

# Effects of HIV on children and youth's educational attainment

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## Summary of the Dissertation

It has been 40 years since the first cases of HIV were identified. Since then, an estimated 76 million people have been infected globally and about half of these cases have been fatal. The loss of human capital due to morbidity and mortality issues related to the disease has brought about a significant loss to families and economies overall, particularly in SSA, where 70% of HIV-infected individuals reside. Given that there were 1.7 million new HIV infections in 2019, the eradication of this disease is not in sight. Most of these new infections (over two-thirds) are in SSA. Southern Africa contains at least eight countries with the highest HIV infection rates, making the disease endemic to the region. Therefore, the effects of this disease on human capital (i.e., education) are likely to be prevalent and more severe within this region. HIV may affect educational attainment through illness, medical appointments, stigma, and taking care of sick family members. In addition, due to gender gaps in HIV infection, caregiving, and education in general, the effects of HIV on educational attainment may differ by gender. This dissertation aims to examine the effects of HIV on gender gaps in educational attainment by conducting mixed-method studies in Zimbabwe. This process allows for an in-depth examination of HIV issues within the country and highlights how country-specific socioeconomic and sociocultural factors contribute to how HIV affects gender gaps in educational attainment.

While several strides have been made towards HIV treatment globally, about a third of HIV-infected individuals do not have access to treatment. Therefore, effects of HIV on human capital (i.e., education) and the economy overall may still be persistent, particularly in Southern African countries such as Zimbabwe. In addition to the HIV pandemic, Zimbabwe has had economic and political challenges for over 20 years. The combination of a pandemic and extreme poverty may result in a group of people who are more marginalized than others. Moreover, there other gender-specific issues such as early marriage that may further marginalize low-income HIV-positive women and girls. This dissertation examines whether HIV influences intergender and intragender gaps in educational attainment in Zimbabwe. Specifically, does HIV influence gender gaps in education in Zimbabwe? If so, how do HIV and other factors influence these gender gaps?

Several studies have shown that, in general, HIV affects educational outcomes of different groups of people, such as orphans. However, studies that examine whether there are gender gaps in educational outcomes of HIV-affected individuals are limited and have shown mixed results. This dissertation addresses this gap in the literature by examining intergender and intragender gaps in various educational outcomes (i.e., attendance, total years of schooling, level of education, and dropout) of children and youths in Zimbabwe. The strides that have been made towards HIV prevention and testing have helped reduce the prevalence rates. However, due to limited medical care, some people do not always have access to treatment and prevention options. In addition, HIV mainly affects individuals of a lower socioeconomic status. Hence, this dissertation also examines the role of this disease in exacerbating and perpetuating the poverty cycle, and ultimately human capital accumulation. The thesis is comprised of 6 chapters and the contents of each chapter are described below.

## **Chapter 1**

Chapter 1 presents the introduction and the motivation for the dissertation. The chapter highlights the current statistics related to the prevalence of HIV globally, regionally, and in Zimbabwe. The chapter also presents general statistics about gender gaps in educational attainment and how HIV may contribute to these gender gaps. In addition to the exhibition of HIV and education trends over time, the chapter also shows the proportion of people on treatment. Following an explanation of the importance of examining HIV and gender gaps while taking into account socioeconomic issues related to HIV, the chapter provides the aims of the dissertation. These are:

*Aim 1: To systematically review studies that examined the effects of HIV on educational attainment of school-going children globally and identify literature gaps.*

The first aim of the dissertation is to conduct a systematic literature review of studies that analyze how HIV affects educational outcomes of different groups of children in various countries. The review also provides insights on the current work that has been done on examining the effects of HIV on educational attainment and identifies the literature gaps that are to be filled.

*Aim 2: To quantitatively examine intergender and intragender gaps in school attendance of HIV-positive children in Zimbabwe.*

Given the increase in HIV rates among younger girls in SSA, it is important to examine whether school attendance of HIV-positive girls is different compared to that of HIV-positive boys (intergender) as well as HIV-negative girls (intragender). This issue is explored in Chapter 3 of this dissertation.

*Aim 3: To quantitatively examine causal effects of HIV on educational outcomes of male adolescents and youths in Zimbabwe.*

HIV may differently affect males who contracted it in their youths versus those who contracted it during birth. In addition, HIV may have a different effect at different levels of education (e.g., primary, secondary, tertiary). Chapter 4 examines this causal relationship and highlights the stage at which HIV affects human capital accumulation, thereby highlighting areas that need interventions.

*Aim 4: To qualitatively analyze effects of HIV on intergenerational transmission (mother-to-child) of education in Zimbabwe*

Multi-country studies have shown that children with HIV-positive mothers have less school attendance. However, the mechanisms that influence this result have not been examined. Chapter 5 examines these mechanisms to fill the gap in studies that examine how parental HIV affects (gender gaps in) children's educational attainment.

## **Chapter 2**

This chapter provides a systematic literature review of global literature that examines effects of HIV on children's educations. The relevant literature was extracted from six databases, namely EconLit, ERIC, PubMed, SocINDEX, Web of Science (WoS), and Google Scholar. The Preferred Reporting Items for Systematic Reviews (PRISMA) method was adopted to conduct the inclusion and exclusion criteria. Papers were included in the review if they were peer-reviewed, published between 1990 and 2018, written in English, and analyzed the direct relationship between HIV and schooling outcomes. Articles were excluded if they were non-empirical, discussed the relationship between HIV and psychological or cognitive issues,

only focused on perceptions of HIV risk, if there was no HIV testing done on either parent or child, or if there was no confirmation of AIDS-related death of parent or guardian. The selected 62 papers were categorized into quantitative, mixed methods, and qualitative studies. The method of directed qualitative content analysis was applied for the analysis of the papers selected for the review. Specifically, we extracted information related to the key themes identified in the introduction (i) HIV-affected vs HIV-unaffected children; (ii) gender gaps in educational attainment; and (iii) intergenerational transmission of education. The quality of the papers selected for the review, was assessed using the Mixed Methods Appraisal Tool (MMAT). The results of the systematic review mainly showed the mechanisms that influence the relationship between HIV/AIDS and children's education. Differences were observed between HIV-infected and uninfected children, between HIV-affected boys and HIV-affected girls, and children with HIV-infected parents and other children's groups. The review also revealed that only a few studies examined gender gaps in educational attainment among children affected by HIV. Therefore, there is no conclusive evidence on whether HIV-infected girls, female AIDS-orphans, or girls with HIV-positive parents face more delays in schooling compared to their male counterparts.

### **Chapter 3**

This chapter analyzes the effects of HIV on inter- and intragender gaps in school attendance of children in Zimbabwe using a recent nationally representative dataset from the 2015 Zimbabwe Demographic and Health Surveys (ZDHS) and a multivariate Blinder-Oaxaca decomposition approach. The goal of this chapter is to generally examine whether there are gender gaps in school in Zimbabwe first and then establish whether there are differences in school attendance between HIV-positive boys and girls (intergender gaps). In addition, the study examines whether there are intragender gaps in school attendance between HIV-positive and HIV-negative girls (and boys as well). This is the first study to use a nationally representative sample that contains biomedical information on HIV infection of 11,673 children aged 6-18 years. This is the first study to perform this type of analysis in an HIV context in SSA. The results of this study showed that, in general, there are no gender gaps in school attendance between boys and girls in Zimbabwe. We also find no school attendance gaps between HIV-negative boys and HIV-positive boys. However, we find that HIV-positive girls attend less school compared to HIV-positive boys (intergender

gap). We also find that HIV-positive girls attend less school compared HIV-negative girls (intragender-gap). These results may be due to the fact that some HIV-positive adolescent girls in Zimbabwe have acquired the disease from husbands or romantic partners. Due to the age difference with older partners and power dynamics between men and women, some girls may be less able to negotiate for condom use. In addition to HIV infection, cultural responsibilities related to marriage and family life may lead adolescent girls to less school attendance among adolescent girls.

#### **Chapter 4**

Chapter 4 examines effects of HIV on educational attainment using socio-demographic and biomedical data on HIV infection from ZDHS (2015) for 4,130 male adolescents and youths aged 15-29 years in Zimbabwe. The chapter addresses endogeneity issues related to the HIV variable by exploiting circumcision as an instrumental variable and by relying on a probit two-stage least squares model and a Heckman selection model. There are only a few studies that have examined these effects of HIV on various outcomes educational attainment among males, and there are currently no such studies that have been conducted in Zimbabwe. The chapter examines these effects by exploiting the binary nature of the treatment variable (HIV) and an instrumental variable (IV) to obtain average treatment effect (ATE) under the hypothesis of selection on observable and unobservable characteristics. The IV we use are voluntary medical male circumcision (VMMC). To examine whether the ATE's are significant at the primary, secondary, and/or higher education level, we estimate a seemingly unrelated bivariate probit model with IVs. The results show that HIV has a negative and significant effect on total years of education. The results also reveal that HIV mainly has an effect at the higher education level (or tertiary level). This could be due to older youths may not have benefited from PMTCT and other HIV prevention efforts as their younger counterparts. It could also be that younger boys experience slow disease progression. Therefore, effects of the disease on education are experienced at a later stage when they are old enough to be in higher education.

#### **Chapter 5**

This chapter uses a qualitative design to investigate mechanisms that influence the effects of parental HIV on the education of children. The study was conducted in collaboration with the Mashambanzou Care

Trust in Harare, Zimbabwe – a facility that provides care to HIV-positive individuals. The data encompasses 16 purposively sampled low-income HIV-positive and HIV-negative mothers whose age was above 18 years. All HIV-positive mothers were on treatment and all women in the sample had at least one school-going child. We use a framework that describes the channels that influence the direct and indirect effects of the HIV status of a parent on investments in their children's education. We find that the main reported mechanisms that influence this relationship are financial barriers exacerbated by HIV, children taking care of sick parents or siblings (child carers), and gender differences in how parental illness affects children. In addition, we find that children of HIV-positive mothers do not always have birth certificates, which is a major barrier to school and exam registration in Zimbabwe. Not having birth certificates to register for school was a major barrier to public education and access to public funding for HIV-positive mothers. Birth registration can be a difficult issue for low-income parents due to the strict and rigid requirements needed to register. Specifically, for impoverished parents, it is costly to obtain a birth certificate and it can be difficult for single parents.

## **Chapter 6**

The final chapter of the dissertation provides a comprehensive summary of the entire dissertation and synthesizes the findings of all the studies. The chapter starts off by reorienting the problem statement and the motivation behind the dissertation. The chapter then provides a description of the data and methods used in the various chapters. A major contribution of this chapter is the description of the major findings from all the chapters that have been condensed and synthesized. The chapter also provides explanations for the findings and highlights areas of future research. Furthermore, the chapter also presents policy recommendations, limitations, and concluding remarks related to these studies and aggregated findings. The findings mainly show that in Zimbabwe, HIV appears to affect girls' educational attainment more than boys. The chapter also highlights that there is both a level-of-education effect and a cohort effect in how HIV affects educational attainment among males in Zimbabwe. The findings also show some discrepancies in the findings. For example, there is a discrepancy in what HIV-positive mothers say about gender gaps in children's education and what the results from surveys show. Another major finding from all the studies is that, to a large extent, HIV is a poverty problem in Zimbabwe. Finally, the chapter reveals that there are

policy and culturally induced barriers to the educational attainment of HIV-affected children.