Potential transmission risk and prevention in HIV patients receiving care: results from the Medical Monitoring Project

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Background
Medical Monitoring Project (MMP)

- In the USA, at the end of 2006, there were an estimated 1.1 million people living with HIV/AIDS (PLWHA) (MMWR, 2008)
- In NYC, at the end of 2009, there were an estimated 108,886 PLWHA (NYC DOHMH, 2010)
- MMP is a national study of PLWHA receiving medical care for HIV
- Conducted by the Centers for Disease Control and Prevention (CDC) with local partners
Objectives
Medical Monitoring Project (MMP)

- To develop greater understanding of the health status and health-related needs of PLWHA, and their HIV transmission risk and prevention
- Data driven based on locally and nationally representative samples of HIV infected adults in care
- Can inform the development and planning of policy and programs for PLWHA, e.g. Ryan White CARE Act planning councils and consortia
Methods
Medical Monitoring Project (MMP)

- Multi-year (2005-open) project of US adults in outpatient care for HIV
- Cross-sectional design
- Annual multi-stage probability sample
Method
Medical Monitoring Project (MMP): 3-stage Sample Design

1st stage – local areas

2nd stage - providers

3rd stage - patients
Methods
Medical Monitoring Project (MMP): Sample Selection

• Stage 1 – Local Areas:
  - 26 areas selected (20 states and 6 cities)
  - Includes >80% of US AIDS cases
  - Probability of selection is proportional to size (PPS) (# of AIDS cases in 2002)
Methods
Medical Monitoring Project (MMP): Sample Selection

- Stage 2 – Medical Providers (facilities or private providers):
  - Providers who deliver HIV medical care
    - Monitor CD4 count, viral load
    - Rx ART
Methods
Medical Monitoring Project (MMP): Sample Selection

- Stage 3 – Patients seen by a Selected Provider
  - Randomly sampled
  - Eligibility
    - HIV-infected
    - ≥ 18 years of age
    - received HIV medical care at facility 1/1 – 4/30 in a given cycle year
  - Participation is voluntary and in NYC requires informed consent
  - Patient incentive for participation ($40 in transit cards)
Methods
Medical Monitoring Project (MMP)

• Data collection using 2 sources:
  – Computer-based structured interview, face-to-face by trained interviewer, conducted in private
  – Medical record abstractions

• Data collected:
  – Clinical status
  – Treatment adherence
  – Service utilization
  – HIV-related service needs
  – Health behaviors (health care utilization, sexual, drug use, prevention)
NYC 2007 and 2008 MMP Sample

Facility Sampling Frame
N=489

Facility sample selected
N=34

Facilities agreeing to participate N=25
Facilities participating in data collection N=21

2007 Facility Sample
N=800

2007 Interviews* completed (with complete data)
N=279

2008 Facility Sample
N=752

2008 Interviews** completed (with complete data)
N=234

Analysis sample, total number of merged 2007-2008 interviews
N=513

* Interviews were conducted January-July 2008

** Interviews were conducted January-July 2009
MMP Participants' Social Demographics
Participants’ Social Demographics (N=513)
MMP, NYC, 2007/2008

(Mean age = 45.5 years, SD = 9.6, range 21-74)
MMP Participants' Clinical Characteristics
Participants' Health Status by Race/Ethnicity
CD4 Count < 200 and Undetectable Viral Load (most recent in last 12 months)
MMP, NYC, 2007/2008

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>CD4 Count &lt; 200 (in last 12 months)</th>
<th>Undetectable Viral Load (in last 12 months)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black (N=200)</td>
<td>12.5%</td>
<td>54.5%</td>
</tr>
<tr>
<td>Hispanic (N=195)</td>
<td>8.2%</td>
<td>51.8%</td>
</tr>
<tr>
<td>White (N=80)</td>
<td>3.8%</td>
<td>72.5%</td>
</tr>
<tr>
<td>Other (N=38)</td>
<td>7.9%</td>
<td>55.3%</td>
</tr>
<tr>
<td>Total (N=513)</td>
<td>9.2%</td>
<td>56.3%</td>
</tr>
</tbody>
</table>

* p < 0.01
Antiretroviral Treatment (ART) and Adherence
MMP, NYC, 2007/2008

- Ever taken ART: 447 (87.1%) out of 513
- Currently on ART: 423 (82.5%) out of 513
- Missed ART Dose: 63 (14.9%) out of 423 currently on ART
Recent CD4 Count < 200 and Undetectable Viral Load by Missed ART Dose
MMP, NYC, 2007/2008

CD4 count < 200

<table>
<thead>
<tr>
<th></th>
<th>Yes, missed</th>
<th>No, did not miss</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 56</td>
<td>27.0%</td>
<td>8.1%</td>
</tr>
</tbody>
</table>

Undetectable Viral Load

<table>
<thead>
<tr>
<th></th>
<th>Yes, missed</th>
<th>No, did not miss</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 48</td>
<td>58.3%</td>
<td>81.7%</td>
</tr>
</tbody>
</table>

(Of 353 who knew their CD4 count)  
\[ p < 0.0001 \]

(Of 348 who knew their viral load)  
\[ p < 0.0001 \]
Sexual Activity and Sexual Risk Behaviors
Sexually Active Status by Gender (Last 12 months)
MMP, NYC, 2007/2008

- **All**: 30.0% Same-Sex Only, 29.8% Heterosexual Only, 2.5% Both, 0.7% Not Active
- **Male**: 44.3% Same-Sex Only, 22.1% Heterosexual Only, 2.2% Both, 3.6% Not Active
- **Female**: 24.5% Same-Sex Only, 51.2% Heterosexual Only, 0.7% Both, 66.7% Not Active
- **Trans**: 33.3% Same-Sex Only, 51.4% Heterosexual Only, 2.2% Both, 66.7% Not Active
Partner Gender Among the Sexually Active (N=359) MMP, NYC, 2007/2008

Male Participants (N = 277)
- Male sex partners only: 67.9%
- Female sex partners only: 29.2%
- Both: 2.9%

Female Participants (N = 78)
- Male sex partners only: 92.3%
- Female sex partners only: 6.4%
- Both: 1.3%

Transgender Participants (N=4)
- Any gender partner: 100%
Sexual Behaviors among Sexually Active Male Participants by Partnership Gender (past 12 months)
MMP, NYC, 2007/2008

Male Sex Partner (n=196)
- Any Anal: 172 (87.8%)
- Any unprotected anal: 92 (46.9%)

Female Sex Partner (n=89)
- Any vaginal: 79 (88.8%)
- Any unprotected vaginal: 21 (23.6%)
- Any anal: 17 (19.1%)
- Any unprotected anal: 6 (6.7%)
- Any unprotected anal or vaginal: 21 (23.6%)
Sexual Behaviors among Sexually Active Female Participants by Partnership Gender (past 12 months)
MMP, NYC, 2007/2008

Male Sex Partner (n=69)

- Any vaginal: 66 (95.7%)
- Any unprotected vaginal: 33 (47.8%)
- Any anal: 9 (13.0%)
- Any unprotected anal: 4 (5.8%)
- Any unprotected anal or vaginal: 33 (47.8%)
Sexual Behaviors with Last Sex Partner
Male Participants’ Sexual Activities
Unprotected Anal Sex (UAS) with Last Male Sex Partner by HIV Status of Partner
MMP, NYC, 2007/2008

Engaged in UAS with last sex partner

Male Participants
Male Sex Partner*
(n=196)

HIV Status of Last Sex Partner

<table>
<thead>
<tr>
<th>HIV Status of Last Sex Partner</th>
<th>Total (n=196)</th>
<th>HIV+</th>
<th>HIV-</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV+</td>
<td>64 (32.7%)</td>
<td>42 (50.0%)</td>
<td>9 (17.7%)</td>
<td>13 (21.3%)</td>
</tr>
<tr>
<td>HIV-</td>
<td>51 (26.0%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>61 (31.1%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p <0.0001
Male Participants’ Sexual Activities
Unprotected Anal Sex (UAS) or Unprotected Vaginal Sex (UVS) with Last Female Sex Partner by HIV Status of Partner
MMP, NYC, 2007/2008

<table>
<thead>
<tr>
<th>HIV Status of Last Sex Partner</th>
<th>Total (n=89)</th>
<th>HIV+</th>
<th>HIV-</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV+</td>
<td>18 (20.2%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV-</td>
<td>8 (23.5%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>7 (15.9%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3 (27.3%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Male Participants
Female Sex Partner
(n=89)
Female Participants’ Sexual Activities

Unprotected Anal Sex (UAS) or Unprotected Vaginal Sex (UVS) with Last Male Sex Partner by HIV Status of Partner

MMP, NYC, 2007/2008

<table>
<thead>
<tr>
<th>HIV Status of Last Sex Partner</th>
<th>Total (n=69)</th>
<th>HIV+</th>
<th>HIV-</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV+</td>
<td>23 (33.3%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV-</td>
<td>8  (38.1%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>9  (25.7%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV Status of Last Sex Partner</td>
<td>35 (50.7%)</td>
<td>13 (18.8%)</td>
<td>21 (30.4%)</td>
<td></td>
</tr>
</tbody>
</table>

Engaged in UAS or UVS with last sex partner
Substance Use and Unprotected Sex
Drug and Alcohol Use
MMP, NYC, 2007/2008

(N=513)

Injection Drug use (Ever)
102 (19.9%)

Non-Injection Drug Use (Past 12 Months)
207 (40.4%)

Alcohol Use (Past 12 Months)
269 (52.4%)
Non-Injection Drug Use and Binge Alcohol Drinking
MMP, NYC, 2007/2008

(N=513)
Substance Use and Unprotected Sex (statistically significant)
MMP, NYC, 2007/2008

% = engaged in unprotected sex

<table>
<thead>
<tr>
<th>Drug</th>
<th>Yes (did use drugs)</th>
<th>No (did not use drugs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>46.0%</td>
<td>31.9%</td>
</tr>
<tr>
<td>Powder Cocaine</td>
<td>68.4%</td>
<td>35.4%</td>
</tr>
<tr>
<td>Crystal Meth</td>
<td>80.6%</td>
<td>36.2%</td>
</tr>
<tr>
<td>Marijuana</td>
<td>56.6%</td>
<td>31.7%</td>
</tr>
<tr>
<td>Poppers</td>
<td>74.6%</td>
<td>34.0%</td>
</tr>
<tr>
<td>Ecstasy</td>
<td>75.0%</td>
<td>38.6%</td>
</tr>
<tr>
<td>Special K</td>
<td>77.8%</td>
<td>39.7%</td>
</tr>
</tbody>
</table>

NYC Health
Exposure to Individual Counseling or Group Prevention
Sexually Active Participants and Exposure to Prevention in the Past 12 Months (N=359) (2007-2008 Sample)

- **Received any free condoms**
  - Yes (87.7%)
  - No (12.3%)

- **Talked with a counselor (one-on-one) about HIV prevention**
  - Yes (32.3%)
  - No (67.7%)

- **Participated in group sessions to talk about HIV prevention**
  - Yes (23.1%)
  - No (76.9%)

- **Participated in group sessions or talked with a counselor about HIV prevention**
  - Yes (42.3%)
  - No (57.7%)
Exposure to Prevention in the Past 12 Months and Unprotected Vaginal or Anal Sex (2007-2008 Sexually Active Sample, N=359)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neither</td>
<td>207</td>
<td>57.7%</td>
</tr>
<tr>
<td>Only Counselor</td>
<td>69</td>
<td>19.2%</td>
</tr>
<tr>
<td>Only Group</td>
<td>36</td>
<td>10.0%</td>
</tr>
<tr>
<td>Both Counselor and Group</td>
<td>47</td>
<td>13.1%</td>
</tr>
</tbody>
</table>

(\% = engaged in unprotected sex)

\(p < 0.08\)

(\% exposed to type of prevention among sexually active)
Exposure to Prevention and Unprotected Sex (2007 sample)
Sexually Active Participants and Exposure to Prevention (Past 12 Months (N=197))

Received any free condoms
- Yes (89.9%)
- No (10.2%)

Talked with a counselor (one-on-one) about HIV prevention
- Yes (38.6%)
- No (61.4%)

Participated in group sessions to talk about HIV prevention
- Yes (24.9%)
- No (75.1%)

Counselor or group sessions
- Yes (49.2%)
- No (50.8%)
### Sexually Active Participants and Prevention Content (one-on-one or group setting) (N=197)

<table>
<thead>
<tr>
<th>Setting</th>
<th>Discussing or Practicing Ways to Talk to Partner About Safe Sex</th>
<th>Discussing or Practicing Effective Condom Use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One-on-One Counseling</strong></td>
<td><img src="Image" alt="Graph" /></td>
<td><img src="Image" alt="Graph" /></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes 34.5%</td>
<td>Yes 32.0%</td>
</tr>
<tr>
<td>No</td>
<td>65.5%</td>
<td>68.0%</td>
</tr>
<tr>
<td><strong>Group Setting</strong></td>
<td><img src="Image" alt="Graph" /></td>
<td><img src="Image" alt="Graph" /></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes 22.3%</td>
<td>Yes 22.3%</td>
</tr>
<tr>
<td>No</td>
<td>77.7%</td>
<td>77.7%</td>
</tr>
</tbody>
</table>
Engaging in Unprotected Sex and Exposure to Prevention (N=197)

Unprotected Sex by Prevention Exposure Through One-on-One Counseling

<table>
<thead>
<tr>
<th></th>
<th>Yes (n=68)</th>
<th>No (n=129)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussing or Practicing Ways to Talk to a Partner About Safe Sex</td>
<td>48.1%</td>
<td>32.4%</td>
</tr>
<tr>
<td>Discussing or Practicing Effective Condom Use</td>
<td>47.0%</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

p < 0.05

Unprotected Sex by Prevention Exposure Through a Group Session

<table>
<thead>
<tr>
<th></th>
<th>Yes (n=44)</th>
<th>No (n=153)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussing or Practicing Ways to Talk to a Partner About Safe Sex</td>
<td>46.4%</td>
<td>29.6%</td>
</tr>
<tr>
<td>Discussing or Practicing Effective Condom Use</td>
<td>47.7%</td>
<td>25.0%</td>
</tr>
</tbody>
</table>

p < 0.05

NYC Health
Engaging in Unprotected Sex and Receiving Free Condoms (N=197)

Unprotected Sex by Receiving Free Condoms

- Yes (n=177): 41.8%
- No (n=20): 50.0%
Summary 1 (potential transmission risk)

- The majority (70%) were sexually active
  - half of sexually active MSM engaged in unprotected anal sex
  - half of sexually active women and a quarter of sexually active men engaged in unprotected heterosexual sex
  - half or greater reported last sex partners with unknown or negative HIV status

- Alcohol use and non-injection drug use common

- Alcohol and drug use (esp. stimulant drugs) increased the risk of unprotected sex
Most had received free condoms

~ half of the sexually active had received individual or group counseling

Those receiving both individual and group counseling tended to be less likely to engage in unprotected sex

Receiving more specific interventions, e.g., practicing how to use condoms, was associated with a lower risk of unprotected sex (2007 sample)

Those receiving free condoms (vs. those who did not) were not significantly less likely to have engaged in unprotected sex (2007 sample)

MSM, but not those engaging in heterosexual sex, may have been more likely to have practiced “serosorting”
Summary 3 (medical intervention)

- HIV transmission efficiency may be decreased through lower viral loads as a consequence of adherence to ART regimens
- Promoting early use and adherence to ART may reduce HIV incidence
Conclusion

- There is substantial potential for the sexual transmission of HIV among HIV positives receiving care in NYC.

- Prevention with positives is likely to require a spectrum of modalities (condom distribution, intensive individual or group interventions, alcohol and drug misuse treatment, and adherence to ART).

- Since this population is in care, HIV care settings could be used to implement interventions to prevent HIV transmission.
References


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