillance

- Investigates HIV infection, HIV risk factors, HIV testing, and use of HIV prevention services
- Study funded by CDC & designed collaboratively
- 20–25 U.S. cities with highest AIDS burden
- Ongoing, cyclical data collection to study MSM, IDU, and high-risk heterosexuals (HET)
- Cross-sectional design
- Anonymous interviewer-administered structured survey & HIV test
High-Risk Heterosexual Definition

* Man or woman between 18 and 50 years old
* Had opposite-sex vaginal/anal sex in past year
* Resides in or recruited by someone who lives in a “high-risk area” (HRA) in NYC
  - 30 zip codes with highest rates of heterosexual HIV and poverty
* Speaks English/Spanish
* Resident of NYC
Respondent-Driven Sampling (RDS)

- Ethnographer recruits initial participants (‘seeds’) through street and facility outreach
- Seeds recruit up to 3 other participants
- Those participants recruit up to 3 others
- And so on, until target sample size is met
- Incentives provided for participating and recruiting
Measures

- IDU sex partnerships
  - Last sex partner: IDU, unknown, non-IDU
  - Past year partners, hierarchically: IDU, unknown, non-IDU
- HIV and HCV infection determined by whole blood testing
- Independent variables: demographics, unprotected sex with a casual/exchange partner (‘risky sex’), STD diagnoses, crack use
Statistical Analysis

- Chi-square tests for bivariate associations with IDU sex partnerships and HIV infection
- Multiple logistic regression for factors associated with IDU/Unknown partnerships
- Personal network size included as independent variable in regression model
- Regression model controls for overall partner number
- Sensitivity analysis for misreported IDU history by removing those who were HCV-infected
Study Sample

Seeds
n=8

Recruits
n=1015

Eligible
n=850

Removed from Analysis

IDU
n=188

Not Tested
n=23

MSM
n=31

Reported HIV+
n=4

Analysis Group
n=601
## Demographics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td><strong>Age</strong></td>
</tr>
<tr>
<td>Male</td>
<td>18-29</td>
</tr>
<tr>
<td>Female</td>
<td>29-39</td>
</tr>
<tr>
<td></td>
<td>40-50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Race/Ethnicity</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>79%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>15%</td>
</tr>
<tr>
<td>White</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Other (Past Year)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeless</td>
<td>43%</td>
</tr>
<tr>
<td>Arrested</td>
<td>26%</td>
</tr>
</tbody>
</table>
Disease Outcomes

- HIV Infection: 7%
- HCV Infection: 4%
- Past Year STD Dx: 25%
Past Year HIV Risk Factors

- Risky Sex: 55%
- Crack Use: 27%
- No HIV Test: 64%
IDU Sex Partners

Past Year Partners
- IDU: 62%
- Unknown: 24%
- Non-IDU: 14%

Last Sex Partner
- IDU: 5%
- Unknown: 11%
- Non-IDU: 84%
## Factors Associated with IDU Sex Partnerships

<table>
<thead>
<tr>
<th></th>
<th>% IDU Partner</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>17%</td>
<td>1.8</td>
<td>1.1 - 2.9</td>
<td>0.03</td>
</tr>
<tr>
<td>&lt;10k Income</td>
<td>16%</td>
<td>1.9</td>
<td>1.1 - 3.2</td>
<td>0.02</td>
</tr>
<tr>
<td>Risky Sex</td>
<td>19%</td>
<td>2.9</td>
<td>1.7 - 5.0</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>STD Dx</td>
<td>19%</td>
<td>1.8</td>
<td>1.1 - 2.9</td>
<td>0.02</td>
</tr>
<tr>
<td>Crack Use</td>
<td>22%</td>
<td>2.4</td>
<td>1.5 - 3.8</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Marginal: No HIV Test (p=0.07)
## Bivariate Factors Associated with Undiagnosed HIV Infection

<table>
<thead>
<tr>
<th></th>
<th>% HIV+</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 40-50</td>
<td>12.3%</td>
<td>5.6</td>
<td>2.5 - 12.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>&lt;10k Income</td>
<td>8.8%</td>
<td>2.7</td>
<td>1.2 - 6.3</td>
<td>0.01</td>
</tr>
<tr>
<td>STD Dx</td>
<td>10.7%</td>
<td>2.0</td>
<td>1.0 - 3.7</td>
<td>0.04</td>
</tr>
<tr>
<td>HCV+</td>
<td>21.4%</td>
<td>4.1</td>
<td>1.6 - 10.7</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>IDU/Unk. Partners</td>
<td>11.0%</td>
<td>2.6</td>
<td>1.4 - 4.9</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
### Multiple Logistic Regression Model of Undiagnosed HIV Infection

<table>
<thead>
<tr>
<th></th>
<th>% HIV+</th>
<th>AOR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 40-50</td>
<td>12.3%</td>
<td>5.4</td>
<td>2.2 - 13.0</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>&lt;10k Income</td>
<td>8.8%</td>
<td>2.0</td>
<td>0.8 - 4.9</td>
<td>0.13</td>
</tr>
<tr>
<td>STD Dx</td>
<td>10.7%</td>
<td>1.4</td>
<td>0.7 - 3.0</td>
<td>0.36</td>
</tr>
<tr>
<td>HCV+</td>
<td>21.4%</td>
<td>2.0</td>
<td>0.7 - 5.9</td>
<td>0.19</td>
</tr>
<tr>
<td>IDU/Unk. Partners</td>
<td>11.0%</td>
<td>2.2</td>
<td>1.0 - 4.6</td>
<td>0.04</td>
</tr>
</tbody>
</table>
Follow-up Analyses

- No significant interaction between gender and IDU sex partnerships
- Ungrouped, those with IDU sex partners were marginally more likely to be infected in bivariate (p=0.07) and multivariate (p=0.14) tests
- Ungrouped, those with IDU sex partners were more likely to have a past year STD diagnosis (p<0.01)
- In sensitivity analysis removing HCV+ participants, main association remained similar
Summary

- One out of seven had a past year IDU partner
- Another one out of four had a partner with unknown IDU history
- IDU partnerships clustered with individual-level risk factors
- IDU/Unknown partnerships were associated with HIV infection after controlling for demographics and risks
- Undiagnosed HIV was very high
Discussion

- Recent study on the convergence of HIV rates for IDU and non-IDU in shared social networks
- IDU who inject safely still exhibit sexual risks
- Network-level risks are not always independent of individual-level risks
- IDU sex partnerships are a plausible heterosexual HIV risk for non-IDU in areas with large IDU populations
- Knowledge of IDU history is lower for historic partners
Limitations

- Cannot establish causality
- Did not measure other partner risk factors
- Report or recall bias on own and partners IDU history
- RDS-derived data may not be generalizable to the underlying population inside or outside of high-risk areas
Conclusions

- Network-level risk factors should be a continuing focus of heterosexual HIV research.
- Targeting non-IDU high-risk heterosexuals is necessary in era of declining injection drug use.
- Geographic and network-based method to target non-IDU is indicated.
- Promote disclosure of IDU history and HIV prevention (condoms, testing, treatment) with IDU partners.
References


