The Relationship Between Education and Health Outcomes Among Young People in Sub-Saharan Africa

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Thanks to the generous support of the National Institutes of Health and the people of Rakai.
Objectives and Key Issues

Objectives:
- Describe the relationship between education and health
- Understand how education influences life trajectories leading to HIV and other health outcomes

Key Issues:
- Life transitions, trajectories, and life goals among youth
- Effective HIV prevention programs for youth
- Education and social policy interventions
What is Education?
**Education and Health**

**Education is:**
- Strong predictor of health: children, mothers, adults
- Knowledge and health literacy
- Social and economic empowerment
- Globally, rising education access and attainment: improving health status
- Education perceived as a gateway social advancement
  - Families, political leaders
- Demographic transition: increased schooling, delay in childbearing/marriage, increases in economic opportunities for women
Adolescents: Education and Health

- Education is measured as:
  - Educational achievement
  - Staying in school
  - Connectedness to school
  - Educational attainment of parents
- Reduced adolescent risk taking
- Improved health outcomes
  - Teen fertility, HIV
  - Mental health
Barriers to Education

Adolescents:
- Poverty
- Orphanhood
- Family instability
- School failure
- Access to schools
  - Tuition and school fees
  - Government support
Education and HIV

- **Early in the epidemic**
  - Greater education: ↑ HIV risk among adults
  - Increased mobility, greater access to sexual partners

- **Later in the epidemic**
  - Greater education: ↓ HIV risk
Why Economic Empowerment?

- Children **growing up in poverty will, in most cases, remain poor**
- Poverty constitutes **an important risk factor for teen’s and young people’s overall health, including physical health & sexual risk taking**
- Poverty is **related to mental health functioning**
- Poverty negatively impacts families’ ability **to care and support** children
Economic Empowerment, Education and Health

- Increase HH economic resources (MF)
- Increased Financial Stability
- Increase Access and Engagement with Education Opportunities
- Better Educational Outcomes and Positive Health Behaviors
Uganda

- **Population:** ~35 million  
  (World Bank, 2011)
- **HIV prevalence rate:** 6.7%  
  (Government of Uganda, 2012)
- **1.2 million AIDS-orphans**  
  (below 18 years)  
  (UNICEF, 2012)
Rakai District

Site of major civil war activities in the 1980s

Major north-south trucking routes in East Africa

“Slim Disease” (AIDS) first discovered in 1984

Rakai Health Sciences Program

Economic Empowerment programs
Youth Risk for HIV Infection, Globally

- Early sexual initiation
- \(\uparrow\) number of sexual partners/ sexual concurrency
- Inconsistent use of barrier protection
- Male circumcision
- Sexually transmitted diseases
- Community HIV prevalence and viral load

- Poverty and commercial sex work
- Power dynamics and women’s equality
- Educational and vocational opportunities

- Sexual education, other prevention programs and policies
Rakai Youth Project
Specific Aims

- **SA 1:** Explore changing patterns of HIV incidence among youth 15-24 years old within the Rakai District of Uganda and assess continuum of biopsychosocial risk factors on HIV incidence over time

- **SA 2:** Explore how shifting focus of HIV policies and programs in Uganda has influenced HIV risk and protective factors among youth in Rakai

The Rakai Youth Project is using mixed methods:
- Quantitative data from Rakai Community Cohort Study
- New qualitative data: indepth interviews newly infected HIV+ youth and matched HIV- controls
Biopsychosocial Framework for Rakai Youth Project
Rakai Community Cohort Study (RCCS)

- 1994 – ongoing “open” cohort, 50 communities currently
- 43 communities under continuous annual surveillance
  - Considerable out/in-migration: ~17%/year
- Annual survey: all consenting residents 15-49 (n~12,000)
  - Interview: behaviors, sex networks, health status, service utilization, etc.
  - Biological samples, including HIV and selective STI testing
- Participation rate:
  - > 90% in all years
  - Specimen collection >95% among participants
<table>
<thead>
<tr>
<th>Trends in HIV Incidence and Risk Factors</th>
<th>Rakai Youth Project</th>
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<tbody>
<tr>
<td><strong>Rakai Community Cohort Study (RCCS) data</strong></td>
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<tr>
<td>• Data from youth 15-24 years (~5500 per round)</td>
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<td>• RCCS, rounds 1-14, 1994-2011</td>
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<tr>
<td>• Survey data on demographic, behavioral, and biological risk and protective factors</td>
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<td>• New HIV infections within specific intervals</td>
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<td>○ For example, between round 6 and 7, or 7 and 8</td>
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<td>○ HIV status measured at the beginning and end of interval</td>
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## RYP Qualitative Studies

### Ethnographic Case-Control Study (Phase 1)
- In-depth Life History interviews
- Incident cases matched with controls: age, marital status, & region
- Life goals, pregnancy/parenthood, HIV risk, sexual partnerships
- 30 matched sets (n=60)
- 6 unmatched HIV- teens
- 22 married, 22 never married, 16 previously married

### Prevention Perceptions Across Generations (Phase 2)
- Understand young people’s interpretations of, and psychological and behavioral reactions to, the changing landscape of Uganda’s HIV-prevention policies, programs, and technologies
- 4 generations of prevention programs
- Focus groups/indepth interviews
HIV Risk Factors for Rakai Youth

Risk factors for incident HIV infection:

- Multiple partners, sexual concurrency, partner(s) from outside community
- Marital dissolution
- Trading village residence
- STI symptoms
- Alcohol use (among men)

Protective factors:

- School attendance

Santelli et al JAIDS 2013
Hope and Realities in the Context of HIV: Youth Transitions in Rakai, Uganda

Mariko Rasmussen, John Santelli, Sanyukta Mathur, Jenny Higgins, Neema Nakyamj, Fred Nalugoda

- Life history interviews
- Explored aspirations for school and work, desire for marriage, transition to sexual activity, children, and relationship context
- Compared aspirations to realities
- Used grounded theory
School and Work

- **Aspirations:**
  - Young people, regardless of HIV status, hoped to complete secondary school or go to university.
  - The most common work goals were to become a teacher or health worker (nurse).

- **Reality:**
  - Young people, regardless of HIV status, unable to reach their aspirations for school, primarily due to money.
  - Many young women, regardless of HIV status, did not continue their education due to pregnancy.
    - "There was money but they refused to take me back to school... Because I became pregnant they refused to take me back to school."
Marriage

- **Aspirations** (regardless of HIV status):
  - Most young people had a goal of marriage and children
  - Young people hoped to marry in official church marriages

- **Reality**:
  - None met their goal of church marriage, due to financial constraints
  - Some HIV+ young women married because they became pregnant
  - HIV+ young women have more negative ideation of marriage
Trends in HIV Acquisition and Risk and Protective Factors, Rakai, 1999-2011

Declines in traditional risk factors for HIV
- Sexual experience, multiple partners, circumcision

Considerable increases in school enrollment
- Consistent protective factor
- Tied to changes in national education policy
- Universal primary education, 1997
- Universal secondary education, 2007
HIV Incidence Among Youth, Rakai 1999-2011

Incidence Rate per 1000 person-yrs

- Females 20-24
- Males 20-24
- Females 15-19
- Males 15-19

RCCS Survey Round

** p < 0.05
ns - not stat. sig.
Trends in Risk Factors and Social Context among Adolescents, Rakai, Uganda, 1994-2011

- Trends over time prevalence of sexual behaviors
- Change over time in prevention and treatment
  - Antiretroviral treatment
  - Health education
  - Male medical circumcision
- Prevalence of risk and protective factors
  - Education
  - SES
  - Orphanhood
  - Religion?
Increases:
- School enrollment
- SES
- MMC (> 2008)

Decreases:
- Alcohol use/ 30 days

Little change:
- Rural residence or tribal affiliation

Complicated change:
- Religion
School Enrollment by Age, Women, 19-24 years, 1994-2011

UPE (1997)
Trends in Risk Factors and Social Context among Adolescents, Rakai, Uganda, 1994-2011

- Orphanhood
- Government Policy (UPE)
- Economic Development
- SES
- Schooling
- [Parental Education]
Conclusions
School Enrollment among Rakai Youth

- Rising sharply over the past 20 years
- School enrollment a strong protective factor
  - Sexual initiation
  - HIV
- Education is strongly influenced by
  - Rising SES
  - Government policies
  - Family and adolescent aspirations
  - Orphanhood
Implications
Education among Rakai Youth

- Education a predictor of health status across lifespan
- Education represents knowledge but also social and economic empowerment
- Efforts to keeps adolescents in school may have multiple positive effects
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Trends in Risk Factors and Social Context among Adolescents, Rakai, Uganda, 1994-2011

HIV

- School Enrollment
- Concurrency/Multiple partners
- ART and Circumcision
- Alcohol Use
- STI
## Initiation of Sexual Intercourse among Adolescents, Rakai, Uganda, 1994-2011

### Research Questions:
- What risk and protective factors are associated with sexual initiation?
- What risk and protective factors are associated with trends in sexual initiation?

### Risk and Protective Factors:
- School enrollment
- Orphanhood
- SES (household assets)
- Village/rural residence
- Alcohol use/30 days
- Religion/ Tribe
- Male medical circumcision
Initiation of Sexual Intercourse among Adolescents, Rakai, Uganda, 1994-2011

Research Method:

- Trends over time prevalence of sexual experience
- Prevalence of risk and protective factors
- Trends over time in risk and protective factors
- Adjustment by single year of age structure
- Multivariate logistic regression with GEE
- **Outcome** = initiation of sexual intercourse between survey rounds
Sexual Experience by Age, Women 15-24 years, 1994-2011
Sexual Experience by Age, Men, 15-19 years, 1994-2011
Analyses

- Trends examined separately for
  - Women and men
  - 15-19 year olds and 20-24 year olds
  - All youth and sexually experienced youth
- Assessed change over time in
  - HIV prevalence and incidence
  - Risk and protective factors
- Trends in annualized incidence rates were tested using Poisson regression
- All bivariate and multivariate analyses adjusted for age
- Interaction terms assessed for trends in incidence by risk factor
- Decomposition analyses assessed attributable change
HIV Prevalence Among Youth, Rakai 1999-2011

- Females 20-24 years
- Females 15-19 years
- Males 20-24 years
- Males 15-19 years

+ $p < 0.10$

*** $p < .001$

ns - not stat. sig.

RCCS Survey Round

Two or More Partners in Last 12 Months Among Sexually Experienced Youth, Rakai 1999-2011

Males 20-24

Males 15-19

Females 15-19

Females 20-24

**  p < 0.05

***  p < .001

RCCS Survey Round

Concurrent Sexual Partners at Time of Interview Among Sexually Experienced Youth, Rakai 1999-2011

- Males 20-24
- Males 15-19
- Females 20-24
- Females 15-19

** p < 0.05
*** p < 0.001
ns - not stat. sig.
Circumcision Among Young Men and Partners of Female Respondents, Rakai 2002-2011

*** p<.001
Ever Had Sex Among Youth, Rakai 1999-2011

- Females 20-24
- Males 20-24
- Females 15-19
- Males 15-19

*** p<.001

RCCS Survey Round
Currently a Student Among Youth In Rakai, 1999-2011

- Males 15-19
- Females 15-19
- Males 20-24
- Females 20-24

* *** p<.001
Decomposition of Trend in HIV Incidence among 15-19 year olds

Decline in sexual experience
• 100% is attributable to increased proportion of teens in school

Decline in HIV incidence
• 93% is attributable to the decline in sexual experience

Decline in HIV incidence
• 61% is attributable to increased proportion of teens in school
Implications III

HIV prevention for youth in Sub Saharan Africa

- Male circumcision
- Reduction in sexual partners and sexual concurrency
- Delay in sexual initiation
- Condoms

Also focus on

- Social transitions such as marriage and leaving school
- Education, Education, and Education!
Relationship Context

- **Aspirations:**
  o Young men have expectations for sexual exclusivity from their partner.
    “When she started involving in promiscuity/risky sexual behaviors, I had to separate with her.”

- **Reality:**
  o Young women do not expect their partners to be sexually exclusive, assuming that men have multiple partners.
    - “Men are never stable he may get another partner where he is, he may get one or two partners...”
  o HIV+ young people reported more current sexual partners than HIV-negative young people; HIV- young women reporting the fewest.
  o Young people, regardless of HIV status, exchange or receive gifts and money in relationships.
    - Most are tokens of love and used to establish a relationship.
    - Not a form of coercion.
Distribution of RCCS Females 15-24 by Age
Rakai 1999-2011

R6  R7  R8  R9  R10  R11  R12  R13  R14

RCCS Survey Round

20-24  15-19
Uganda: Median HIV Prevalence, Pregnant Women

The “Uganda Success Story”

- Political leadership and mobilization
- Zero Grazing
- ABC or DEF?
  - Abstinence, Be faithful, condoms
  - Death, Epidemiology
- Worrisome rise in HIV prevalence (6.4% to 7.3%) from 2005 to 2011
Quantitative

1. Risk Factors for incident HIV infections (*Santelli*)
2. Risk factors for incident vs. prevalent infection (*Edelstein*)
3. Trends in HIV Infection and HIV Risk Factors (*Santelli*)
4. Trends in mobility/migration (*Schuyler*)
5. Mobility/migration and HIV Incidence (*Edelstein*)
6. Partner risk analysis (*Wei*)
7. STD/GUD analysis (*Aliabadi*)
8. Impact of schooling on HIV prevention (*Helleringer*)
Educational Aspirations and Education Policy

Educational aspirations high, completion low
- Primary reasons for leaving school are economic

Being in school a significant protective factor
- Decrease in sexual experience
- Decreased HIV incidence if sexually active

Public policy change
- Universal primary education, late 1990s
- Universal secondary education, late 2000s