The Past as Prologue:
Emerging needs and future directions in research on HIV prevention and treatment among MSM

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Disclaimer

“It’s tough to make predictions, especially about the future”

-Yogi Berra
Presentation Goals

– To discuss probable future trends in the struggle to control HIV in terms of some of the lessons learned in the fight so far.

– To make the case that most of the challenges that we have already faced will continue during the era of combination prevention.

– To suggest some research approaches that may be useful as we start this new era.
Current Consensus of the Field Re: Prevention and Care

- The use of antiretroviral medications, both in terms of treatment and to prevent infections in HIV negatives, gives us a powerful tool to control HIV/AIDS.

- Both treatment and prevention goals will be realized by finding unknown positives, bringing them into care, helping them to adhere to care and achieve undetectable viral loads.
Diagnoses of HIV Infection among Adults and Adolescents, by Transmission Category, 2008–2011—United States and 6 Dependent Areas

Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays and missing transmission category, but not for incomplete reporting.

* Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

*b Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.
Diagnoses of HIV Infection among Adults and Adolescents, by Transmission Category, 2011—United States and 6 Dependent Areas

N = 50,007

- Male-to-male sexual contact: 62%
- Injection drug use (IDU) – Males: 18%
- Injection drug use (IDU) – Females: 10%
- Male-to-male sexual contact and IDU: 5%
- Heterosexual contact – Males: 3%
- Heterosexual contact – Females: 3%
- Other: <1%

Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays and missing transmission category, but not for incomplete reporting.

* Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

* Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.
Predictors of HIV Seroconversion among MSM

Remarkably stable over time:

- Relative youth
- African American race
- Substance use, especially non-IDU
- Risky sexual behaviors
Winning the fight against AIDS in the United States depends on our ability to find better ways to prevent new infections among men who have sex with men.
There was a time when we thought that HIV prevention among MSM would be relatively easy.
Early Behavioral Risk Reductions: the ABRP

### Rapidly Reduced Rates of HIV Seroconversion, SFMHS

<table>
<thead>
<tr>
<th>Period</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/82-12/84</td>
<td>18.4%</td>
</tr>
<tr>
<td>1/85-6/85</td>
<td>5.9</td>
</tr>
<tr>
<td>7/85-12/85</td>
<td>3.1</td>
</tr>
<tr>
<td>1/86-6/86</td>
<td>4.2</td>
</tr>
<tr>
<td>7/86-12/86</td>
<td>4.2</td>
</tr>
<tr>
<td>1/87-6/87</td>
<td>1.7</td>
</tr>
<tr>
<td>7/87-12/87</td>
<td>0.7</td>
</tr>
</tbody>
</table>

An Earlier Consensus for HIV Prevention among MSM

1) Reductions in sexual risk behaviors among MSM are relatively easy to achieve.

2) Once sexual risk is reduced, HIV seroconversion rates will plummet.

3) Behavioral risk reduction is our best tool to fight the AIDS epidemic.
Crixivan and kidneys: careful!

Ritonavir may interact with ecstasy

Thinking about selling your life insurance for cash? The time to act is now.
# An Early Cautionary Note: Behavior Maintenance is an Issue

## Aggregate Reductions

<table>
<thead>
<tr>
<th>Year</th>
<th>'84</th>
<th>'85</th>
<th>'86</th>
<th>'87</th>
<th>'88</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Levels</td>
<td>None</td>
<td>10%</td>
<td>14%</td>
<td>11%</td>
<td>19%</td>
</tr>
<tr>
<td>Low</td>
<td>32</td>
<td>39</td>
<td>43</td>
<td>50</td>
<td>58</td>
</tr>
<tr>
<td>Modified</td>
<td>17</td>
<td>24</td>
<td>26</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>High</td>
<td>41</td>
<td>23</td>
<td>21</td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>


## Individual Patterns

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Low Risk</td>
<td>48%</td>
</tr>
<tr>
<td>Change to Lower Risk</td>
<td>31</td>
</tr>
<tr>
<td>Relapse</td>
<td>19</td>
</tr>
<tr>
<td>Stable High Risk</td>
<td>2</td>
</tr>
</tbody>
</table>
Prevention Science and the Search for EBIs

- Behavioral risk reduction was widely seen as the best tool to lower HIV transmission.
- The early successes in reducing behavioral risk among MSM were not well studied and not well understood.
- A set of theory-based RCTs were fielded to test interventions to lower behavioral risk among MSM.
List of Currently-Supported EBIs by the CDC for MSM (of 17 total)

- d-up!
- Mpowerment
- 3MV
- POL
- PCC
- Promise
- Voices/Voces
Efficacy of RCT Behavioral Trials among MSM

- 2 recent meta-analyses of published RCT trials

- Herbst (2005) review reported a:
  - 23% decrease in unprotected anal sex
  - 15% decrease in numbers of sex partners
  - 61% increase in protected anal sex

Conclusion: HIV Behavioral Interventions Reduce Risk

- Interventions worked better if:
  - Theory based
  - Group discussions
  - Multiple (4+) message delivery methods
  - Interpersonal skill building
  - Greater intervention exposure

- HIV interventions can reduce behavioral risk if they are well supported and carefully fielded.
Critique of the EBIs

- EBIs often don’t exist for the highest risk MSM
- Fielding an EBI requires a well-trained field staff and considerable CBO resources.
- Staff turnover at CBO’s is very high, which means that keeping well-trained staff at a specific agency is a challenge.
- Resources, training and turnover issues mean that intervention fidelity is an issue.
Critique of the EBIs

- Proven interventions appear to be a “one size fits all” solution that ignore local contexts, sub-populations and change in gay culture of time.
- Adaptation of EBI’s so that they are appropriate for populations in which the EBI wasn’t originally tested is an inexact science.
- Uptake/Access to EBIs is probably very low among many MSM populations.
No obits
Weighted Mean Incidence Rates among MSM in the US, 1995-2005

- Community-Based Samples
  2.39% (95% CI 2.2, 2.6)

- HIV Test Site Samples
  2.45% (95% CI 2.1, 2.8)

- STD Treatment Samples
  3.84% (95% CI 3.2, 4.5)
At a 2.39% incidence rate, what percentage of HIV negative MSM now aged 18 will be HIV positive by the time they reach the age of 40?
HIV Prevalence by Age
US MSM Community Samples, HIV Incidence at 2.39%
HIV Prevalence by Age
US and African-American MSM; 2.39% incidence among MSM, 4% for African American MSM
HIV Prevalence by Age
US MSM Community Samples, HIV Incidence at 2.39%

## HIV Prevalence among MSM: 21 Cities

**MMWR, Sept. 24, 2010, 59(37) 1201-7**

<table>
<thead>
<tr>
<th>Age</th>
<th>Prevalence</th>
<th>95% CI’s</th>
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<tbody>
<tr>
<td>18-19</td>
<td>14%</td>
<td>(8-23)</td>
</tr>
<tr>
<td>20-24</td>
<td>15%</td>
<td>(11-19)</td>
</tr>
<tr>
<td>24-29</td>
<td>17%</td>
<td>(13-22)</td>
</tr>
<tr>
<td>30-39</td>
<td>29%</td>
<td>(26-33)</td>
</tr>
<tr>
<td>40-49</td>
<td>38%</td>
<td>(33-44)</td>
</tr>
<tr>
<td>&gt;50</td>
<td>30%</td>
<td>(22-40)</td>
</tr>
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</table>
Seemingly low HIV incidence rates can result in reproduction of very high rates of HIV infection across generations of gay men, even during an era with widespread HAART initiation and significant efforts by the CDC to diffuse EBIs.
Explanations for Stable MSM Serconversion Rates Over Time

- Biological population dynamics of the epidemic
- Syndemic processes
- TasP effects counterbalanced by increases in risk during the HAART era
- Overemphasis in behavioral prevention efforts individual-level mechanisms
Partial Explanations for Higher Infection Rates Among African American MSM; Millett, et al., 2007

Higher rates of sexual risk early in the epidemic

Higher rates of untreated sexually-transmitted diseases

Undiagnosed HIV infection

Lower ART use

Health Profile of Urban Gay Men

Very High Rates of Distress and Depression


Very High Rates of Attempted Suicide


High Rates of Childhood Sexual Abuse

Health Profile of Urban Gay Men

Very High Rates of HIV Infection

Very High Rates of Substance Use and Abuse

Very High Rates of Partner Violence
Intertwining Epidemics among Urban MSM *(Significant OR estimates, controlling for age, education, race, income, HIV status and sexual risk)*

<table>
<thead>
<tr>
<th></th>
<th>Childhood Sex Abuse</th>
<th>Partner Violence</th>
<th>Depression</th>
<th>Substance Abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Childhood Sex Abuse</td>
<td>--------</td>
<td>1.9</td>
<td>1.9</td>
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<tr>
<td>Partner Violence</td>
<td>1.9</td>
<td>--------</td>
<td>1.6</td>
<td>2.2</td>
</tr>
<tr>
<td>Depression</td>
<td>1.9</td>
<td>1.6</td>
<td>--------</td>
<td>1.4</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>2.2</td>
<td>1.4</td>
<td>--------</td>
<td></td>
</tr>
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</table>
Intertwining Epidemics Predict HIV Prevalence and High Risk Sexual Behavior

<table>
<thead>
<tr>
<th>No. of Psychosocial Health Problems</th>
<th>0 ((n = 1,392))</th>
<th>1 ((n = 812))</th>
<th>2 ((n = 341))</th>
<th>3 or 4 ((n = 129))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recent high risk sex</td>
<td>7%</td>
<td>11%</td>
<td>16%</td>
<td>23%</td>
</tr>
<tr>
<td>HIV prevalence</td>
<td>13%</td>
<td>21%</td>
<td>27%</td>
<td>22%</td>
</tr>
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</table>

All associations have \(p\)'s < 0.001. All \(p\) values are two-tailed.

Stall et al., “Association of co-occurring psychosocial health problems and increased vulnerability to HIV/AIDS among urban men who have sex with men, AJPH. 2003;93(6):939-942
Reasons Why Behavioral Interventions Failed to Stop the AIDS Epidemic among MSM

- Behavior change in marginalized populations
- Stigma as a barrier to intervention uptake
- Maintenance of behavior change over time
- Underfinanced public health systems
- Underfunding of MSM research and public health practice
- Politicization of public health practice
Reasons Why Behavioral Interventions Failed to Stop the AIDS Epidemic among MSM

Challenges due to:
- Race disparities as a barrier to uptake
- Under-appreciation of STIs as drivers of HIV incidence
- Under-appreciation of syndemic conditions as drivers of HIV incidence
- Under-appreciation of community viral load as a driver of HIV incidence
- Translation to widespread public health practice
Are Antiretroviral-Based Prevention Models Vulnerable to these Same Challenges?

<table>
<thead>
<tr>
<th></th>
<th>PEP</th>
<th>PrEP</th>
<th>TasP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marginalization</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Stigma</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Racial Disparities</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Underfunding/MSM</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Syndemic Conditions</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</tr>
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<tbody>
<tr>
<td>Underfunding/PH</td>
<td>???</td>
<td>???</td>
<td>???</td>
</tr>
<tr>
<td>Politicization</td>
<td>???</td>
<td>???</td>
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</tr>
<tr>
<td>STI effects</td>
<td>???</td>
<td>???</td>
<td>Yes</td>
</tr>
<tr>
<td>Community Viral Load</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Translation Challenges</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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Prediction

Even though antiretroviral-based HIV prevention strategies offer an important tool to lower HIV incidence in some contexts, the historically-important challenges to HIV prevention that we have always faced will disrupt their effectiveness to the point that they will fail to control the AIDS epidemic among MSM.
“It’s déjà vu all over again”

Behavioral research agendas in the “new” era will involve the design and testing of:

- HIV treatment adherence support programs
- PEP/PrEP adherence support programs
- Interventions designed to identify unknown positives and get them into care
- Interventions to find people lost to care and get them to reconnect to care.
More innovative approaches…

- Attempts to disrupt syndemics as a means of lowering HIV risk and improving successful navigation of the treatment cascade.

- Network-based interventions that allow efficient identification of newly exposed HIV positives.

- Study of the strategies that high risk clients use to successfully navigate the treatment cascade.
More innovative approaches...

- Study of health systems that have a high success rate in helping HIV+ clients achieve undetectable viral loads.
- Study of how changing policies governing citizenship protections for sexual minorities affect HIV epidemic dynamics.
- Support a broader health movement for gay men as a tool to increase efficiency of HIV prevention and treatment.
Multiple Levels of Prevention Activity

- **Individual**
  - Continued EBI programs
  - Maintenance

- **Interpersonal**
  - Dyad–based interventions

- **Community**
  - Violence
  - Racism/homophobia
  - Stigma
  - Syndemic conditions
Multiple Levels of Prevention Activity

- Public Health Infrastructure
  - Focus on the treatment cascade (esp. finding unknown positives)
  - Improving STI prevention
  - Syndemic conditions
  - Revitalizing public health systems
  - Universal access to medical care
  - Addressing racial health disparities
  - Citizenship protections
  - Leadership and funding to support gay men’s health programs

- Governmental Policy
Lessons Learned

- MSM have always been a major risk group for HIV transmission and are now by far the dominant AIDS risk group in the US.

- Attempts to control the epidemic by intervening at the level of individual risk behaviors have been shown to be efficacious but whether these have been effective at the public health level is arguable at best.
Current State of the Epidemic among MSM

- HIV incidence rates among MSM appear to be high enough to reproduce the epidemic across generations of young gay men.
- This is especially the case for African American MSM.
- MSM will continue to be the dominant risk group for HIV transmission for the foreseeable future.
Some Cautionary Notes

- The experience of STI control among MSM strongly suggests that there will be no magic bullet to prevent HIV transmission.
- Biomedical approaches to HIV prevention cannot work if they are not used.
- Challenges that have manifested since the start of the epidemic have a high potential for disrupting uptake of these tools.
Modification of the Current Field Consensus

- Biomedically-based approaches to stopping HIV transmission among MSM hold great promise.
- These approaches will almost certainly need to include behavioral components if they are to be effective in stopping the HIV/AIDS epidemic among MSM.
- Attempts to study and harness the effects of multiple levels of HIV prevention efficacy from the individual to the structural are also indicated as a means of controlling the epidemic.