Mothers' perceived HIV status and children's schooling in rural Mozambique: the role of self-rated health

Luciana Luz (*Luciana.Luz@asu.edu*) and Victor Agadjanian
Center for Population Dynamics, School of Social and Family Dynamics, Arizona State University, United States

Data were collected and analyzed with support from the Eunice Kennedy Shriver National Institute of Child Health & Human Development, grant R01HD058365

Introduction

The effects of the HIV epidemic on child outcomes have received considerable attention given their implications for children's well-being and long-term human capital development. Empirical evidence shows that in areas heavily affected by the HIV epidemic, parental decisions on investments in child quality are influenced by changes in household income, shifts in household labor demands and declines in parents' expected longevity. Moreover, in settings with high HIV prevalence, constant exposure to risk of infection may induce parental behavior regarding children even among the non-infected population. Individuals who perceived themselves as being at higher risk of infection update their investment decisions based on their expectations for the future in the presence of HIV.

However, with increasing access to antiretroviral therapy (ART) and knowledge about the disease, it is likely that this relationship varies depending on individual's health conditions. The impact of perceived HIV status on schooling may vary according to the way infection affects parents' well-being, their survival expectations and productivity. On the one hand, perceiving themselves as having lower chances of surviving to older ages may discourage parents from investing in their children's education since they may not be able to see the returns (Becker and Lewis 1973). On the other hand, if parents derive utility from their children's well-being, they

may be more likely to invest in their education while they live in order to ensure their children's future (Becker 1981). In any case, perceptions about how their health status is progressing with time are likely to be important when parents who think they might be HIV positive update their survival prospects, or anticipate their future ability to work.

In rural Mozambique, HIV prevalence rates are high and economy is based on household production. In this context, changes in parental perceived status and health conditions can have an important impact on the opportunity costs of sending children to school, as well as on perceived future returns of investments in education. However, because Mozambique is experiencing rapid changes in access to ART, the association between HIV status and poorer health outcomes and lower survival prospects may no longer be as straightforward.

The present study investigates the role of maternal perception of health condition in the association between perceived HIV status and investments in children's schooling in rural southern Mozambique. We use data from two waves of the longitudinal study *Childbearing Dynamics in a Setting of High HIV Prevalence and Massive ART Rollout* conducted in 2009 and 2011. Taking advantage of the longitudinal design, we analyze how women's perceptions of their health conditions interact with the perceptions of HIV status in 2009 and 2011, influencing investments in children's schooling in 2011. Our preliminary results suggest that the effect of perceived HIV status on children's chances of enrollment and school attendance varies depending on women's perception of their health condition. Children with mothers who think they might be HIV positive and perceive their health as being consistently poor or deteriorating between 2009 and 2011 are less likely to be enrolled, and tend to have higher school absenteeism.

Background

Various studies have documented the negative effects of the HIV epidemic on children's education, discussing the consequences of the wealth shock caused in households affected by HIV. There is evidence that children from households affected by HIV have lower school enrollment and attendance since they are more likely to be taken out of school to provide care for ill relatives, or to assume a number of roles in the household economy in order to replace an ill or deceased member of the family (Robson 2000, Yamano and Jayne 2005, Yang 2006, Floyd et al. 2008).

In addition to affecting household's present material conditions and children's opportunity costs, HIV can induce changes in parents' decision-making process regarding investments in schooling. In a context of high HIV prevalence and increased adult mortality, parents may downgrade their expectations of their own survival chances and those of their children's (Castro et al. 2010). And if investments in children's schooling are motivated by its long-term returns, lower perceived life expectancy can lead to lower investments in children's education once the time horizon to see the returns is shortened (Soares 2005, Grant 2008) .

Kalemli-Ozcan (2006) presents evidence of adapting fertility and investments in children in high HIV prevalence settings. She shows that living in a context of high mortality caused by HIV is related to increased fertility which leads to reduced investments in children's education, consistent with the quantity-quality trade-off mechanism (Kalemli-Ozcan 2006). Parents' precautionary response to the lower returns of education due by higher mortality consists in increasing their demand for children, causing a reduction of the resources available to each child

within the household (Kalemli-Ozcan 2006). Furthermore, Castro et al. (2005) finds that higher levels of perceived HIV risk are associated with lower investments in child quality, with no significant effect on quantity.

In contrast, there is also evidence that lower perceived chances of survival may increase parental investment in children's education. Using longitudinal data from Malawi, Grant (2008) shows that school participation was higher among children whose mothers had a medium to high perceived likelihood of being HIV positive. According to her, women would act altruistically towards their children based on their interpretation of their risk profile. Investing in their children and ensuring they attend school for as long as possible is a strategy to safeguard their future in anticipation to future health shocks (Grant 2008). Similarly, a qualitative study in South Africa indicates that HIV-positive mothers' decisions on children's education are influenced by their children well-being (DeLannoy 2005). According to the study, although mothers have expectations about future returns of their investments in education, they do not focus on intergenerational transfers but rather on their children's future chances in the labor market and their ability to provide for their own families (DeLannoy 2005).

These findings imply that perceived HIV risk acts as perceived life expectation when it comes to its effects on individual decision-making process regarding investments in education. However, there is no explicit consideration to perceived health conditions and how changes in individual well-being may affect the relationship between HIV and investments in children's human capital. The effect of perceived HIV risk on children's education investments may be influenced by parents' assessments of their longevity and productivity based on their perceived health status. Moreover, the rapid increase in availability of ART in sub-Saharan Africa in recent years may

have weakened the effect of parents' perceived HIV risk on decisions about investments in children's education because treatment can change their perceived longevity.

Hypotheses

This paper will test hypotheses about the association of mother's perceived HIV status and perceived health status with investment decisions in children's education, and the extent to which this relationship varies depending on how women's perceived health conditions and perceived risk change over time and depending on child's sex.

More specifically:

- H1a. Women with higher perceived HIV risk and deteriorating health status may be less likely to invest in their children's education (because of reduced expectations of long-term returns).
- H1b. Women with higher perceived HIV risk and deteriorating health status are more likely to invest in their children's education (as insurance for their future well-being in case of parental sickness or death).
- H2a. Women with higher perceived HIV risk and deteriorating health status may be more likely to invest in their sons' education (because the expected future returns for their education are higher in that context).
- H2b. Women with higher perceived HIV risk and deteriorating health status may be less likely to invest in their sons' education (because the current opportunity costs of sending them to school is higher if health status is deteriorating and labor replacement is needed).

- H3a. Women with higher perceived HIV risk and deteriorating health status may be more likely to invest in their daughters' education (because they will try to ensure they attend school while she is alive, knowing that girls are more likely to drop out of school later).
- H3b. Women with higher perceived HIV risk and deteriorating health status may be less likely to invest in their daughters' education (because future returns to female education are lower).
- H4. Women who change their perception of risk over time are less likely to invest in their children's education (because of greater uncertainty about their survival prospects), and are more likely to rely on perceived health status to make decisions about their children's schooling.

Setting

This analysis tests these hypotheses using data from Mozambique, a country of 23 million inhabitants located in southeast Africa. A former Portuguese colony that gained independence in 1975, Mozambique was battered by a civil war for the first decade and a half of its independent existence. Since the end of the war in 1992 and the deployment of economic structural adjustment programs in the early 1990s, the country has experienced remarkable macroeconomic growth. Yet with an average per capita annual income of $320, life expectancy of 42 years, and female literacy rate of 32%, Mozambique remains one of the poorest and least economically developed nations in the world (World Bank 2009).

Since colonial times, Mozambicans have worked in South African mines, and this legal migration flow continues to date (CEA/UEM 1997; Crush 2001). The area of our study, the Gaza province in southern Mozambique, has particularly high levels of out-migration to South Africa. Migration within Mozambique, particularly from rural to urban areas, has also been growing

rapidly (Jenkins 1993; Knauder 2000). Changing migration regimes have been at the root of transformations of family, kinship, and gender systems.

Mozambique has shown progress in educational indicators, such as literacy and attainment. With the ongoing expansion of the educational system, access to basic education has increased fast, especially in the last decade. Despite the improvement in access to primary education, there is a significant gender gap in indicators related to attendance and conclusion demonstrating girls' disadvantage in enrolling and persisting in school. In 1999, the primary school net enrollment rate (NER)[1] was 47,4% for males and 39,8% for females (Unesco, 2000). Ten years later, NER was already 82% for males and 77% for females (Unicef, 2011). Primary school conclusion rates were 69% for males, versus 48% for females in 2008 (Ministry of Education and Culture, 2011).

Data and methods

Data and analytical sample

The data for the present study come from a representative survey of ever-married women of reproductive age conducted in July 2009 and July 2011 in rural areas of four contiguous districts (total area 5900 square miles, population 625,000) of Gaza province in southern Mozambique.

The sample includes women from 56 villages in 14 districts, based on an early survey conducted 2006. For the 2006 survey, in each selected village (or randomly selected section thereof if a village was large), all households with at least one married woman were canvassed and divided into two groups—those with at least one woman married to a migrant and those with no such women. These two groups were used as separate sampling frames: from each of them 15

[1] Net enrolment rate (NER): ratio of the enrolled school-age group expressed as a percentage of corresponding population.

households were randomly selected. In each selected household a woman was interviewed (in households classified as migrant, a woman married to a migrant was interviewed). The resulting sample consisted of 1680 women (420 per district, 30 per village), more or less evenly split between women married to migrants and women married to non-migrants. In 2009, a second wave of data collection was carried out among women still living within the study area (N=1314, 78% of the 2006 sample). A refresher sample was randomly selected to replace women lost to follow up and the final sample in 2009 was formed by 1772. The third wave in 2011 interviewed 1937 women, 1591 of them were present in the previous wave in 2009, and 253 composed a refresher sample in 2011. In this study, we restrict our sample to women who were present in 2009 and 2011, since we make use of information in both years.

The survey collected detailed demographic and socioeconomic information, including women's perceptions of their HIV risk and their partners', perceptions of their own health status, experience with HIV testing and treatment, pregnancy histories, reproductive intentions, husband's migration history, household material status and household composition. In 2011, the survey also collected detailed information on schooling for all member in the household between 5 and 18 years old, and vaccination history and anthropometrics for children below age 5. In parallel with the individual women's survey, a community survey was carried out in each of the villages in the sample and includes information on school characteristics.

The analytical sample of this study consists of 2162 children from 6 to 14 years old who were identified in the household roster as being the respondent's children. The average number of children per household in the analytical sample is 3.36. Because we cannot identify the main caregiver for the non-biological children in the extended family context, and respondent's characteristics and perceptions regarding HIV risk and health may not be directly associated to

their non-biological children, we restrict our sample to biological children only. In 2011, 79% of children between 6 and 14 years old living in the households included in the total sample were respondent's biological children. Information on the relationship to the respondent and children's sex and age is drawn from the household roster, while our two outcomes of interest - school enrollment and absenteeism - are drawn from the education module present only in the 2011 wave of the survey.

Dependent variables

We use two different measures of current children's schooling: enrollment and absenteeism. Information on school enrollment comes from the question "Is he/she studying in the current year?", asked to the respondent regarding every member of the household between 5 and 18 years old. School absenteeism is measured using respondent's report on how many days the child was absent from school in the past 4 weeks.

Enrollment rates in Mozambique are quite high, and more refined indicators of education such as attainment and age-grade distortion may be more sensitive measures of children's exposure to schooling. However, current enrollment and absenteeism are measures of more immediate decisions on children's schooling, and are more subject to be affected by recent changes in parent's perceived risk of infection and health shocks.

Perceived HIV status

The perceived HIV status variable is a measure of women's assessment of their likelihood of being infected. Respondents were asked "Speaking about yourself, in your opinion, is it very likely, a little likely, or almost impossible that you already have the AIDS virus?". In addition to the options included in the sentence, don't know" and "knows she is HIV+" were also recorded.

Women were also given the option to refuse to answer, but all respondents answered the question in 2009, and 3 (0.16%) declined to answer in 2011. Similarly to Hayford, Agadjanian and Luz (2012), we combine "knows she is HIV+", "very likely" and "little likely" to create a single indicator of "probable HIV+". Because the nuances between very likely and little likely are very subtle in this context, these two categories were combined into one.

The full paper will make use of women's perceived HIV status in 2009 and 2011. The 2009 measure may have a more significant impact on current educational outcomes since it preceded the parental decisions about their children enrollment, made in the beginning of 2011[2]. In addition to that, possible health and wealth shocks caused by HIV during the 2 years gap between surveys may be associated to changes in decisions about children's education. However, a significant proportion of women changed their assessment on perceived HIV status between 2009 and 2011, indicating that they are constantly revising their perception of the likelihood of infection. 59.82% of women who considered themselves as "probable HIV+" in 2009 downgraded their perceived risk in 2011. In contrast, 43.74% of women who considered being impossible they were infected or could not assess their risk of infection in 2009 reported an increased perceived likelihood of having HIV in 2011. Women who are downgrading or upgrading their perceived risk of being infected may act differently regarding their investments in schooling than women who consistently perceive themselves as likely to be infected or not. To further investigate the effect of the uncertainty on HIV perceived status, the final paper will account for changes in "probable HIV+" between 2009 and 2011.

Perceived health status

[2] School year in Mozambique is January-December.

Our measure of perceived health status is based on women's 2009 and 2011 reports on their present health conditions and identifies women who perceive themselves as having a consistently bad health or deteriorating health conditions. All women were asked "How do you consider your health: good, so-so, or bad?". We consider as having perceived deteriorating health those women who answered "so-so" or "bad" in 2009 and 2011, and those who changed their perception from "good" in 2009 to "so-so" or "bad" in 2011. As shown in Table 2, 26.72% of women have perceived deteriorating health status, of which 34.58% fall into our probable HIV+ category in 2009.

To capture how perceived general health status affects the relationship between perceived HIV status and decision-making process on children's education, we add an interaction term between "perceived deteriorating health status" and "probable HIV+". The full paper will also contemplate other possible linkages of transitioning health conditions and changes in perception of risk from 2009 to 2011 on children's schooling decisions in 2011.

Controls

In addition to these main independent variables of interest, a set of control variables related to children's educational outcomes and perceived HIV status and health status is included in the multivariate analysis. Models include characteristics known to be associated with child's educational outcomes (Buchman and Hannum, 2001; Knodel and Wongsith, 1991) such as: child's age, child's sex, number of children in primary school ages living in the household (aged 6 to 14), mothers' age and mother's educational level in 2011.

To account for differences in living conditions, we create an index of household's standard of living indicating ownership of selected consumer goods (radio, bicycle, car or motorcycle) in

2009. Another measure of household wealth is roof construction material (grass or palm branches vs. metal or plastic sheets) and cattle ownership. Because men's labor migration to South Africa and migration experience has been shown to be related to HIV status in Mozambique (Agadjanian, Arnaldo, and Cau 2011), we include a control for partner's migration status in the models.

Multivariate models also control for supply characteristics, such as the availability of primary and secondary school in the village. Finally, we include distance from the village to nearest town to account for differences in development level across communities.

Methods

The analysis presented here uses logistic regressions to estimate the probability of being enrolled in 2011, and negative binomial regression to model school absenteeism. Because of the design of the survey sample, in which the primary unit of analysis was women, observations are not independent when we change the focus to children. Children in this analysis are clustered within the respondent's specific household, and women's and households' characteristics are the same for children living in the same household.

In order to deal with this non-independence in our observations, the full paper will present 2-level models with random intercept and slopes in the first level (child), and random intercepts only in the second level (household). Although we do not present multilevel models in this extended abstract, results presented here have standard errors adjusted by clustering within households.

Finally, one issue with the estimation of factors associated with school absenteeism is that we only observe absence frequency for children who are enrolled. These children are likely to have a

different socioeconomic profile from those who are not enrolled, and their parents are more likely to have a distinctive pattern of educational investments in relation to not enrolled peers. Therefore, to avoid bias in the estimation of the effect of perceived HIV status and health conditions on children's educational investments, we use Heckman's selection model to account for selection bias the analysis of school absenteeism.

Preliminary results

Table 1 shows the percentage of children enrolled and not enrolled in school for probable HIV+ mothers'. Children whose mothers perceived themselves as having a higher likelihood of being infected are more likely to be out of school than children from mothers' who think it is impossible they have HIV, or who could not estimate their likelihood of being HIV positive.

[Table 1 here]

Table 2 shows the distribution of children's attributes and respondents' characteristics by child's sex. Regarding children educational outcomes, around 94% of children in our analytic sample were enrolled in 2011. Between ages 6 to 14, enrollment is higher among girls (96.79%) than boys (95.10%), although both are higher than the national average. However, these high enrollment rates may not represent consistent investments in children's education. Parents' decision to enroll the child in school is punctual and free of charges. For instance, children's attendance of school on a daily basis involves a number of indirect costs related to transportation, books, and children's time use, which presents more complex tradeoffs for parents to consider when making their investments decisions on their children's schooling than deciding on enrollment. In contrast to high enrollment rates, 32.58% of the children in the analytic sample were absent for at least one day during the four weeks preceding the survey. Among those who

were absent, the mean number of days absent is 2.71. If we were to restrict our analysis to enrollment, the linkage between of perceived HIV status and health conditions and children's schooling could be overshadowed by the weak tradeoff presented by decisions on enrollment.

[Table 2 here]

The multivariate results for enrollment status indicate that boys with mothers experiencing declines in their health conditions have lower likelihood of being in enrolled in school. There is no evidence of a significant direct effect of perceived HIV status on enrollment for the analytic sample, but there is a significant negative effect for "probable HIV+" mothers who have experienced consistently poor health conditions in 2009 and 2011, or whose health have deteriorated in the 2-year interval. For this specific subgroup of women, the conjunction of having poorer health and perceiving themselves as being at higher risk of infection affects the chances of enrollment for their sons, but not for their daughters.

[Table 3 here]

A similar association can be seen on the analysis of factors associated with children's school absenteeism in Table 4. Although there is no significant impact of perceived HIV status on children's school absence, children whose mothers are experiencing a deterioration in their health status are more likely to skip school, which is true for both boys and girls. Moreover, boys living with mothers who think they might be HIV positive, and consider their health to be deteriorating, are more likely to have lower school attendance.

[Table 4 here]

Discussion and next steps

These preliminary findings have shown the importance of considering women's health condition when analyzing the impact of HIV status on children's schooling. The results indicate that, in this specific context, there may not be a direct effect of women's perceived HIV status on investments in children schooling if their assessment of being at risk is not followed by a decline in their health conditions. Women who think they might be infected and perceive their health status to be deteriorating may decrease their investments in their children's education because of changes in the perceived long term returns of education. As they become suspicious of their HIV status and feel their health is worsening with time, women may revise their survival expectations and think about their priorities in the short term.

Although there seems to be an effect of perceived HIV status in the presence of deteriorating health for the total sample regarding enrollment status, overall boys are significantly more affected than girls on both enrollment and absenteeism. To better interpret this gender difference in parental investment, it is necessary to analyze if the negative effect varies with child's age. The full paper will further investigate if this relationship holds for boys from 6 to 9, and 10 to 14 years old separately. For younger children, changes in parental investments in education may be related to delayed school entrance. For older children, the decline in their educational outcomes can indicate changes in children's time use because of an increased demand for child labor within or outside the household followed by maternal illness.

Moreover, the full paper will analyze the role of health conditions in moderating the effect of perceived HIV status on children's schooling for women who are re-evaluating their perceived risk. We hypothesize that women with higher uncertainty about their HIV status will rely more

on their perceived health status to formulate decisions regarding their children's schooling. Women who downgrade or upgrade their risk of infection may use their assessment of health status as a concrete indicator when revising their expectations of survival and productivity for the future.

References

Agadjanian, V., Carlos Arnaldo, and Boaventura Cau. 2011. "Health costs of wealth gains: Labor migration and perceptions of HIV/AIDS risks in Mozambique" Social Forces 89(4): 1097-1118

Agadjanian, V., S.T. Yabiku, and B. Cau. 2011. "Men's migration and women's fertility in rural Mozambique." *Demography* 48 (3): 1029-1048.

Becker, Gary S. (1981). A Treatise on the Family. Cambridge, MA: Harvard University Press.

Becker, G., and Lewis, H. (1973). "On the interaction between the quantity and quality of children" Journal of Political Economy, Part 2: New Economic Approaches to Fertility, 81 (2).

Buchmann, C., and E. Hannum. (2001). Education and stratification in developing countries: a review of theories and research. Annual Review of Sociology, v.27, n.1, p.77-102.

Castro, R., J. R. Behrman and Hans-Peter Kohler (2010). Perception of HIV risk and the quantity and quality of children: The case of rural Malawi. University of Pennsylvania, Population Studies Center, PSC Working Paper No. 23 (2010-08).

CEA/UEM. (1997). The Mozambican Miner: A Study of the Export of Labor. Maputo, Mozambique: Center for African Studies (CEA), Eduardo Mondlane University (in Portuguese).

De Lannoy, Ariane (2005). "There is no other way out": Educational decision-making in an era of AIDS: How do HIV-positive mothers value education? Centre for Social Science Research Working Paper No. 137. University of Cape Town.

Floyd, S., Crampin, A., Glynn J., Madise, N. & Mwenebabu, M. (2007) The social and economic impact of parental HIV on children in northern Malawi: Retrospective population-based

cohort study. AIDS Care, 19, 781-790.

Grant, M. (2008). “Children’s school participation and HIV/AIDS in rural Malawi: The role of parental knowledge and perceptions” Demographic Research. Volume 19, Article 45, Pages 1603-1634.

Hayford, Sarah, R., V. Agadjanian, and Luciana Luz. “Now or never: perceived HIV status and fertility intentions in rural Mozambique” Studies in Family Planning (in press)

Kalemli-Ozcan, S. (2006). AIDS, Reversal of the Demographic Transition, and Economic Development: Evidence from Africa. NBER Working Paper No. W12181.

Knodel, J., Wongsith, M. (1991) Family size and children´s education in Thailand; evidence from a national sample. Demography, v.28, n.1, p.119-131.

Llyod, C. B.; Blanc, A. K. (1996) Children´s schooling in Sub-Saharan Africa: the role of fathers, mothers and others. Population and Development Review 2 (2), 265-298.

Moçambique. (2005). Análise de Pobreza e Impacto Social (PSIA): admissão e retenção no ensino primário: o impacto das propinas escolares. Maputo, Mozambique.

Robson E. Invisible carers: young people in Zimbabwe’s home-based health care. Area 2000, 32:59-69.

Soares, R. (2005). Mortality Reductions, Educational Attainment, and Fertility Choice. American Economic Review 95(3): 580-601.

Unicef. (2011). The State of the World's Children. New York: UNICEF.

United Nations, Division for Social Policy and Development. (1999). The United Nations and Disabled Persons: The First 50 Years. New York: United Nations, Division for Social Policy and Development.

Yamano, Takashi, and T.S. Jayne. “Working-age adult mortality and primary school attendance

in rural Kenya," Economic Development and Cultural Change, 2005, 53(3), 619-54.

Yang, H., Wu, Z., Duan, S., Li, Z., Li, X., Shen, M., Mathur, A., & Stanton, B. (2006). Living environment and schooling of children with HIV infected parent in southwest China. AIDS Care, 18, 647–655.

Table 1: Mothers' perceived likelihood of being HIV positive in 2009, by perceived health status and perceived likelihood of being HIV positive in 2011

	Perceived HIV status in 2009		
	Probable HIV+	Impossible HIV+	Don't know
Deteriorating health status between 2009 and 2011	34.58	22.99	42.43
Perceived HIV status in 2011			
Probable HIV+	40.20	15.82	43.98
Impossible HIV+	22.78	60.06	17.16
Don't know	37.78	22.7	39.52

Source: Childbearing Dynamics in a Setting of High HIV Prevalence and Massive ART Rollout Survey, 2009 and 2011.

Table 2: Distribution of children's attributes and respondents' characteristics, by child's sex

	N	Total	Male	Female
Enrolled in school	2053	94.94	95.10	96.79
School absenteeism				
% never absent	1458	67.42	64.74	70.19
Mean number of absences in the previous month among those who did not have perfect attendance.	59	2.71	2.61	2.69
Child's Characteristics				
Age				
Household's Characteristics				
Household aterial status				
Possessions index=1	836	38.67	38.24	39.15
Possessions index=2	480	22.22	22.63	21.75
Possessions index=3	593	27.42	27.72	27.12
Possessions index=4	253	11.68	11.41	11.98
Dwelling has better roof	1523	70.46	70.58	70.38
Dwelling has precarious roof	639	29.54	29.42	29.62
Size of agricultural land				
Husband not a migrant or not married	1521	70.37	69.78	70.96
Migrant husband	641	29.63	30.22	29.04
Number of children 0 to 5 years old				
Number of children 6 to 14 years old				
Village				
Does not a have primary school	1193	55.19	55.81	54.53
Has a primary school	969	44.81	44.19	45.47
Does not have a secondary school	1579	73.02	73.63	72.41
Has a secondary school	583	26.98	26.37	27.59
Distance to nearest town				
Women's Characteristics				
Education				
No education	563	26.06	26.49	25.62
1 to 4 years	986	45.62	45.25	46.02
5 years or more	612	28.32	28.26	28.36
Age				
less than 25	198	9.15	8.46	9.85
25 to 29	380	17.58	16.53	18.67
30 to 34	625	28.93	29.18	28.67
35 to 39	526	24.35	25.61	23.05
40 or more	432	19.99	20.22	19.76

Source: as for Table 1.

Table 2 (Continue): Distribution of children's attributes and respondents' characteristics, by child's sex

	N	Total	Male	Female
Perceived HIV status 2009				
Probable HIV+	742	34.32	34.04	34.64
Don't know	947	43.78	45.39	42.72
Impossible HIV+	473	21.90	20.57	22.64
Perceived HIV status 2011				
Probable HIV+	895	41.40	41.91	40.84
Don't know	830	38.40	39.39	37.38
Impossible HIV+	437	20.20	18.70	21.78
Perceived health status				
Deteriorating health status between 2009 and 2011	578	26.73	28.43	24.95
Good health status in 2009	1619	74.87	74.65	75.10
Poor health status in 2009	543	25.13	25.35	24.90
Good health status in 2011	1597	73.85	72.73	75.00
Poor health status in 2011	565	26.15	27.27	25.00
N		2162	1093	1069

Source: as for Table 1.

Table 3: Logistic regression[#] (odds ratio) of current school enrollment, 6-14 years old, males and females

	Total	Male	Female
	b (SD)	b (SD)	b (SD)
Child's Characteristics			
Female	3.06(0.89)***	na	na
Age	2.4(1.16)ǂ	0.66(0.68)	8.63(0.00)**
Age squared	0.93(0.02)**	0.98(0.04)	0.88(0.64)**
Household's Characteristics			
Household Material status (omitted: Possessions index=4)			
Possessions index=1	0.44(0.26)	0.41(0.34)	1.46(0.91)
Possessions index=2	0.99(0.66)	1.74(1.65)	1.1(0.59)
Possessions index=3	0.56(0.34)	0.45(0.36)	1.58(0.61)
Precarious roof	0.72(0.22)	0.9(0.35)	1.27(0.93)
Size of agricultural land	1.11(0.11)	1.06(0.15)	1.13(0.77)
Migrant husband	1.85(0.73)	2.14(1.36)	4.22(0.48)
Number of children 0 to 5 years old	0.85(0.08)	0.77(0.1)*	1.24(0.90)
Number of children 6 to 14 years old	1.01(0.09)	0.98(0.12)	1.02(0.53)
Village			
Primary school	0.30(0.09)***	0.28(0.12)**	0.74(0.69)
Secondary school	1.70(0.65)	4.33(2.54)*	1.22(0.48)
Distance to nearest town	0.98(0.00)**	0.98(0.00)**	0.99(0.14)
Women's Characteristics			
Education (omitted: 5 years or more)			
No education	0.28(0.16)*	0.25(0.17)*	0.28(0.06)
1 to 4 years	0.39(0.22)ǂ	0.29(0.20)ǂ	0.22(0.99)ǂ
Age (omitted: less than 25)			
25 to 29	0.00(0.00)	0.00(0.00)	0.00(0.99)
30 to 34	0.00(0.00)	0.00(0.02)	0.00(0.99)
35 to 39	0.00(0.00)	0.00(0.01)	0.00(0.99)
40 or more	0.00(0.00)	0.00(0.00)	0.00(0.56)
Perceived HIV status			
Probable HIV+	1.1(0.49)	1.19(0.71)	1.48(0.89)
Don't know	0.68(0.24)	0.66(0.32)	0.93(0.97)
Deteriorating health status	0.66(0.23)	0.39(0.18)*	1.02(0.77)
Probable HIV+ * Deteriorating health status	0.33(0.19)*	0.21(0.16)*	1.37(0.07)
N	2162	1093	1069

*** p<0.001 ** p<0.01 * p<0.05 ǂ p<0.1

Standard errors are adjusted for clustering of children within households.

Source: as for Table 1.

Table 4: Negative Binomial regression[#] of school absenteeism, 6-14 years old, males and females

	Total	Male	Female
	b (SE)	b (SE)	b (SE)
Child's Characteristics	-0.39(0.16)*		
female	0.13(0.33)	0.1(0.47)	0.07(0.43)
Age	0.00(0.02)	0(0.02)	0(0.02)
Age squared			
Household's Characteristics			
Household Material status (omitted: Possessions index=4)			
Possessions index=1	-0.25(0.27)	-0.57(0.32)ǂ	0.25(0.39)
Possessions index=2	-0.20(0.28)	-0.38(0.33)	0.24(0.4)
Possessions index=3	-0.42(0.28)	-0.92(0.33)**	0.26(0.41)
Precarious roof	-0.02(0.22)	-0.31(0.24)	0.25(0.3)
Size of agricultural land	-0.17(0.07)*	-0.2(0.08)**	-0.12(0.1)
Migrant husband	0.16(0.20)	0.15(0.22)	0.11(0.27)
Number of children 0 to 5 years old	0.04(0.06)	-0.09(0.09)	0.17(0.07)*
Number of children 6 to 14 years old	-0.05(0.06)	-0.05(0.07)	-0.05(0.07)
Village			
Primary school	-0.93(0.24)***	-0.96(0.3)**	-0.83(0.34)**
Secondary school	-0.29(0.23)	-0.3(0.3)	-0.31(0.31)
Distance to nearest town	0.00(0.00)	0.00(0.00)	0.00(0.00)
Women's Characteristics			
Education (omitted: 5 years or more)			
No education	-0.04(0.30)	0.01(0.39)	-0.2(0.4)
1 to 4 years	0.04(0.22)	0.14(0.28)	-0.11(0.31)
Age (omitted: less than 25)			
25 to 29	0.49(0.62)	-0.1(0.65)	1.95(1.09)ǂ
30 to 34	0.39(0.61)	-0.3(0.62)	2.05(1.08)ǂ
35 to 39	0.5(0.60)	0.02(0.63)	1.91(1.07)ǂ
40 or more	0.39(0.62)	-0.22(0.66)	1.97(1.08)ǂ
Perceived HIV status			
Probable HIV+	-0.24(0.26)	0.01(0.32)	-0.71(0.38)ǂ
Don't know	0.07(0.23)	0.1(0.29)	0.01(0.3)
Deteriorating health status	0.73(0.23)**	0.61(0.28)*	0.76(0.31)**
Probable HIV+ * Deteriorating health status	0.55(0.37)	0.86(0.43)*	0.46(0.52)
N	1894	936	958
λ	0.31(2.84)	-0.5(4.02)	0.35(3.82)

*** p<0.001 ** p<0.01 * p<0.05 ǂ p<0.1

Standard errors are adjusted for clustering of children within households.

Source: as for Table 1.