HIV Risk and Prevalence among Heterosexuals at Increased Risk for HIV in New York City: High-Risk Women

Results from the National HIV Behavioral Surveillance Study among High-Risk Women 2016
HIV among Persons with Heterosexual Risk\(^1\) in NYC, 2016

- 386 new diagnoses among persons with heterosexual risk in 2016
  
  *17% of all new diagnoses and 22% of new diagnoses with known risk*

- 24,383 people living with HIV/AIDS (PLWHA) with heterosexual risk as of 2016
  
  *20% of all PLWHA and 25% of PLWHA with known risk*

\(^1\)Includes persons who had heterosexual sex with a person they know to be HIV-infected, an injection drug user, or a person who has received blood products; for females only, also includes history of prostitution, multiple sex partners, sexually transmitted disease, crack/cocaine use, sex with a bisexual male, probable heterosexual transmission as noted in medical chart or sex with a male and negative history of injection drug use.
HIV among Females with Heterosexual Risk\(^1\) in NYC, 2016

- Among females, heterosexual transmission HIV case surveillance in NYC
  - 319 new heterosexual diagnoses in 2016
    - 63% of all new diagnoses and 84% of new diagnoses with known risk
  - 18,305 heterosexual PLWHA as of 2016
    - 53% of all PLWHA and 70% of PLWHA with known risk

- Heterosexual transmission risk assignment among women is complicated by requirements for multiple data points
  - Heterosexual transmission risks for individual women are often unknown (26% of newly diagnosed women had no risk assignment in 2016)

\(^1\)Includes persons who had heterosexual sex with a person they know to be HIV-infected, an injection drug user, or a person who has received blood products; for females only, also includes history of prostitution, multiple sex partners, sexually transmitted disease, crack/cocaine use, sex with a bisexual male, probable heterosexual transmission as noted in medical chart or sex with a male and negative history of injection drug use
Gender Disparities in Heterosexual HIV Transmission Risk in NYC

Heterosexual PLWHA and new heterosexual diagnoses are disproportionately female.
National HIV Behavioral Surveillance (NHBS)

- Ongoing, cyclical study of three HIV risk groups: MSM, IDU, and high-risk heterosexuals (HET)
  - Conducted in 20 cities through the U.S.
  - Funded by CDC, designed collaboratively
  - Cross-sectional study design
  - Anonymous, structured interview and HIV testing

- In NYC, the fourth HET cycle was restricted to high-risk women (HRW), focusing on women who exchange sex for money or drugs (NHBS-HET4 HRW).
NHBS Study Objectives

- Determine frequency and correlates of HIV risk behaviors
- Assess HIV testing history and patterns
- Assess exposure to and use of HIV prevention services
- Estimate the prevalence of HIV infection
- Understand trends in HIV risk and prevalence
NHBS-HET4 HRW Eligibility Criteria

- Female (not male or transgender)
- Vaginal or anal sex with a male sex partner in the past 12 months
- Aged 18-60 years old
- Resident of NYC metropolitan statistical area
- Speaks English or Spanish
Respondent-Driven Sampling

1. Study team recruits small number of initial participants (“seeds”) through community outreach
2. Seeds participate in the study then recruit up to 5 peers in their social networks
3. If eligible, those 5 peers participate and each recruits up to 5 more peers until sample size was met
   - Recruitment chains continually monitored to ensure demographic representativeness
   - In order to focus on women who exchange sex, women who did not exchange sex were not eligible to recruit. Those who were eligible to recruit were told to recruit women who exchange sex.
   - Incentives provided for participating in study and peer recruitment
• Each node represents a study participant. Linking lines show recruitment chains, initiated by 12 productive seeds (represented by circular nodes).

• To focus recruitment on women who exchange sex, those who did not report exchange sex in the past 12 months were not eligible to recruit other participants and are not shown in the diagram.
Statistical Analysis

- Unweighted analyses conducted with SAS 9.3
- Analyses restricted to non-seeds who reported exchange sex in past 12 months (n=330)
- Basic descriptive frequencies of demographics, risks, and use of HIV testing and prevention services
- Chi-square tests (categorical variables) and Wilcoxon tests (non-normal continuous variables) were used to compare differences in HIV risks and use of HIV testing and prevention services
- Self-reported HIV+ participants (n=75) removed from behavioral risk analyses; participants without a confirmed HIV result (n=5) excluded from prevalence analyses
NHBS-HET4 HRW Sample

Total Seeds n=31 → Eligible Seeds n=29 → Total Recruits n=505

Eligible Recruits n=436 → Reported Exchange Sex n=330 (76%)

HIV Tested n=328 (99%) → Confirmed HIV Result n=325 (99%)
### Demographics

*NYC NHBS-HET4 HRW, 2016, n=330 (Exchange Sex)*

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>18-29 6%</td>
</tr>
<tr>
<td>Hispanic/Latina</td>
<td>30-39 13%</td>
</tr>
<tr>
<td>White</td>
<td>40-49 26%</td>
</tr>
<tr>
<td>Other*</td>
<td>50+ 55%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; H.S. Grad</td>
<td>45%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Birthplace</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>88%</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>3%</td>
</tr>
<tr>
<td>Foreign</td>
<td>8%</td>
</tr>
</tbody>
</table>

*‘Other’ category includes American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander*
## Demographics

*NYC NHBS-HET4 HRW, 2016, n=330 (Exchange Sex)*

### Marital Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Married</td>
<td>65%</td>
</tr>
<tr>
<td>Currently Married or Cohabiting</td>
<td>7%</td>
</tr>
<tr>
<td>Previously Married</td>
<td>28%</td>
</tr>
</tbody>
</table>

### Homeless\(^1\)

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past 12 mos.</td>
<td>50%</td>
</tr>
<tr>
<td>Currently</td>
<td>27%</td>
</tr>
</tbody>
</table>

### Criminal Justice

<table>
<thead>
<tr>
<th>Incarcerated (12m)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>18%</td>
</tr>
</tbody>
</table>

### Household Income (12m)

<table>
<thead>
<tr>
<th>Income Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$10k/year</td>
<td>52%</td>
</tr>
</tbody>
</table>

\(^1\)Defined as living on the street, in a shelter, in a Single Room Occupancy (SRO), or in a car.
Most Common Modality of Exchange Sex in Past 12 Months

NYC NHBS-HET4 HRW, 2016, n=330 (Exchange Sex)

1. The most common way the participant found men to exchange sex with
Sexual Behaviors
Type of Sexual Partnerships\(^1\) in Past 12 Months

*NYC NHBS-HET4 HRW, 2016, n=255 (Exchange Sex, HIV-/Unknown Status)*

<table>
<thead>
<tr>
<th>Type of Partner</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Partner (^2)</td>
<td>69%</td>
</tr>
<tr>
<td>Casual Partner (^3)</td>
<td>98%</td>
</tr>
<tr>
<td>Female Partner</td>
<td>60%</td>
</tr>
</tbody>
</table>

\(^1\) Oral, vaginal, or anal sex

\(^2\) Someone who the participant feels committed to above anyone else

\(^3\) Someone who the participant does not feel committed to or does not know very well
<table>
<thead>
<tr>
<th></th>
<th>Total (n=255)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>Main²</td>
<td>1</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>Casual³ (Non-Exchange)</td>
<td>0</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Casual Exchange⁴</td>
<td>4</td>
<td>39.3</td>
<td></td>
</tr>
<tr>
<td>Any Exchange</td>
<td>6</td>
<td>39.5</td>
<td></td>
</tr>
<tr>
<td>All Types</td>
<td>6</td>
<td>42.2</td>
<td></td>
</tr>
</tbody>
</table>

¹Oral, vaginal, or anal sex
²Someone who the participant feels committed to above anyone else
³Someone who the participant does not feel committed to or does not know very well
⁴Casual partner who gave money or drugs in exchange for sex
Past 12 Month Sexual Risk Behavior by Male Partner Type

NYC NHBS-HET4 HRW, 2016, n=255 (Exchange Sex, HIV-/Unknown Status)

- Condomless Vaginal Sex: 92% Any Partner, 75% Exchange Partner
- Condomless Anal Sex: 50% Any Partner, 38% Exchange Partner
- Condomless Vaginal/Anal Sex: 93% Any Partner, 76% Exchange Partner
Past 12 Month Sexual Risk Behavior with Male Partners by Participants’ Race/Ethnicity

NYC NHBS-HET4 HRW, 2016, n=250 (Exchange Sex, HIV-/Unknown Status)¹

<table>
<thead>
<tr>
<th></th>
<th>Hispanic/Latina</th>
<th>Black</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condomless Vaginal Sex</td>
<td>94%</td>
<td>91%</td>
<td>93%</td>
</tr>
<tr>
<td>Condomless Anal Sex</td>
<td>55%</td>
<td>45%</td>
<td>64%</td>
</tr>
<tr>
<td>Condomless Vaginal/Anal</td>
<td>95%</td>
<td>92%</td>
<td>93%</td>
</tr>
</tbody>
</table>

¹‘Other’ race (American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander) not shown due to small sample size
Past 12 Month Sexual Risk Behavior by Participants’ Race/Ethnicity

NYC NHBS-HET4 HRW, 2016, n=250 (Exchange Sex, HIV-/Unknown Status)¹

11% 70% 70% 11% 64% 79% 79% 65%

Condomless Sex with HIV+ Condomless Sex with Unknown Status Condomless Sex with HIV+/Unknown Status

Hispanic/Latina Black White

Other’ race (American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander) not shown due to small sample size
Sexual Risk Behavior at Last Sex by Male Partner Type

NYC NHBS-HET4 HRW, 2016, n=255 (Exchange Sex, HIV-/Unknown Status)

- Condomless Vaginal Sex: 81% (Non-Exchange) vs. 75% (Exchange)
- Condomless Anal Sex: 16% (Non-Exchange) vs. 27% (Exchange)
- Condomless Vaginal/Anal Sex: 81% (Non-Exchange) vs. 76% (Exchange)
Sexual Risk Behavior at Last Sex by Participants’ Race/Ethnicity

NYC NHBS-HET4 HRW, 2016, n=250 (Exchange Sex, HIV-/Unknown Status)

Condomless Vaginal Sex
- Hispanic/Latina: 76%
- Black: 79%
- White: 71%

Condomless Anal Sex
- Hispanic/Latina: 24%
- Black: 25%
- White: 18%

Condomless Vaginal/Anal Sex
- Hispanic/Latina: 77%
- Black: 79%
- White: 71%

1‘Other’ race (American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander) not shown due to small sample size
Risk Characteristics of Last Male Partner by Partner Type

NYC NHBS-HET4 HRW, 2016, n=255 (Exchange Sex, HIV-/Unknown Status)

- Partner HIV+/Unknown Status: 45% (Non-Exchange) vs. 65% (Exchange) (p=0.006)
- Partner Ever IDU: 22% (Non-Exchange) vs. 33% (Exchange)
- Partner Ever Used Crack: 61% (Non-Exchange) vs. 56% (Exchange)
- Partner Ever Incarcerated: 81% (Non-Exchange) vs. 62% (Exchange) (p=0.005)
- Partner Ever Had Sex with Men: 9% (Non-Exchange) vs. 18% (Exchange)
Risk Characteristics of Last Male Partner by Participants’ Race/Ethnicity

NYC NHBS-HET4 HRW, 2016, n=250 (Exchange Sex, HIV-/Unknown Status)

1\{"Other\’ race (American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander) not shown due to small sample size\}
Substance Use
Drug Use History

NYC NHBS-HET4 HRW, 2016, n=330 (Exchange Sex)
Non-Injection Drug Use in Past 12 Months

NYC NHBS-HET4 HRW, 2016, n=330 (Exchange Sex)
Alcohol Use in Past 30 Days

NYC NHBS-HET4 HRW, 2016, n=330 (Exchange Sex)

- Any Drinking: 77%
- Any Binge Drinking: 58%

14 or more drinks in one sitting
Sexually Transmitted Diseases
Self-Reported Sexually Transmitted Disease (STD) Testing and Diagnosis in Past 12 Months by Participants’ Race/Ethnicity

NYC NHBS-HET4 HRW, 2016, n=250 (Exchange Sex, HIV-/Unknown Status)

<table>
<thead>
<tr>
<th>Tested for any STD</th>
<th>Syphilis Diagnosis</th>
<th>Chlamydia Diagnosis</th>
<th>Gonorrhea Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic/Latina</td>
<td>62%</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Black</td>
<td>56%</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>White</td>
<td>61%</td>
<td>0%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Other’ race (American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander) not shown due to small sample size
Self-Reported Sexually Transmitted Disease (STD) Diagnosis in Lifetime by Participants’ Race/Ethnicity

NYC NHBS-HET4 HRW, 2016, n=250 (Exchange Sex, HIV-/Unknown Status)

1 Other’ race (American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander) not shown due to small sample size
HIV Prevention Behaviors
Perceived HIV Risk by Past 12 Month Risk Behavior

NYC NHBS-HET4 HRW, 2016, n=255 (Exchange Sex, HIV-/Unknown Status)

- Overall: 29% Low, 25% Medium, 46% High
- Condomless Sex w/ HIV+/Unknown Partner: 40% Low, 24% Medium, 36% High
- Self-Reported STD Diagnosis\(^1\): 40% Low, 19% Medium, 41% High
- IDU: 32% Low, 42% Medium, 26% High

\(^1\)Includes chlamydia, gonorrhea, or syphilis diagnosis
HIV Testing History among Women Who Exchange Sex Compared to Other High-Risk Groups

NYC NHBS MSM (2014), IDU (2015), and HRW (2016); HIV-/Unk. Status

Ever Tested
- MSM: 96%
- IDU: 99%
- HRW: 90%

Tested in Past Year
- MSM: 34%
- IDU: 79%
- HRW: 81%
- Other: 55%
HIV Testing History Among HRW by Race/Ethnicity

NYC NHBS-HET4 HRW, 2016, n=250 (Exchange Sex, HIV-/Unknown Status)¹

Ever Tested
- Hispanic/Latina: 94%
- Black: 87%
- White: 93%

Tested in Past Year
- Hispanic/Latina: 56%
- Black: 52%
- White: 64%

¹‘Other’ race (American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander) not shown due to small sample size
Medical Visits and HIV Testing in Past 12 Months by Participants’ Race/Ethnicity

NYC NHBS-HET4 HRW, 2016, n=250 (Exchange Sex, HIV-/Unknown Status)

1 Other race (American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander) not shown due to small sample size
2 Of those who visited a medical provider
Offered HIV Test by Medical Provider by Past 12 Month Risk Behavior

NYC NHBS-HET4 HRW, 2016, n=233 (HIV-/Unk., Visited Med. Provider in past 12m)

Overall Condomless Sex with HIV+/Unknown Partner

Self-reported STD Diagnosis\(^1\)

IDU

\(^1\)Includes chlamydia, gonorrhea, or syphilis diagnosis
HIV Prevention Engagement in Past 12 Months by Participants’ Race/Ethnicity

NYC NHBS-HET4 HRW, 2016, n=250 (HIV-/Unknown Status)

- **Received Free Condoms**
  - Hispanic/Latina: 72%
  - Black: 72%
  - White: 68%

- **Any HIV Prevention Counseling**
  - Hispanic/Latina: 37%
  - Black: 49%
  - White: 54%

1 'Other’ race (American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander) not shown due to small sample size
Pre-Exposure Prophylaxis (PrEP) Awareness and Utilization in Past 12 Months

NYC NHBS-HET4 HRW, 2016, n=255 (HIV-/Unknown Status)

- 29% Heard of PrEP
- 34% Discussed taking PrEP w/ Provider
- 8% Took PrEP
- 2% Took PrEP Among all

Among those who heard of PrEP
## HIV Prevalence

*NYC NHBS-HET4 HRW, 2016, n=325 (Confirmed HIV result)*

<table>
<thead>
<tr>
<th></th>
<th>HIV-Positive</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall</strong></td>
<td>34.5%</td>
<td>29.3%-39.9%</td>
<td></td>
</tr>
<tr>
<td><strong>Lifetime Risks</strong></td>
<td></td>
<td></td>
<td>0.02</td>
</tr>
<tr>
<td>HET only</td>
<td>38.4%</td>
<td>32.1%-45.1%</td>
<td></td>
</tr>
<tr>
<td>HET &amp; IDU</td>
<td>25.0%</td>
<td>16.7%-34.9%</td>
<td></td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
<td>0.0008</td>
</tr>
<tr>
<td>Hispanic/Latina</td>
<td>28.7%</td>
<td>20.2%-38.6%</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>42.1%</td>
<td>35.0%-49.5%</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>6.9%</td>
<td>0.9%-22.8%</td>
<td></td>
</tr>
</tbody>
</table>
## HIV Prevalence

*NYC NHBS-HET4 HRW, 2016, n=325 (Confirmed HIV result)*

<table>
<thead>
<tr>
<th>Age</th>
<th>HIV-Positive</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>34.5%</td>
<td>29.3%-39.9%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>18-29</td>
<td>5.3%</td>
<td>0.1%-26.0%</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>16.3%</td>
<td>6.8%-30.7%</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>29.4%</td>
<td>20.0%-40.2%</td>
<td></td>
</tr>
<tr>
<td>50-60</td>
<td>44.4%</td>
<td>37.0%-52.0%</td>
<td></td>
</tr>
</tbody>
</table>
Summary

• Special NHBS study successfully sampled women who exchange sex with multiple types of modalities and risks
• Many participants experienced poverty, homelessness, and incarceration
• Most participants reported drug or alcohol use
Summary (Cont’d)

• Participants reported high numbers of recent sexual partners and most reported condomless sex

• Sexual partnerships with high-risk partners (HIV+/unknown status, people who inject drugs, previously incarcerated, MSM) were frequent
  – Exchange sex partners at last sex were more frequently of HIV+/unknown status and less frequently had a history of incarceration

• No racial/ethnic differences were found in recent sexual risk, partnerships, or STD diagnoses
Summary (Cont’d)

• Compared to MSM & IDU in past NHBS cycles, HRW have lower levels of recent HIV testing despite high levels of risk
  – Slightly more than half of those visiting a medical provider were offered an HIV test by the provider
  – Offers of HIV testing did not vary by HIV risk factors
  – Low uptake may be due to low levels of perceived HIV risk

• Most participants received free condoms in the past 12 months, but less than half reported receiving HIV prevention counseling

• Awareness of PrEP was low and very few participants reported taking PrEP in the past 12 months
Summary (Cont’d)

• Overall HIV prevalence was much higher than in the general population
  – HIV prevalence varied by lifetime risk factors; those who had never injected drugs had higher prevalence than those who had
  – HIV prevalence was higher among those who were older and among Black participants

• The high HIV prevalence may not be generalizable to the population. Higher than expected prevalence could be due to:
  • Strong networks and high homophily among known HIV+ women (women who were known HIV+ were more likely to recruit other women who are HIV+)
  • The sampling of a population who were diagnosed (median year of dx=1995) when HIV prevalence was high (12%-30%) among certain subgroups of women in NYC (Chiasson et al., 1991; Edlin et al., 1994; Tortu et al., 1998) or from higher HIV prevalence subgroups (Ompad et al., 2011; Des Jarlais et al., 2014; El-Bassel et al., 2017).
Strengths

• Dataset with information on multiple HIV risk factors
• Standardized survey and protocol
• Extensive formative research to support data collection
• RDS can reach “hidden” populations for which no sampling frame exists
Limitations

• Methodological assumptions of RDS most likely not met due to high homophily according to HIV status; RDS-based estimates (which are generalizable to the population) were not calculated

• All data except HIV serostatus were collected by self-report, and may be biased by recall error or social desirability and self-selection

• Lack of lifetime risk factors (i.e., crack use), which may help explain the high prevalence identified

• Subgroups of women who exchange sex not fully represented (i.e., brothel/massage parlor workers; escorts; women who do not speak English/Spanish) due to recruitment challenges and survey language
References

NYC National HIV Behavioral Surveillance Team - HRW

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CDC
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