Girls' Education and HIV Risk: Evidence from Uganda

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June 10, 2019

HIV/AIDS in Uganda

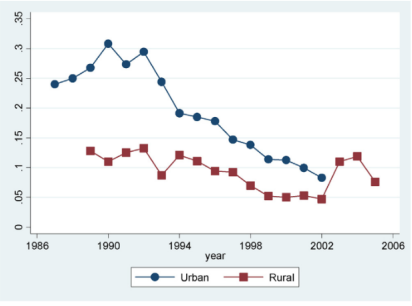
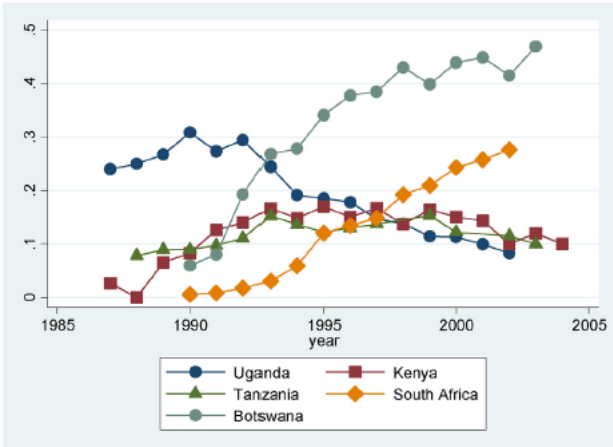


Fig. 1. Median HIV prevalence among pregnant women, Uganda. *Notes*: Data are from the UNAIDS Uganda Epidemiological Fact Sheets on HIV/AIDS from 2004, 2006 and 2008. Median annual prevalence is from antenatal clinics that performed surveillance HIV testing.

- Understanding the decline of HIV in Uganda in the late 1990s
- Much had been written about ABCs

HIV/AIDS in Uganda



HIV/AIDS in Uganda

- Decline in Uganda was unique among countries in East and South Africa at that time.
- Largest declines among young women.
- Young women report abstaining from sex more often and becoming more educated – are these phenomena related?
- Data – DHS Uganda, Census Uganda, ANC HIV Data, Proprietary HIV data

Predicting Virginity

$$Virgin_{icd} = \beta_0 + \beta_1 SchoolEnrollment_i + X_i'\beta_2 + X_c'\beta_3 + \gamma_d + \epsilon_{icd}$$

Specification	(1) Unconditional	(2) Individual and locational controls	(3) (2) +Wealth proxy	(4) (2) +HIV info proxy	(5) (2) + Addnl controls & sample restrictions
School enrollment	0.613***	0.412***	0.410***	0.412***	0.381***
	(0.025)	(0.028)	(0.028)	(0.028)	(0.031)
Distance to nearest urban center		-0.0002	-0.0001	-0.0002	-0.0002
		(0.0003)	(0.0003)	(0.0003)	(0.0004)
Health care access		-0.003	-0.0001	-0.003	0.004
		(0.014)	(0.0003)	(0.014)	(0.016)
Catholic		-0.003	-0.002	-0.002	-0.003
		(0.013)	(0.013)	(0.013)	(0.015)
Baganda		-0.0009	-0.005	-0.001	-0.023
		(0.017)	(0.017)	(0.017)	(0.015)
Female-headed			0.062***		0.069***
			(0.016)		(0.020)
HIV information				-0.016	-0.030*
				(0.014)	(0.016)
Year of birth FE	N	Y	Y	Y	Y
District FE	N	Y	Y	Y	Y
Sample	Full	Full	Full	Full	Restricted
No. observations	3176	3018	3018	3018	2178
No. clusters	295	282	282	282	279
R-squared	0.27	0.46	0.47	0.46	0.49

Instrument Strategy

- IV using distance to secondary school at the cluster level
- Relevance assumption ✓
- Exclusion restriction **?**
  - Schools and households not randomly allocated across geographies.
  - Argue missionaries determined school location.
    - But missionaries also founded health centers and spread Christianity.
  - Use distance from cluster not household.
- Check instrument "balance"

Balance Table

	(1) No controls	(2) With controls
Length of time at residence	0.103 (0.051)	(0.053 (0.040) [6.04]
Age	0.022** (0.009)	0.016* (0.009) [19.39]
Baganda ethnic group	-0.11** (0.003)	-0.001 (0.001) [.210]
Catholic	0.006** (0.003)	0.002 (0.003) [.411]
Distance to market/urban center	N	Y
Health care access	N	Y
District FE	N	Y

Balance Table

	(1) No controls	(2) With controls
AIDS information	-0.004** (0.002)	0.0001 (0.002) [.809]
Stopped schooling due to pregnancy	-0.002** (0.0007)	-0.0006 (0.001) [.057]
Female head of household	-0.003** (0.001)	-0.002 (0.002) [.212]
Distance to market/urban center	N	Y
Health care access	N	Y
District FE	N	Y

IV estimates: First Stage for School Enrollment

Specification	(1) Unconditional	(2) Individual and locational controls	(3) (2) + Wealth proxy	(4) (2) +HIV info proxy	(5) (2) + Addnl controls & sample restrictions
Distance to secondary school	-0.007***	-0.005***	-0.004***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Distance to nearest		-0.0005	-0.0005	-0.0005	-0.0008*
urban center		(0.0004)	(0.0004)	(0.0004)	(0.0004)
F-stat	18.7	6.5	6.3	6.5	6.2

IV estimates: Two-Stage Least Squares

Specification	(1) Unconditional	(2) Individual and locational controls	(3) (2) + Wealth proxy	(4) (2) +HIV info proxy	(5) (2) + Addnl controls & sample restrictions
School enrollment	0.728***	0.968***	0.937***	0.966***	0.862***
	(0.197)	(0.350)	(0.350)	(0.347)	(0.351)
Distance to nearest urban center		0.0003	0.0003	0.0003	0.0003
		(0.004)	(0.004)	(0.004)	(0.0006)
Catholic		0.009	0.008	0.009	0.008
		(0.017)	(0.017)	(0.017)	(0.019)
Baganda		-0.031	-0.032	-0.031	-0.057
		(0.028)	(0.027)	(0.028)	(0.036)
Female-headed			0.051**		0.053
			(0.023)		(0.027)
HIV information				-0.027	-0.046
				(0.017)	(0.021)
Year of birth FE	N	Y	Y	Y	Y
District FE	N	Y	Y	Y	Y
Sample	Full	Full	Full	Full	Restricted
No. observations	3176	3018	3018	3018	2179
No. clusters	295	282	282	282	279
R-squared	0.26	0.28	0.29	0.28	0.39

Mechanisms

- Why might education change abstinence?
  - Incarceration effect.
  - Changes in discount factor.
  - Aspiration of career outside home.
  - We cannot tease these apart.
- On the other hand, sugar daddy may pay for schooling.

Uganda Affirmative Action Program

- Last part of paper suggests some of the some of the increase in secondary education among young women in response to an Affirmative Action program in 1990 which added 1.5 points to college admission exam.
  - Average score about 20
- Female enrollment in Makerere University doubled from 20 percent to 50% in response to the policy

Triple Difference

$$S_{idk} = \beta_0 + \sum_k \alpha_k age_i + \sum_d \delta_d district_i + \beta_1 female_i + \sum_k \zeta_k [age_i \cdot ln(dist)_i^{-1}] + \beta_2 [ln(dist)_i^{-1} \cdot female_i] + \sum_k \mu_k [age_i \cdot female_i] + \sum_k \lambda_k [age_i \cdot ln(dist)_i^{-1} \cdot female_i] + \beta_3 P_{dk} + \epsilon_{idk}$$

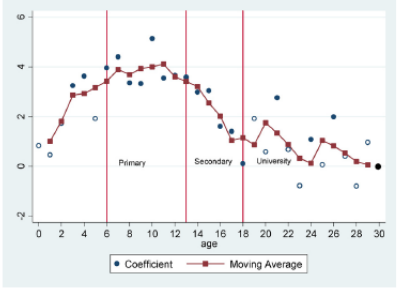


Fig. 5. Effect of affirmative action on girls' secondary school completion. *Notes*: This figure plots the triple interaction coefficients and their 3-year moving average from Eq. (3). The sample includes all men and women in the 2002 Uganda Census between the ages of 0 and 30 in 1990, the year in which an affirmative action policy granting women preferential treatment in their application to public Universities was enacted. The vertical lines represent the approximate cutoffs between primary, secondary and University education. Standard errors are clustered at the district level. Filled in circles are coefficients significant at <10 percent level.

- Compare...
  - Younger vs. older (only younger benefit to AA program).
  - Nearer vs. farther to university.
  - Female vs. male.

Policy Implications

- Results support idea that encouraging girls to stay in school delays sexual debut and reduces lifetime risk of HIV.
- Does this imply gender-targeted education policies are an effective way to curtail HIV?
  - Greater supply of educated women may lead to more female policymakers promoting equity (Duflo and Chattopadhyay 2004).
  - If men prefer less-educated spouses, this could tighten the marriage market.