Interventions that reduce the burden of syphilis and HIV among pregnant women

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Disclosures

- Dr. Klausner is a faculty member of the University of California Los Angeles
- Dr. Klausner is a board member of YTH, Inc, non-profit
- Dr. Klausner is an unpaid medical advisor for Healthvana.com

- In the past 12 months:
  - Research funding or donated supplies from the US NIH, US CDC, AIDS Healthcare Foundation, Gilead Sciences, Hologic, Alere-Standard Diagnostics, Chembio, Cepheid and MedMira.
  - Speakers bureau: None
  - Advisory board: None
  - Consultant activities: AIDS Healthcare Foundation, Flora Biosciences, Sentient Research, AIDS Project Los Angeles

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Outline

• Theoretical basis for prevalence reduction
• United States, 1940-1960
• Uganda, 1985-2001
• Thailand, 1989-2005
• Zimbabwe, 1998-2011
Prevalence = Incidence x Duration

Incidence is function of:

- Transmission efficiency
- Contact rate
- Prevalence
SYPHILIS

ALL OF THESE MEN HAVE IT

WOMEN: STAY AWAY FROM DANCE HALLS
Syphilis—Reported Cases by Stage of Infection, United States, 1941–2013

Cases (in thousands)

- Primary and Secondary
- Early Latent
- Total Syphilis

Year


Cases (in thousands)

600 480 360 240 120 0
Public health approach

- Case-finding
- Contact tracing
- Partner treatment

Parran, T. *Shadow on the Land Syphilis*, 1937
Routine testing

• Blood test requirements (rubella, syphilis)
  – Marriage
  – Education
  – Employment
  – Military
Partner notification

- Public health workforce
  - Nurses
  - Disease control investigators
- Physician responsibility
Prophylactic treatment

- By 1946, prophylactic penicillin treatment demonstrated effective
  - Public health clinics
  - Home therapy
  - No cost
Antenatal prevalence Malawi, Zambia and Uganda, 1985-2001

Promotion of sexual behavior change

Image Source: Association for Diplomatic Studies and Training

**Table 1. Prevalence of HIV Infection among Young Men in Northern Thailand Conscripted at the Age of 21 in 1991, 1993, and 1995.**

<table>
<thead>
<tr>
<th>Date of Induction</th>
<th>No. Inducted</th>
<th>No. HIV-Positive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>935</td>
<td>97 (10.4)</td>
</tr>
<tr>
<td>November</td>
<td>888</td>
<td>111 (12.5)</td>
</tr>
<tr>
<td>1993</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>869</td>
<td>107 (12.3)</td>
</tr>
<tr>
<td>November</td>
<td>798</td>
<td>92 (11.5)</td>
</tr>
<tr>
<td>1995</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>821</td>
<td>55 (6.7)</td>
</tr>
<tr>
<td>November†</td>
<td>745</td>
<td>51 (6.8)</td>
</tr>
</tbody>
</table>
100% Condom Program

• Campaign
  – Widespread

• Administrative
  – Health officials
  – Police
  – Elected officials
  – Accountability

Meechai, “Condom King”

Rjanapithayakorn, AIDS, 1996
HIV Prevalence in Select Groups
Thailand, 1989-1994

Table 1. HIV prevalence in various sentinel groups, and commercial sex acts where condoms were used.

<table>
<thead>
<tr>
<th>Date</th>
<th>Direct</th>
<th>Indirect</th>
<th>Pregnant women</th>
<th>Army conscripts</th>
<th>Commercial sex acts where condoms were used (%)*$†</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-January 1989</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>~</td>
</tr>
<tr>
<td>June 1989</td>
<td>3.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>25</td>
</tr>
<tr>
<td>December 1989</td>
<td>6.3</td>
<td>1.2</td>
<td>0.0</td>
<td>0.0</td>
<td>50</td>
</tr>
<tr>
<td>June 1990</td>
<td>9.3</td>
<td>1.2</td>
<td>0.0</td>
<td>0.0</td>
<td>56</td>
</tr>
<tr>
<td>December 1990</td>
<td>12.2</td>
<td>2.7</td>
<td>0.3</td>
<td>2.1</td>
<td>55</td>
</tr>
<tr>
<td>June 1991</td>
<td>15.2</td>
<td>4.0</td>
<td>0.8</td>
<td>2.9</td>
<td>74</td>
</tr>
<tr>
<td>December 1991</td>
<td>21.6</td>
<td>5.4</td>
<td>0.7</td>
<td>3.0</td>
<td>85</td>
</tr>
<tr>
<td>June 1992</td>
<td>23.8</td>
<td>4.7</td>
<td>1.0</td>
<td>3.6</td>
<td>90</td>
</tr>
<tr>
<td>December 1992</td>
<td>23.9</td>
<td>6.5</td>
<td>1.0</td>
<td>3.5</td>
<td>93</td>
</tr>
<tr>
<td>June 1993</td>
<td>27.1</td>
<td>7.5</td>
<td>1.4</td>
<td>4.0</td>
<td>94</td>
</tr>
<tr>
<td>December 1993</td>
<td>29.5</td>
<td>7.7</td>
<td>1.5</td>
<td>3.4</td>
<td>96</td>
</tr>
<tr>
<td>June 1994</td>
<td>27.0</td>
<td>7.7</td>
<td>1.8</td>
<td>3.3</td>
<td>92</td>
</tr>
<tr>
<td>December 1994</td>
<td>30.6</td>
<td>9.5</td>
<td>1.6</td>
<td>2.7</td>
<td>~</td>
</tr>
</tbody>
</table>

Rojanapithayakorn, AIDS, 1996

ANC, antenatal clinic. HIV prevalence (whiskers show 95% confidence intervals) in pregnant women versus those aged 15–49 years in the general population

Gregson S et al. AIDS, 2015
A Surprising Prevention Success: Why Did the HIV Epidemic Decline in Zimbabwe?

Daniel T. Halperin, Owen Mugurungi, Timothy B. Hallett, Bayson Muchini, Bruce Campbell, Tapuwa Magure, Clemens Benedikt, Simon Gregson


Table 1. Contributions of proximate causes to the HIV decline in Zimbabwe.

<table>
<thead>
<tr>
<th>Proximate Cause</th>
<th>Population-Level Effectiveness$^a$</th>
<th>Extent of Change$^b$</th>
<th>Consistency in Timing of Change$^c$</th>
<th>Major Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at first sex - postponement</td>
<td>Low</td>
<td>Low [QN]</td>
<td>Consistent</td>
<td>Unlikely</td>
</tr>
<tr>
<td>Partner numbers - reduction</td>
<td>High</td>
<td>High [QN &amp; QL]</td>
<td>Consistent</td>
<td>Likely</td>
</tr>
<tr>
<td>Condom use - increase (in non-marital partnerships)</td>
<td>High (if consistent use)</td>
<td>Moderate [P, QN, QL]</td>
<td>Earlier</td>
<td>Plausible</td>
</tr>
<tr>
<td>Biological</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission probability - reduction$^d$</td>
<td>High</td>
<td>Low [QN &amp; P]</td>
<td>Earlier</td>
<td>Unlikely</td>
</tr>
</tbody>
</table>

1. While there have been promising breakthroughs in a few other areas, notably male circumcision and prevention of mother-to-child transmission (PMTCT) [1,2,5], it is widely recognized that behavior change must remain a core prevention effort [2–4].

2. While the often cited prevention success stories of Thailand [6] and Uganda [7,8] are

3. The PEPFAR Program (Program for Enhanced and Expanded Programs for AIDS) has been instrumental in assessing the contributions of different contextual and programmatic factors to observed changes in behavior. Finally, DHS data on various potential proximal and contextual determinants of behavior change for Zimbabwe were compared with similar data for seven other Southern African countries to identify distinctive patterns that might help to...
What do cases tell us?

1) Prevalence can decline
2) Behaviors do change
3) Policy matters
4) Public health investment required
Dual rapid point-of-care HIV and syphilis tests

- Simplify training
- Streamline procurement
- Ensure testing for both HIV and syphilis
- Improve client experience
Where do we go?

• Better advocacy for STD and HIV prevention
• Stronger testing and treatment programs with monitoring and accountability
• Consider use of new tools like point-of-care rapid dual tests for HIV and syphilis
• Continue routine screening
Thank you