The role of schools in protecting young women and girls from HIV in southern Africa?

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Education and HIV&AIDS: The “Window of Hope”

- A social vaccine?
- Does increased educational attainment decrease vulnerability to HIV infection?
- Does attending school decrease vulnerability to HIV infection?
- (Can school-based prevention education decrease vulnerability to HIV?)
Outline

- Evidence of the changing relationship between education and HIV
- Theoretical framework for the impact of education on sexual behavior
- Evidence of the impact of school attendance on HIV infection
- Policy implications
Literacy and HIV Prevalence – Southern Africa

\[ y = 0.3545x - 5.6583 \]
\[ R^2 = 0.5066 \]
Why Literacy Rates and HIV Rates are related

- Income disparities
- Employment in the formal sector
- Transport infrastructure
- Urban residence
Population-level associations between education and HIV: Summary of past findings

- The majority of studies investigating this issue have found a positive relationship between education and HIV infection:
  - Uganda (Smith et al., 1999; Kirunga & Ntozi, 1997; Killian et al., 1999)
  - Tanzania (Quigley, 1997; Grosskurth et al., 1997; Senkoro et al., 2000)
  - Zambia (Fylkesnes et al., 1998, 2001)

- Five population-based studies found education had a protective effect:
  - for young women in Zimbabwe (Gregson, Waddell, & Chandiwana, 2001)
  - for men and women in Uganda (deWalque et al., 2005)
  - for women in Cameroon and men in Benin (Glynn et al., 2004)
  - and against HIV-2 infection in the Gambia (Wilkins et al., 1991)

- Other studies found no statistical relationship:
  - Zimbabwe (Gregson et al., 2001)
  - Zambia and Kenya (Glynn et al., 2004)
  - and in 7 of the 27 studies in a review (Hargreaves & Glynn, 2004)
Education and HIV: Two opposing trends

1. The initial increased vulnerability of educated individuals to HIV infection
   - Higher socioeconomic status
   - Mobility
   - Control over sexual behavior
   - Delayed marriage for women

2. Educated individuals better able to change behavior in response to the epidemic
Evidence of Opposing Trends

1. Studies after 1996 more likely to find a protective effect of Education
2. Where data available over time HIV prevalence falls consistently among the most educated

A Social Vaccine?


De Walque and J Whitworth, MRC Uganda (2002)
Evidence of Opposing Trends

1. Studies after 1996 more likely to find a protective effect of Education
2. Where data available over time HIV prevalence falls consistently among the most educated
3. Positive associations between education and HIV weaken over time

Figure 4: Changing association between education and risk of HIV infection over time from serial cross-sectional data collected in Uganda, Zambia, Tanzania and Malawi.
# Secondary Education and Sexual Behavior in Four African Cities

<table>
<thead>
<tr>
<th></th>
<th>Cotonou, Benin</th>
<th>Ndola, Zambia</th>
<th>Yaoundé Cameroon</th>
<th>Kisumu, Kenya</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Condom Use</strong></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><strong>Non-marital sex w/o condom</strong></td>
<td>-</td>
<td>- (women)</td>
<td>- (women)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Causal Sex on day of meeting</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Money for sex (women)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Knowing partner’s age</strong></td>
<td></td>
<td>+</td>
<td></td>
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</tbody>
</table>

Figure 8: Impact of girls’ education on using condoms

- **Upper secondary**: 7.35
- **Middle secondary**: 1.91
- **Lower secondary**: 1
- **Primary**: 3.58
- **Second half primary**: 2.28
- **Half of primary**: 1.47
- **No education**: 1
- **Tertiary**: 7.3
- **Secondary**: 3.7
- **Primary**: 2
- **Not completed primary**: 1
A causal relationship?

- Socioeconomic Status shows a similar relationship with HIV infection (Fortson, 2008)

- Attempts to disentangle SES and education in the relationship with HIV have been inconclusive (Hargreaves and Boler, 2006)

- More evidence require (e.g. follow-up of CCT RCTs, panel data from regional education expansion)
Longitudinal Studies

- KwaZulu-Natal: Among uninfected individuals, one year of education is associated with a 7% reduction in chances of becoming infected over a one year period (Bärnighausen et al 2007)

- Tanzania: 8 year panel data from 20 regions suggests a 1% increase in female primary school enrolment leads to a 0.15% reduction in HIV prevalence (Brent 2005)
HIV and School Enrolment

- Does attending school reduce the risk of HIV infection?
# Stratified Randomized Design

<table>
<thead>
<tr>
<th>Teacher Training on HIV/AIDS curriculum</th>
<th>Uniforms</th>
<th>Total # of schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes 82</td>
<td>163</td>
</tr>
<tr>
<td></td>
<td>No 81</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Yes 82</td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>No 83</td>
<td></td>
</tr>
<tr>
<td>Total # of schools</td>
<td>164</td>
<td>164</td>
</tr>
</tbody>
</table>

Impacts of Each Program on Girls' Behavior

(Percentage change relative to girls in comparison group)

- Dropped out
- Is married
- Is pregnant or has a child
- Is pregnant or has a child with older man
- If begun childbearing: is not married

*Indicates that the difference with the comparison group is significant at 10%
Attitude Towards Behavior

- I believe unprotected sex leads to HIV infection (& pregnancy)
  - Exposure to HIV prevention education in school and through the media
- Literacy
  - Literate women in 32 countries:
    4x more likely to know a healthy looking person can have HIV
    3x more likely to know means of preventing HIV

- I wish to avoid (HIV &) pregnancy
  - Opportunity cost of pregnancy
Impact of Quality of School on Pregnancy

![Graph showing the impact of quality of school on pregnancy rates. The x-axis represents different quality ranges of schools, while the y-axis represents the pregnancy rate. The graph shows a trend where pregnancy rates decrease as the quality of the school increases.]

- Male: Red line
- Female: Yellow line
School Attendance and Sexual Behavior

- Study of ~2000 14-25 year olds
- Young female students less likely
  - To have 2 or more partners
  - To have a partner > 3 yrs older
  - To have had unprotected sex in the last year
- Young male students less likely
  - To have three or more partners
  - To have HIV

Hargreaves et al. (2007). The association between school attendance, HIV infection and sexual behaviour among young people in rural South Africa. *Journal of Epidemiology & Community Health*
Schooling and HIV: Conclusions

- More educated individuals
  - Variability in the relationship between education and HIV infection
  - Our best understanding of this variability is that the relationship has been changing over time
  - Cannot be reliably isolated from effects of SES
- Strong experimental evidence that keeping girls in schools leads to less unprotected sex
- Policy Implication: Increase school enrolment at primary and secondary level, especially for girls
Schooling and HIV: Conclusions

- Dose effect: more education associated with greater reduction in risky behavior.

- Is absolute level of education or relative level of education important?

- Policy implications: An equitable expansion of educational enrolment