EPIDEMIOLOGY OF HIV AMONG MSM IN AFRICA:
Implications for Rectal Microbicides

IAS 2009 Satellite Session
Rectal Microbicide Development-An African Perspective
Sunday, 19 July

Chris Beyrer, MD, MPH
Johns Hopkins Bloomberg School of Public Health
Overview

- Introduction
- Risk Factors for HIV Infection among MSM
  - Individual
  - Structural
- HIV Prevalence and Risk data among African MSM
- Anal Sex and Lubricant use
  - Implications for microbicides
- Conclusions
Introduction

- HIV epidemic spread among MSM is occurring in both high and low income settings in 2009

- Lower income HIV epidemics among MSM are underway in Latin America, Asia, Eastern Europe/FSU, and Africa

- Many HIV epidemics in lower income settings among MSM are occurring in “hidden” contexts of discrimination, stigma, criminalization, and limited HIV surveillance

- MSM in Africa among the least studied, but data are emerging
Individual Risk factors for MSM

- Unprotected anal intercourse (↑ risk with receptive UAI)
- High frequency of male partners (>3 sexual contacts/week)
- High number of lifetime male partners (>10)
- Injection drug use
- (lack of circumcision—data are equivocal)

- Non-injection drug use
- Methamphetamines

Mediated through increased sexual exposure

Beyrer, C. STD, 2007
Criminalization and stigma limit MSM access to HIV prevention, treatment and care

MSM understudied in many emerging HIV epidemic contexts
- Not included in national HIV surveillance in majority of low and middle income countries

As of 2009, relatively few countries have published data characterizing MSM risk and HIV rates

Fewer than 1 in 10-20 MSM worldwide have access to necessary prevention services
- This is markedly lower in the African Context

Beyrer, C. STD, 2007
MSM in Africa

- Increasing amount of information available over the last few years
  - Risk Status
    - Reports from Ghana, Nigeria, Zambia, Tanzania, Uganda, Kenya, Senegal, Ethiopia describe high rates of UAI and a population in need of basic interventions
  - Sexual Identity
    - Recent reports from Kenya and Uganda describe a more visible (reachable) and demographically diverse population than a decade ago

## Systematic Review of HIV among MSM in Low and Middle Income Countries (2007)

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Countries</th>
<th>Odds Ratios</th>
<th>95% Confidence Interval</th>
<th>MSM Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America</td>
<td>15</td>
<td>33.3</td>
<td>32.3-34.2</td>
<td>16.1 (15.1-17.0)</td>
</tr>
<tr>
<td>Asia</td>
<td>7</td>
<td>18.7</td>
<td>17.7-19.7</td>
<td>11.4 (10.1-12.7)</td>
</tr>
<tr>
<td>Africa</td>
<td>4</td>
<td>3.8</td>
<td>3.3-4.3</td>
<td>13.0 (10.6-18.1)</td>
</tr>
</tbody>
</table>

- MSM are at high risk for being HIV infected across the lower and middle income countries of Latin America, Asia, and Africa.
- Even in generalized epidemics of Africa, MSM are still at significantly increased risk of HIV infection.

## HIV Prevalence Rates Among MSM West Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>Sample Size</th>
<th>MSM Prevalence (95% CI)</th>
<th>Reproductive Age Male HIV Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senegal</td>
<td>943</td>
<td>21.6 (19.0-24.3)</td>
<td>0.7%</td>
</tr>
<tr>
<td>Ghana</td>
<td>N/A</td>
<td>25.0%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Nigeria</td>
<td>1961</td>
<td>13.5 (12.0-15.0)</td>
<td>2.4%</td>
</tr>
<tr>
<td>Mauritania</td>
<td>21</td>
<td>19.0% (2.0-36.0)</td>
<td>1.2%</td>
</tr>
<tr>
<td>Cote D’Ivoire</td>
<td>54</td>
<td>18.5%</td>
<td>2.9%</td>
</tr>
</tbody>
</table>

HIV Prevalence Rates Among MSM East Africa/ North Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>Sample Size</th>
<th>MSM Prevalence (95% CI)</th>
<th>Reproductive Age Male HIV Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>1125</td>
<td>15.6 (13.5-17.7)</td>
<td>7.49%</td>
</tr>
<tr>
<td>Tanzania</td>
<td>509</td>
<td>12.4 (9.5-15.2)</td>
<td>5.88%</td>
</tr>
<tr>
<td>Uganda</td>
<td>19</td>
<td>42.1%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Sudan</td>
<td>1119</td>
<td>8.8 (7.1-10.4)</td>
<td>1.26%</td>
</tr>
<tr>
<td>Egypt</td>
<td>340</td>
<td>5.3 (2.9-7.7)</td>
<td>0.02%</td>
</tr>
</tbody>
</table>
## HIV Prevalence Rates Among MSM Southern Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>Sample Size</th>
<th>MSM Prevalence (95% CI)</th>
<th>Reproductive Age Male HIV Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>574</td>
<td>15.3 (12.4-18.3)</td>
<td>15.89%</td>
</tr>
<tr>
<td>Zambia</td>
<td>641</td>
<td>32.9 (29.3-36.6)</td>
<td>15.72%</td>
</tr>
<tr>
<td>Malawi</td>
<td>201</td>
<td>21.4 (15.7-27.1)</td>
<td>11.46%</td>
</tr>
<tr>
<td>Namibia</td>
<td>218</td>
<td>12.4% (9.0-17.0)</td>
<td>10.8%</td>
</tr>
<tr>
<td>Botswana</td>
<td>117</td>
<td>19.7% (14.0-28.0)</td>
<td>18.1%</td>
</tr>
</tbody>
</table>
HIV Incidence Rates

- African HIV incidence data is available only from Mombasa, Kenya
- Among MSM who report:
  - Insertive sex only
    - 8.8 %/person-year
  - Receptive sex only
    - 12.9 % per person-year
  - Both receptive and insertive sex it is
    - 20.4 % per person years
Risk Factors for HIV among MSM in Africa

- Self-reporting as homosexual
  - Likely a marker of sexual positioning
- Not always wearing condoms with men
- Having been diagnosed with an STI
- Had Transactional Sex
- Used alcohol with sex
- Older Age
  - Not new epidemics among younger men
- Ever Arrested
- Ever Raped

### Human Rights Contexts
**Malawi, Namibia, Botswana**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Malawi</th>
<th>Namibia</th>
<th>Botswana</th>
<th>Pooled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denied housing other than not being able to pay</td>
<td>6.5%</td>
<td>8.3%</td>
<td>5.2%</td>
<td><strong>6.9% (37/534)</strong></td>
</tr>
<tr>
<td>Denied health care based on sexuality</td>
<td>4.0%</td>
<td>8.3%</td>
<td>0.9%</td>
<td><strong>5.1% (27/533)</strong></td>
</tr>
<tr>
<td>Afraid to seek health services</td>
<td>17.59%</td>
<td>18.3%</td>
<td>20.5%</td>
<td><strong>18.5% (99/535)</strong></td>
</tr>
<tr>
<td>Afraid to walk in community</td>
<td>15.5%</td>
<td>16.7%</td>
<td>29.1%</td>
<td><strong>19.0% (101/532)</strong></td>
</tr>
<tr>
<td>Blackmailed because of sexuality</td>
<td>18.0%</td>
<td>21.3%</td>
<td>26.5%</td>
<td><strong>21.2% (113/533)</strong></td>
</tr>
<tr>
<td>Yes to any of the above related to sexuality</td>
<td>34.3%</td>
<td>41.5%</td>
<td>56.9%</td>
<td><strong>42.1% (222/527)</strong></td>
</tr>
</tbody>
</table>

 Associations with Rights Violations  
 Malawi, Namibia, Botswana

- Men who reported blackmail
  - Much more likely to have disclosed sexual orientation to a family member
  - Less likely to have had HIV test in last 6 months
  - More likely to be afraid to seek health care

- Disclosing sexual orientation to health care workers
  - Highly associated with being denied health care
  - Much less likely to have had a HIV test in last 6 months

Anal Sex and Lubricant Use

Implications for microbicides
Anal Sex Frequency in Malawi, Botswana, Cape Town Townships, Namibia

- Lifetime anal intercourse was inclusion criteria:

- In last 6 months, reporting anal sex with a man:
  - Overall: $\frac{442}{502} = 88.0\%$
  - Malawi: $\frac{153}{176} = 86.9\%$
  - Botswana: $\frac{105}{115} = 91.\%$
  - Cape Town: $\frac{178}{197} = 90.4\%$
  - Namibia: $\frac{184}{211} = 87.2\%$
## Lubricant use for anal sex, MSM in Malawi, 2008

### Last sex with another man

<table>
<thead>
<tr>
<th>Lubricant</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum-based Products</td>
<td>77</td>
<td>46.8%</td>
</tr>
<tr>
<td>Water-based lubricant</td>
<td>45</td>
<td>24.2%</td>
</tr>
<tr>
<td>Saliva</td>
<td>21</td>
<td>11.3%</td>
</tr>
<tr>
<td>No lubricant</td>
<td>15</td>
<td>8.1%</td>
</tr>
<tr>
<td>No condoms/no lubricant</td>
<td>18</td>
<td>9.7%</td>
</tr>
</tbody>
</table>

Total: 186 | 100%

Only 6.7% (8/120) of those who reported always wearing condoms with men used a water-based lubricant.
### Lubricant use for anal sex, MSM in Namibia, Botswana, Malawi, 2008

<table>
<thead>
<tr>
<th>Lubricant</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum-based Products</td>
<td>210</td>
<td>41.2 %</td>
</tr>
<tr>
<td>Water-based lubricant</td>
<td>130</td>
<td>25.5 %</td>
</tr>
<tr>
<td>Saliva</td>
<td>35</td>
<td>6.7 %</td>
</tr>
<tr>
<td>No lubricant</td>
<td>104</td>
<td>20.4 %</td>
</tr>
<tr>
<td>No condoms/no lubricant</td>
<td>31</td>
<td>6.1 %</td>
</tr>
</tbody>
</table>

---

Total | 510 | 100 %

Across the three sites, 12.9% (49/379) of those who reported always wearing condoms with men and used water-based lubricant.

38.8% (147/379) of men reported always wearing condoms with men—but used petroleum-based, saliva, or no lubricant.
Factors associated with water-based lubricant use: B, N, M MSM, 2008

- no relationship between HIV and use of WBL compared to all other lubricants.

- MSM who use water-based lubricant tend to be more educated (p < 0.001)

- Less likely to be married or have girlfriend OR 0.59 (95% CI 0.36-0.98), p < 0.05

- Qualitative findings: barriers to WBL are cost, access, information stigma of purchase
Univariate associations with MSM that report being bisexually active (both male and female sexual partners in preceding 6 months)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Malawi</th>
<th>Namibia</th>
<th>Botswana</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always wear condoms</td>
<td>4.2 (0.5-35.0)</td>
<td>7.77 (3.18-18.98)</td>
<td>17.5 (2.17-142.3)</td>
<td>6.3 (3.2-13.9)</td>
</tr>
<tr>
<td>Always condoms with casual partners</td>
<td>6.3 (1.4-26.8)</td>
<td>7.1 (3.65-13.8)</td>
<td>26.3 (3.31-208.9)</td>
<td>6.0 (3.5-10.4)</td>
</tr>
<tr>
<td>Always condoms with regular partners</td>
<td>6.3 (1.4-26.8)</td>
<td>6.3 (2.77-14.39)</td>
<td>8.0 (2.7-23.5)</td>
<td>5.6 (3.1-10.0)</td>
</tr>
<tr>
<td>Not use Water-Based lubricant</td>
<td>1.0 (0.5-2.3)</td>
<td>1.8 (0.9-3.8)</td>
<td>5.9 (2.0-17.8)</td>
<td>2.0 (1.3-3.2)</td>
</tr>
</tbody>
</table>
Discussion

- African MSM are at high risk for HIV infection
- Anal sex is common among these men
- Water-based lubricants are little used—oil based products are the most commonly used
- Lubricant data suggests that a rectal microbicide with lubricant qualities would be highly valued by these men
Acknowledgements

Collaborators:

Stefan Baral  Center for Public Health and Human Rights, JHU
Gift Trapence  Center for the Development of People, Blantyre, Malawi
Felistus Motimedi  Botswana Network on Ethics, Law, and HIV/AIDS
Eric Umar  Department of Community Health, University of Malawi, College of Medicine, Blantyre, Malawi
Scholastika Iipinge  HIV/AIDS Coordinator, University of Namibia, Windhoek, Namibia
Friedel Dausab  The Rainbow Project, Windhoek, Namibia
Linda-Gail Bekker  Desmond Tutu HIV Research Center, UCT, Cape Town
Earl Burrell  Mother City Men’s Project

Many thanks to the study participants

Supported by the Open Society Institute Southern Africa