Preventing new HIV infections in young women in Sub-Saharan Africa – why is it so difficult?

Sinead Delany-Moretlwe MD PhD
Wits Reproductive Health and HIV Institute
University of Witwatersrand, Johannesburg

Symposium: When worlds collide – Adolescents and HIV
CROI 2013, Atlanta
Overview

• Review epidemiology of HIV infection in young women in Africa

• Review existing interventions and their success

• Review potential future interventions and options for combination HIV prevention
3.9 million young people in Sub-Saharan Africa aged 15 – 24 years are living with HIV. Three-quarters are young women.
Despite significant progress, HIV incidence in young women in South Africa still high

- **Treatment**: 1.2 million people currently
- **HCT**: 13.2 million counselled and tested in 2011
- **Male condoms**: 492 million distributed in 2010
  - ↑ by 30% in 5 years
- **Voluntary medical male circumcision**: 250,000 in 2011
  - ↑ 50-fold from 5190 circumcisions in 2008
- **Preventing mother-to-child transmission**:
  - 92% of HIV+ mothers receive ART prophylaxis
  - Vertical transmission rate in 2011 = 2.7%

*Mayosi, Lancet 2012; Rehle, PLOS One, 2010*
Despite significant progress, HIV incidence in young women in South Africa still high

- Treatment: 1.2 million people currently
- HCT: 13.2 million counselled and tested in 2011
- Male condoms: 492 million distributed in 2010
- Voluntary medical male circumcision: 250,000 in 2011 – 5-fold from 5190 circumcisions in 2008
- Preventing mother-to-child transmission:
  - Vertical transmission rate in 2011 = 2.7%
  - 92% of all infected children in South Africa

BUT

HIV incidence is 10-fold higher in young women than young men

and the highest of any demographic group in the country

Mayosi, Lancet 2012; Rehle, PLOS One, 2010
Prevention strategies

- Male circumcision
  - Gray R, Lancet 2007

- Treatment of STIs
  - Grosskurth H, Lancet 2000

- Male & female condoms

- Microbicides for women
  - Abdool Karim Q, Science 2010

- Oral pre-exposure prophylaxis
  - Grant R, NEJM 2010 (MSM)
  - Baeten J, NEJM 2012 (couples)
  - Thigpen, NEJM, 2012 (Heterosexuals)

- Treatment for prevention
  - Donnell D, Lancet 2010
  - Cohen M, NEJM 2011

- Behavioural intervention

- Harm Reduction/Needle exchange

- HIV Counselling and Testing
  - Coates T, Lancet 2000

- PMTCT

- Post Exposure prophylaxis (PEP)
  - Scheckter M, 2002

- Mugo TUPL0102
Lessons learnt from existing HIV prevention strategies

- Existing accepted proven HIV prevention strategies - ABCC:
  - Abstinence
  - Behaviour (Be faithful)
  - Condoms (male & female)
  - Circumcision (Medical Male)

Which of these are prevention tools for young women in Africa?
Evidence that behaviour change interventions can reduce HIV infection in adolescents

- 28 studies in sub-Saharan Africa up to August 2008
- 15 in schools, 8 in communities and 5 in both
- 12 RCTs (8 randomising schools, 3 communities, 1 students),
  6 used pre- post-test, 10 quasi-experimental
- Only 3 studies had biological endpoints
Evidence that interventions can change behaviour and reduce HIV infection in adolescents

- 28 studies in sub-Saharan Africa up to August 2008
- 15 in schools, 8 in communities and 5 in both
- 12 RCTs (8 randomising schools, 3 communities, 1 students), 6 used pre-test, 10 quasi-experimental
- Only 3 studies had biological endpoints

Sex education and condom promotion activities among youth did not increase sexual activity nor promote risky sexual behaviour. But no large positive changes either.

No significant reductions in sexual activity, and

Condom use at last sex only increased significantly among males.
Poor implementation of school-based programmes is common

- Reluctance to talk about condoms in schools, or by teachers
- Non-participation of schools is common in studies or interventions
- Many interventions are based on paradigm that awareness of HIV-risk determines behaviour

Social and cultural norms around adolescent health may limit the success of school-based programmes. Wight BMC Pub Health 2012
What have we learnt from these studies?

• Large trials have not shown significant impacts on HIV incidence

• Many studies show behavioural effects

• Knowledge is a right and an essential precursor to behaviour change, but insufficient in itself

• For meaningful sustained behaviour change, interventions must be combined, of adequate duration and intensity

• Need to address the ability of young women to change sexual behaviour in context of unequal gender power relations & poverty
HCT is a critical entry point for biomedical HIV prevention options

- HIV testing uptake is low amongst young women in SSA

- A review of HIV policy documents in 20 countries showed that only 35% of policies on HIV testing offered details on HIV testing and children

- Even where permissive policies exist, clear international and country-level guidance for testing is required

Wong, 2004
HCT is a critical entry point for biomedical HIV prevention options

SOUTHERN AFRICA: HIV testing in schools is a minefield

Stop HIV tests in schools, Motshekga says

the development process

Wong, 2004
Can a pill (or a gel) prevent HIV?

Antiretroviral medication, Uganda
## Is daily PrEP suitable for young women?

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>N</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAPRISA 004</td>
<td>Women</td>
<td>889</td>
<td>39% [CI = 6-60] efficacy coitally-dependent vaginal TFV gel</td>
</tr>
<tr>
<td>South Africa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partners PrEP Study</td>
<td>Serodiscordant couples</td>
<td>4758</td>
<td>67% [CI = 44-81] efficacy daily oral TDF</td>
</tr>
<tr>
<td>Kenya, Uganda</td>
<td></td>
<td></td>
<td>75% [CI = 55-87] efficacy daily oral FTC/TDF</td>
</tr>
<tr>
<td>TDF2 Study</td>
<td>Men and women</td>
<td>1200</td>
<td>62% [CI = 22-83] efficacy daily oral FTC/TDF</td>
</tr>
<tr>
<td>Botswana</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FEM-PrEP</td>
<td>Women</td>
<td>1950</td>
<td>Futility of daily oral FTC/TDF</td>
</tr>
<tr>
<td>Kenya, S Africa, Tanzania</td>
<td></td>
<td></td>
<td>6% [CI = -52-41]</td>
</tr>
<tr>
<td>VOICE</td>
<td>Women</td>
<td>5029</td>
<td>Oral TFV -48.8%</td>
</tr>
<tr>
<td>South Africa, Uganda, Zimbabwe</td>
<td></td>
<td></td>
<td>Oral TFV/FTC -4.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Daily vaginal TFV 14.7%</td>
</tr>
<tr>
<td>FACTS 001</td>
<td>Women</td>
<td>2900</td>
<td>Coitally-dependent vaginal TFV gel enrolling</td>
</tr>
<tr>
<td>South Africa</td>
<td></td>
<td></td>
<td>Results expected in 2015</td>
</tr>
</tbody>
</table>

HIV incidence in VOICE trial was high 5.7%, highest in S. African participants
What have we learnt about adherence from PrEP trials

<table>
<thead>
<tr>
<th>RR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt;25</td>
<td>1.66</td>
</tr>
<tr>
<td>Married</td>
<td>2.62</td>
</tr>
<tr>
<td>Male partner &gt; 28 years</td>
<td>1.49*</td>
</tr>
</tbody>
</table>

Similar findings in other studies – age and partnership status are critical

Marazzo, CROI 2013; Hughes, MTN 2012
Is daily PrEP suitable for young women?

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Married/Stable partner</th>
<th>Efficacy</th>
<th>Adherence (as per drug levels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAP 004</td>
<td>24</td>
<td>88%</td>
<td>39% [CI = 6-60]</td>
<td>40%*</td>
</tr>
<tr>
<td>Partners PrEP</td>
<td>36</td>
<td>98%</td>
<td>67% [CI = 44-81]</td>
<td>TDF 81%</td>
</tr>
<tr>
<td>PrEP</td>
<td></td>
<td></td>
<td>75% [CI = 55-87]</td>
<td>FTC/TDF</td>
</tr>
<tr>
<td>TDF-2</td>
<td>25</td>
<td>6%</td>
<td>62% [CI = 22-83]</td>
<td>79%</td>
</tr>
<tr>
<td>FEM-PrEP</td>
<td>24</td>
<td>31%</td>
<td>6% [CI = -52-41]</td>
<td>26%</td>
</tr>
<tr>
<td>VOICE-SA</td>
<td>25</td>
<td>8%</td>
<td>Oral TFV 1.49 NS</td>
<td>28%</td>
</tr>
<tr>
<td>VOICE-Ug</td>
<td>28</td>
<td>50%</td>
<td>Oral TFV/FTC 1.04 NS</td>
<td>29%</td>
</tr>
<tr>
<td>VOICE-Zim</td>
<td>28</td>
<td>94%</td>
<td>Vaginal TFV 0.85 NS</td>
<td>22%</td>
</tr>
<tr>
<td>FACTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Slide courtesy of Mitchel Warren, AVAC; Marrazzo CROI 2013
HIV prevention in young women in SSA is influenced by population and place
Adolescence is a period of immense transition.

- 10-14 years
- 15-19 years
- 20-24 years

Puberty
Neurocognitive
Emotional
Social change
Adolescence is a period of immense transition

“...a highly functional and adaptive period...”

Sawyer, Lancet 2012
High risk sexual behaviour in young South Africans
YRBS 2008

• 38% of learners reported ever having had sex
  • 13% sexual debut <14 years.
  • 41% ≥ 2 lifetime sexual partners
  • 31% practised consistent condom use
  • 19% had been pregnant or made someone pregnant
• 65% had received HIV/AIDS education

Sex with a partner
≥5 years older

<table>
<thead>
<tr>
<th>Year</th>
<th>M (2%)</th>
<th>F (1%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A tale of two countries: Rethinking sexual risk for HIV among young people in South Africa and the United States  

<table>
<thead>
<tr>
<th></th>
<th>South Africa</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>National HIV prevalence</td>
<td>10.2</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Age of first sex</td>
<td>16.7</td>
<td>16.5</td>
</tr>
<tr>
<td>Median number of lifetime partners for</td>
<td>2</td>
<td>5.7</td>
</tr>
<tr>
<td>Condom use at last sex</td>
<td>45%</td>
<td>36%</td>
</tr>
<tr>
<td>Mean age difference with last sex partner</td>
<td>4</td>
<td>2.6</td>
</tr>
</tbody>
</table>

All risk behaviour differences statistically significant
Context matters: Sex, alcohol and violence

Sex and substance use
- 35% had drunk alcohol in the previous month
- 16% had sex after consuming alcohol,
- 14% had sex after taking drugs, and

Sex and violence
- 10% had ever been forced to have sex
- 9% forced someone else to have sex

YRBS, 2008; Somji ISSTD 2011
Lack of educational and employment opportunities for young women

- Poverty pushes young women out of school
- Secondary school completion rates are low, particularly for young women in SSA (< 40%)
- Young people make up 40% of the unemployed globally
  - Young women in low and middle income countries find it more difficult to find work
- Primary driver for transactional sex and sex work in many settings

UNAIDS, 2011; Unicef, 2012
Lack of educational and employment opportunities for young women

- Poverty pushes young women out of school
- Secondary school completion rates are low in SSA%
- Young people make up 40% of the unemployed globally
  - Young women in low and middle income countries find it more difficult to find work
- Primary driver for transactional sex and sex work in many settings

Failure to complete secondary school was associated with a fourfold higher prevalence of HIV infection in young women in South Africa Pettifor IJE 2008
Young men and women are particularly vulnerable to the health disparities generated by rapid economic development and urbanisation.
Urbanisation leads to concentration of infections in cities

Rapid urbanisation has consequences from young women’s risk

Young women’s health is socially determined

Adolescence and the social determinants of health

Russell M Viner, Elizabeth M Ozer, Simon Denny, Michael Marmot, Michael Resnick, Adesegun Fatusi, Candace Currie

Ecological analyses:

• National wealth, income inequality and access to education associated with poor adolescent health outcomes worldwide

• Countries with a greater proportion of school enrolment had better health outcomes, including lower HIV prevalence

• Countries with greater sex inequalities had poorer health outcomes for both sexes

Investments in adolescent health more generally will have benefits for HIV, and for development more generally

Viner, Lancet 2012
How do these factors combine to increase the vulnerability of young women in SSA to HIV?

**Limited livelihood opportunities:**
- Women’s economic dependence on partner
- Labour migration, separation of families

**Poverty & transactional sex:**
- Young girls have sex with older men to access resources. This seeds HIV into younger age groups

**Gender inequality & violence:**
- Women have difficulty negotiating sex or condom use when economically dependent on partner & fear violence

**Stigma & discrimination:**
- Prevents those most vulnerable to HIV from accessing or supporting HIV programmes
Building an HIV prevention response for young women requires multiple levels of intervention.
The Intervention with Microfinance for AIDS & Gender Equity (IMAGE Study)

CT evaluated Combined Microfinance with participatory training on gender, violence & HIV in Limpopo, South Africa
Significant impacts on violence & HIV risk behaviours over 2 years

Among participants:
- Past year experience of IPV reduced by 55%
- Households less poor
- Improved HIV communication

Among younger women:
- 64% higher uptake HIV testing
- 25% less unprotected sex

No wider community impacts
Zomba cash transfer program, Malawi: Paying girls to stay in school  
Baird, Lancet 2012
Cash transfer scheme to keep girls in school – Zomba, Malawi

$10/month provided to in and out-of-school girls (13-22 yrs)

(Baird et al., 2010 & 2012)

35% reduction school drop-out rate

40% reduction early marriages

76% reduction in HSV-2 risk

30% reduction in teen pregnancies

64% reduction in HIV risk

Impacts both on HIV and other outcomes

Investment

Outcomes

Slide courtesy of C. Watts
• To determine whether young women who are randomized to receive cash transfers conditional on school attendance have a lower HIV incidence.
• Includes an evaluation of community mobilisation to change gender norms.
• Currently fully enrolled – results 2014.
A gender transformative HIV prevention programme

- 13 participatory three hour sessions & 3 peer group meetings
- Sessions on communication, aspects of sexual health, HIV prevention, relationships and gender-based violence
**Impact of Stepping Stones on incidence of HIV and HSV-2 and sexual behaviour in rural South Africa: cluster randomised controlled trial**

Rachel Jewkes, M Nduna, J Levin, N Jama, K Dunkle, A Puren and N Duvvury

33% reduction of herpes simplex type 2 (HSV-2) in men & women. Did not reduce the incidence of HIV infection among men & women.

**Significantly improved number of reported risk behaviours in young men**

- Significant reductions in intimate partner violence
- Significantly lower proportion of men reported problem drinking and drug abuse after 12 months
- Decrease in transactional sex with a casual partner after 12 months

**No evidence of desired behaviour change in women**

- Increase in certain undesirable behaviours e.g. more transactional sex with a casual partner and suggestion of more unwanted pregnancies after two years
Promising three-month preliminary outcomes

- Men and women’s levels of work and earnings ↑
- ↑ access to social grants for men and women
- ↑ focus from men and women on their main sexual partner,  
  ‒ 23% reduction in transactional sex in the past three months for men
- Women searched for and attempted livelihood activities at a greater rate than at baseline  
  ‒ Fewer reported sex for reward
- Men’s mental health ↑.

Further evaluation for longer term benefit and impact on HIV pending
Mobile phones have been used with success to deliver health and educational interventions, to collect data to monitor programmes, and to deliver cash.

Wirelesstechnology.com; Dietrich, personal communication; Lester, Lancet 2010; Levine, Am J Pub Health, 2008;
Building an effective response for young women in Sub-Saharan Africa

Information & social power

Effective prevention

HIV prevention technologies that work for girls & women

Money, economic skills & opportunities

Adapted from: Brady, Martha. Population Council, 2005
“Medicine is a social science, and politics is nothing else but medicine on a large scale. Medicine, as a social science, as the science of human beings, has the obligation to point out problems and to attempt their theoretical solution: the politician, the practical anthropologist, must find the means for their actual solution...
The physicians are the natural attorneys of the poor, and social problems fall to a large extent within their jurisdiction.”
Acknowledgements

Helen Rees
Charlotte Watts
Glenda Gray
Connie Celum
Audrey Pettifor
Frances Cowan
Connie Celum

Harry Moultrie
Heena Brahmbhatt
Catherine Macphail
Mitchell Warren
Zak Kaufman
David Ross
Lee Fairlie

• http://strive.lshtm.ac.uk
Panel discussion

• What options do we have for HIV prevention in young women in various settings?
• Do we have evidence for interventions that address structural factors in young women?
• What are others experiences of combining interventions for young women?
• What age should we be targeting?
• Where should these interventions be delivered e.g. clinics, schools, communities
• Should we be targeting boys as well as girls? What about older men?
• How can we support the uptake of biomedical interventions?