Incorporating and Understanding Syndemics and Resiliencies as Part of Biomedical Combination Prevention

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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.

*a* 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.
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 among MSM: 21 Cities

<table>
<thead>
<tr>
<th>Age</th>
<th>Prevalence</th>
<th>95% CI’s</th>
</tr>
</thead>
<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>
</tbody>
</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.
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.

a 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.
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.
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 high risk MSM
- Fielding an EBI requires a well-trained field staff and considerable CBO resources.
- Staff turnover at CBO’s is high: keeping well-trained staff at a specific agency is a challenge.
- Resources, training and turnover issues mean that intervention fidelity is an issue.
- Vulnerability-based interventions are off-putting.
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
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

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
- Overemphasis on vulnerabilities in EBIs
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>1.9</td>
<td>1.9</td>
<td>1.9</td>
<td>2.2</td>
</tr>
<tr>
<td>Partner Violence</td>
<td>1.9</td>
<td>1.6</td>
<td>1.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Depression</td>
<td>1.9</td>
<td>1.6</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>2.2</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</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>
</tbody>
</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

Challenges due to:

- 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>
</tr>
</tbody>
</table>
## Are Antiretroviral-Based Prevention Models Vulnerable to these Same Challenges?

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<thead>
<tr>
<th></th>
<th>PEP</th>
<th>PrEP</th>
<th>TasP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underfunding/PH</td>
<td>???</td>
<td>???</td>
<td>???</td>
</tr>
<tr>
<td>Politicization</td>
<td>Probably</td>
<td>Probably</td>
<td>Probably</td>
</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>
</tr>
</tbody>
</table>
Prediction

Even though existing antiretroviral-based HIV prevention strategies offer an important tool to lower HIV incidence, 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.
Prediction

Because the population effect sizes of PEP, PrEP and TasP are likely to be too small to control the epidemic among MSM, we will have to continue to design and test behavioral interventions to support these strategies, and others, to help address treatment cascade challenges.
Necessary Qualities of Behavioral Interventions in the Combination Prevention Era

- Effect sizes will need to be increased.
- Greater focus on maintenance issues.
- Culturally appropriate and consistent with strategies already being used among MSM.
- This will require tapping additional mechanisms of efficacy than what we have used so far in behavioral interventions.
So how does a focus on resiliences help?
Resilience is Self-Evident in Gay Men’s Life Histories

- Coming out
- Homophobia management
- Creating safe religious institutions
- Finding and creating families
- Institution/Community Building
- Activism for citizenship rights
- Ability to thrive even through AIDS
Health Resiliencies are Commonly Found among Gay Men

- Lots of substance use, relatively few substance abuse-related problems
- Smoking cessation
- Large proportions of gay men remain HIV negative throughout the life course
- Many HIV positive men remain healthy and productive
- Resolution of substance abuse careers
Trajectories of stimulant drug use from visit 40-48 (Oct 2003-March 2008) in MACS, N=2457

“No use” 68.8%, “Some use” 7.2%, “Increasing” 5.8%, “Decreasing” 8.5% “Consistently high” 10.5%
The Logic of “Deficit-based” Approaches to Intervention Design

- Identify risk factors for poor health outcomes
- Design interventions to address these risk mediators
- Test efficacy of the intervention
- If efficacious, attempt community-based scale-up to achieve effectiveness
Rationale for the Deficit Logic

- It is inarguable that many health disparities exist within gay male communities.
- Understanding “what is going wrong” makes intuitive sense in terms of finding fixes for serious health problems.
- But is this the most effective approach to finding these fixes?
Central Questions

- Should the evidence for intervention design be based on analyses that emphasize the experiences of the highest risk men?
- How would intervention design be different if it was driven by insights from men who are lowering risk, or men who are only rarely at high risk?
Central Questions

- Which insights provide the most valuable basis for intervention design: insights about trajectories of ongoing/increasing risk or trajectories of relative safety?
- Could insights from both kinds of analyses be incorporated into interventions to increase efficacy?
Limitations of Deficit Based Approaches

- Trajectories of risk production may have different mediators than trajectories that produce safety.
- Generalizability: By defining intervention content on the experiences of highest risk men are we emphasizing issues that don’t resonate with men at lower risk?
- Does this introduce credibility problems?
Limitations of Deficit-Based Approaches

- Deficit-based approaches produce knowledge about what NOT to do, not what TO do.
- Risk reduction involves exercising strengths; a focus on deficits does not help men access these strengths.
Limitations of Deficit-Based Approaches

- Deficit-based approaches are reactive rather than proactive.
- Deficit-based interventions are designed for men who will remain in high risk environments; once effects disappear, men are left with attenuated resources.
- Explanation for time-limited intervention effects?
Limitations of Deficit Based Approaches

- May produce uninviting interventions (implicit messages: your sexual habits are life-threatening, you don’t know about HIV, you use too many drugs, your community’s norms are toxic)

- Do such implicit messages inhibit intervention uptake?
## Resolution of Internalized Homophobia over Time: MACS

<table>
<thead>
<tr>
<th>Experience</th>
<th>Time 1 %</th>
<th>Time 2 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>I tried to stop being attracted to men in general.</td>
<td>35.9</td>
<td>5.6</td>
</tr>
<tr>
<td>If someone had offered me the chance to be completely heterosexual, I would have accepted the chance.</td>
<td>43.9</td>
<td>12.1</td>
</tr>
<tr>
<td>I wished I weren’t attracted to men.</td>
<td>39.2</td>
<td>10.0</td>
</tr>
<tr>
<td>I felt that being gay/bisexual was a personal shortcoming for me.</td>
<td>42.7</td>
<td>9.0</td>
</tr>
<tr>
<td>I wanted to get professional help in order to change my sexual orientation to heterosexual.</td>
<td>14.5</td>
<td>3.4</td>
</tr>
<tr>
<td>I tried to become more sexually attracted to women.</td>
<td>38.7</td>
<td>5.3</td>
</tr>
<tr>
<td>I often felt it best to avoid personal or social involvement with other gay/bisexual men.</td>
<td>27.5</td>
<td>7.4</td>
</tr>
<tr>
<td>I felt alienated from myself because of being gay/bisexual.</td>
<td>30.8</td>
<td>6.1</td>
</tr>
<tr>
<td>I wished that I could have developed more erotic feelings about women.</td>
<td>40.1</td>
<td>8.2</td>
</tr>
</tbody>
</table>
Resolution of Internalized Homophobia Disruptes Syndemic Production

<table>
<thead>
<tr>
<th>Condition</th>
<th>N (%) of sample w/o condition</th>
<th>OR</th>
<th>(95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No/Low Stimulant Use</td>
<td>1445 (94)</td>
<td>1.01</td>
<td>(.570, 1.79)</td>
</tr>
<tr>
<td>No Depression</td>
<td>1160 (75)</td>
<td>2.14**</td>
<td>(1.57, 2.92)</td>
</tr>
<tr>
<td>No/Low Stress</td>
<td>1091 (71)</td>
<td>1.69**</td>
<td>(1.23, 2.32)</td>
</tr>
<tr>
<td>No Intimate Partner Violence</td>
<td>1047 (68)</td>
<td>1.33*</td>
<td>(1.01, 1.79)</td>
</tr>
<tr>
<td>No/Low Sexual Compulsivity</td>
<td>1281 (83)</td>
<td>1.76**</td>
<td>(1.25, 2.48)</td>
</tr>
<tr>
<td>No Syndemic</td>
<td>1043 (68)</td>
<td>2.15**</td>
<td>(1.58, 2.91)</td>
</tr>
</tbody>
</table>
Ex: Identifying Protective Factors

Resilience Paradigm:

- Adversity
- Syndemics
- HIV Risk
MSM Resiliencies: Pitt/Fenway Conference

- **Individual Level**
  - Internal homophobia management & shame
  - Self monitoring & goal setting
  - Adaptability and coping

- **Dyadic Level**
  - Relationship building
  - Dyadic support

- **Family Level**
  - Biological family resolution
  - Social bonding
MSM Resiliencies: Pitt/Fenway Conference

Community Level
- Connection to community
- Institutional support
- Community building
- Commitment to community building
- Homophobia management
- External monitoring
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 no one 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

- Although 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 resiliency-based HIV prevention efforts from the individual to the structural are also indicated as a means of controlling the epidemic.