



Income Status and Education as Predictors of HIV Transmission in South Africa

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The global Human Immunodeficiency Virus (HIV) epidemic targets various populations around the world, and South Africa is one of a number of countries where prevalence rates of the virus continue to increase despite the introduction of a viable treatment option. Previously investigated implications of HIV in South Africa are primarily related to its effects on the health-care sector of the country. However, complex socioeconomic processes are relevant to the discussion of HIV-related risk factors and consequences affecting individuals and households within South Africa. A large body of literature covers many socioeconomic perspectives on HIV, including the effect of socioeconomic status on HIV infection. While the roles of income status and education as risk factors for HIV infection have been explored extensively in a South African context, the connection between this and consequent adverse impacts on these factors as a result of HIV infection has not been clearly identified. This paper aims to address the gap in the literature regarding how specific socioeconomic factors act as risk factors for HIV contraction, but also how the same factors are affected as an associated outcome in those infected with HIV. Specifically, this paper argues that income status and education act as risk factors for HIV through their effects on individual behaviour, while also being adversely impacted due to the occurrence of infection. These impacts on income status and education contribute to South Africa's inability to stop perpetuating the cycle of HIV prevalence.

Introduction

Globally, Human Immunodeficiency Virus (HIV) rates have stabilized over the past 15 years. However, global and regional averages can be misleading, as they fail to capture the continued significance of this disease for populations in eastern and southern Africa that make up almost half of the population living with HIV worldwide (UNAIDS, 2006). Specifically, within this region, South Africa is experiencing the most severe HIV epidemic in the world, accounting for nearly one fifth of the global number of people living with HIV. The number of individuals living with HIV in South Africa has steadily increased since 1990, reaching a total of 7.1 million in 2016 (UNAIDS,

2006). The role of HIV in South Africa extends beyond its direct effects on the health-care sector. It is challenging to grasp the complex socioeconomic dynamics within the country that contribute to and are impacted by increasing rates of the disease; the entanglement of several socioeconomic processes frames the discussion of risk factors and determinants of health affecting individuals and households within South Africa as a result of HIV infection. A large body of literature covers many socioeconomic perspectives on HIV, including the effect of socioeconomic status on HIV infection (e.g., Bärnighausen, Hosegood, Timaeus, & Newell, 2007; Buvé, Bishikwabo-Nsarhaza, & Mutangadura, 2002; Johnson & Budlender, 2002).

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Specific socioeconomic factors studied include wealth distribution, type of employment, income levels, education, and other features that comprise an overall view of socioeconomic status on individual and household levels (Kalichman et al, 2006). While the roles of income status and education as risk factors for HIV infection have been explored extensively in a South African context, the connection between this and consequent adverse impacts on these factors as a result of HIV infection has not been clearly identified. Specifically, this paper argues that income status and education act as risk factors for HIV through their effects on individual behaviour, while also being adversely impacted due to the occurrence of infection. These impacts on income status and education contribute to South Africa's inability to stop perpetuating the cycle of HIV prevalence.

History and Overview of HIV/AIDS in South Africa

HIV is a virus spread through the exchange of bodily fluids that attacks the body's immune system, specifically through attacking CD4 white blood cells, or T cells. These cells are present in the body to boost the immune system as a way of resisting attacks from infectious pathogens (Centers for Disease Control and Prevention, 2017). HIV not only destroys the T cells, but also makes copies of itself within these cells (Centers for Disease Control and Prevention, 2017). As time passes, if the virus remains untreated, HIV can destroy enough T cells that the body can no longer effectively fight off infections and disease (Ariën, Vanham, & Arts, 2007). Opportunistic infections are then able to take advantage of a very weak immune system, eventually leading to the development of AIDS. AIDS is in itself not a virus, but is rather a set of symptoms caused by HIV when it is left untreated. An individual is diagnosed with AIDS when their immune system is too weak to fight off infection, and they develop certain defining symptoms and illnesses. While there is no cure for HIV, there is a treatment

available, which is known as antiretroviral therapy (ART) (Centers for Disease Control and Prevention, 2017). With successful antiretroviral therapy, the body is able to remain mainly healthy and continue to fight off most viruses and bacteria.

The HIV epidemic in South Africa was initiated by one or two isolated cases in the late 1980s, and has continued to increase since then (Simelela, Venter, Pillay, & Barron, 2015). In 1982, 250 random blood samples were taken from homosexual men living in Johannesburg, of which a startling 12.8% were infected with the virus (McNeil, 2012). It was not until the first AIDS related deaths began to occur in 1985 that the Apartheid government of President P.W. Botha held a conference in an attempt to address the potential threat this disease posed for the country. The outcome of this conference led the government to implement regulations in 1987 which added HIV/AIDS to the official list of communicable diseases relevant to South Africa. In particular, government regulations required a mandatory 14-day quarantine for individuals suffering from, or suspected of suffering from, HIV/AIDS. Furthermore, in 1988, the government responded by joining a new group called the AIDS Unit and National Advisory Group, which was responsible for responding to continuing growth of the HIV/AIDS pandemic in South Africa. Despite these early efforts, the measures and actions taken by the government before the Apartheid were limited overall, and by 1990 an estimated 74,000-120,000 South Africans were living with HIV (McNeil, 2012). In the 1980s, minimal attention was paid to the epidemic, which was largely confined to homosexual men, hemophiliacs, and foreign African mineworkers (Sehović, 2015). The government at the time perpetuated racial and socioeconomic inequalities institutionalized under the Apartheid. The stigma attached to the particular groups affected by the epidemic, who were marginalized through systemic inequality and racism as part of the Apartheid, contributed partly to the government's

reaction and lack of attention to or action toward these groups. This stigma and fear provided the basis for the initial response by the government in the 1990s, which focused on providing both condoms and safe-sex education.

The current South African government was put in place in 1994, following the dissolution of the racially oppressive Apartheid regime (Metzler, 2007). The new democratic government focused on addressing the racial fragmentation and inequalities of the Apartheid regime. This shift to a new administration inspired excitement for the future of the country and its new possibilities, including renewed attention towards the HIV epidemic. The African National Congress created a National Advisory Group (NACOSA) responsible for advocating and drafting a national HIV/AIDS Plan. The plan was accepted, and was supposed to be implemented in 1994. However, the Mandela government had other pressing concerns within the country, related to dealing with the significant impacts of racial and socioeconomic inequalities left as the legacy of the Apartheid regime. Despite the hope brought on by a new democratic government 2.9 million South Africans were living with HIV at the beginning of 1998, over 700 000 of them infected in 1997 alone (World Health Organization, 1998). Many of the promises made by the government, such as more widespread and easier access to ART, remained completely or partially unfulfilled in their implementation (Metzler, 2007). The National AIDS Plan outlined prevention interventions, but its implementation was inadequate to target the influx of new infections. Furthermore, the time period from 1998 until 2008 was arguably the biggest test for South Africa in terms of dealing with the HIV epidemic, as its health impacts became ever more prevalent during President Thabo Mbeki's period of "denialism" (Simelela et al., 2015). Mbeki denied a causal link between HIV and AIDS, which greatly affected the population's overall perception of his efforts to address the epidemic. The clash between civil society and Mbeki's

administration was heightened by the belief that the government was delaying a phased expansion of the Prevention of Mother-to-Child Transmission (PMTCT) program (Simelela et al., 2015). This program was a key component of the early response to HIV in South Africa, validating the pressure from civilian groups pushing the government to ensure its widespread availability.

From 2002 on, the implementation of a new strategic plan redirected the government's interest and efforts in addressing the issue of HIV. However, the initial "denialist" attitude towards the presence of the virus is still estimated to have resulted in the deaths of 330,000 people because lifesaving ART was not provided (Chigwedere, Seage, Gruskin, & Lee, 2008; Heywood, 2004). In the past five years, there has been considerable progression in terms of the country's response to high HIV rates. By 2015, South Africa had administered ART to close to three million people, treating a larger number of individuals than any other country in the world (Simelela et al., 2015). In spite of increasing governmental interventions in treatment and prevention of HIV, South Africa continues to see increasing rates of new infections (Shisana, Rehle, Simbayi, Zuma, & Jooste, 2009). This highlights the necessity of exploring a more holistic socioeconomic approach to understanding the complex processes that affect HIV within the context of South Africa. Notably, the political history of South Africa plays a significant role in the distinguishing characteristics of its HIV epidemic over the last 25 years, compared to the rest of world. The Apartheid instilled institutional elements of racial and socioeconomic inequality that were ingrained into initial approaches to addressing the disease, allowing HIV spread to become a much larger issue. The Apartheid was developed according to racist colonial views, in which the policies of industrialization led to segregation of and clashes between racially defined groups of people. This segregation was specifically developed to nurture early industries, such as mining, and capitalist culture. These inherent racial and socioeconomic

inequalities that developed as a result of the Apartheid serve to frame the contemporary landscape of HIV in South Africa.

Historical prevalence rates and government responses, in conjunction with the contemporary state of poverty in South Africa, frame the relevance of examining how income status and education act as socioeconomic determinants of HIV. Major changes in the political environment have contributed to the conditions that now exist within this country. The post-Apartheid government inherited one of the most unequal societies in the world. Decades of social and economic discrimination against black South Africans left a legacy of income inequality along racial lines. Therefore, understanding not only how income and education play a role as risk factors for HIV, but also how they are adversely impacted for individuals and households affected by the disease, will add to the discussion of how the cycle of poverty perpetuates HIV in South Africa. Furthermore, the dynamics of the intertwined relationship between income status and education are important to examine due to the nature of their effects on one another.

Intersection of Education and HIV Infection

Education levels do not necessarily have a deterministic relationship with risk of HIV infection independent of other factors. The discussion of education as a factor that contributes to sexual behaviours that act as risk factors for HIV transmission encompasses several different elements. Relevant facets of education include general levels of educational attainment as well as education specific to HIV infection. Firstly, the education system in South Africa is riddled with problems that trace back to the Apartheid. The Bantu Education Act of 1953 was implemented to ensure that whites received a better education than blacks (Giliomee, 2009). Black pupils received about a fifth of the education funding of their white peers (The Economist, 2017). Most independent church-run schools that provided a

good education in black areas were shut down. Of 200 black pupils starting school, just one could expect to do well enough to study engineering, while 10 white students could expect the same result (The Economist, 2017). In 1954, Hendrik Verwoerd, one of the key actors of the Apartheid system, said that blacks ought not to be trained above certain “forms of labour” (Giliomee, 2009). Abusing the education system to prevent certain groups from exceeding a certain level of education ensures that these individuals were not able to attain employment. Ultimately, education plays an important role in the spread of HIV. A longitudinal cohort study looking at educational attainment data from a poor rural community in KwaZulu-Natal, South Africa found that one additional year of schooling reduced the hazard of acquiring HIV by 7% (Bärnighausen et al., 2007). The results of this study suggest that increasing educational attainment in the general population may lower HIV incidence. Additionally, HIV prevalence fell more consistently among highly educated groups than within those that were less educated, among whom HIV prevalence sometimes rose while the overall population prevalence value was falling (Hargreaves et al., 2008). Merzel and D’Afflitti (2003) suggest that individuals with higher levels of education are more likely to engage with health promotion messages due to their increased ability to understand and act on such messaging. An improved ability to comprehend messages about prevention options makes more educated individuals more likely to adopt HIV risk-reducing behaviours more quickly than with those with less education (Bärnighausen et al., 2007). Furthermore, the link between higher levels of education and decreased risk of HIV infection is also associated with increased exposure to school-based HIV prevention programmes, including access to school-based health services (Coates, Richter, Caceres, 2009). Individuals that attend school have greater exposure to prevention programmes, which is likely to influence them toward adopting lower risk behaviours. More frequent access to health-care services is likely to

increase the number of checkups attained prior to any possibility of infection.

Young women represent a key demographic influenced by the factor of education as related to risk behaviours for HIV transmission. There is a profound peak in HIV incidence in young women aged 15 to 24 years in South Africa (Muula, 2008). Women, especially younger girls, are more likely to become infected with HIV during unprotected vaginal intercourse (Muula, 2008). Along with the biological vulnerability of women for HIV risk, there are also socioeconomic factors that “disempower women” (Wojcicki, 2005, p. 2). In South Africa, women have limited access to education, which is related to their dependence on their male counterparts for economic purposes. If husbands engage in non-monogamous sexual behaviours, it increases the likelihood of infection for their wives through an increased chance of coming in contact with the infection through their partner. Women who are dependent on their husbands or male counterparts due to lack of education will often exhibit risky behaviours, such as staying with their husband, in these situations (Wojcicki, 2005).

In its earlier stages, HIV does not have detrimental impacts on health that would impede participation in regular activities. Individuals with higher levels of education were found to have more sexual partners throughout their lives than those who were less educated (Bärnighausen et al., 2007). However, as the spread of infection continued in South Africa, individuals with higher levels of education likely adopted HIV risk-reducing behaviours in a more active manner than those without. The quick attainment of this behaviour can be explained by the fact that those with higher education had more exposure to health promotion messages, or were more empowered to negotiate protective behaviours with sexual partners.

HIV has an adverse impact on levels of educational attainment on both individual and

household levels within South Africa. Firstly, HIV prevalence in South African teachers reached 21% among those aged 25–34 and 13% among those aged 35–44 (Boutayeb, 2009). Consequently, it affects the educational capacity of African countries. High rates of infection can decrease the number of teachers available to work in public schools, which will effectively reduce the number of children who are able to attain an education. Since education is a factor in the likelihood of becoming infected with HIV, this inability to gain higher levels of education could then put those children at a higher risk of infection. Secondly, children’s education can be severely hindered if their caretakers are HIV positive (Johnson & Budlender, 2002). Children may often be kept out of school if they are needed at home to care for sick family members, or to work in the fields. Children may also drop out of school if their families cannot afford school fees due to reduced household income as a result of an HIV death. Booyesen and Summerton (2002) found that young women who had not completed high school in South Africa were more likely to be infected with HIV compared with those who had completed high school. In addition, women between 20 and 24 years of age were more likely to be infected compared with those aged 15 to 19 years (Avert, 2017). Women who attain higher levels of education are more likely to delay sexual debut and childbearing, have fewer children, earn better incomes, and have greater decision-making power within relationships (Muula, 2008). These advantages for women with higher education play a role in their ability to avoid engaging in risky behaviours for HIV contraction. Therefore, the education system faces a special challenge to educate students about HIV and AIDS, and to equip them to protect themselves. Disadvantageous impacts of HIV on educational attainment are harmful not only on an individual or household level, but also to the country as a whole. Specifically, the challenges that students face in effectively engaging in education as a direct or indirect effect of HIV causes stunting of their achievement of higher education levels. In

turn, lower levels of educational attainment are linked to a higher risk of HIV infection. This continues to perpetuate the cycle of HIV infection, which negatively impacts the overall development of South Africa.

If educational attainment on an individual level decreases or remains in a perpetual cycle of incompleteness, the ability of the country to prosper will be challenged. Education is essential for human development, and needs to be enhanced, especially in South Africa. A high prevalence of HIV is reversing the trend toward the achievement of universal primary education in most African countries, including South Africa. In South Africa, less than 65% of children are enrolled in primary school, and thousands of children have to leave school prematurely under the pressure of infectious diseases; this includes those who are orphaned as well as those who are disabled, impoverished, or those who withdraw to look after ill members of their families (Nyindo, 2005). The education service is the largest occupational group in the country, which includes 375,000 teachers, 5,000 inspectors and advisers, and 68,000 managers and support personnel; at least 12% of all educators are reported to be HIV positive (Coombe, 2000). The presence of teachers with HIV adversely impacts the overall education system in the country for several reasons. The work of teachers is compromised by periods of illness. Once they are aware that they are HIV positive, many are likely to lose interest in continuing professional development. Even among educators who are not infected themselves, morale is likely to fall significantly as they cope emotionally and financially with sickness and death among relatives, friends, and colleagues, and wrestle with uncertainty about their own future and that of their dependents (Coombe, 2000). To cover for sick colleagues, educators likely have to take on additional teaching and other work related duties. Even though discrimination is illegal, stigmatization of infected learners and educators is a deeply rooted response.

The reversal of achieving universal primary education in South Africa exemplifies the ways in which HIV impacts the development of the country, as education is a key indicator for progression. Education levels are significantly tied to the socioeconomic factor of income status. In South Africa, education levels correlate with employment levels, which indirectly relate to income status. Higher education is correlated with better employment outcomes and greater labor market participation (Banerjee et al., 2008). The largest increase in this participation is seen in the sector for those with “matric or less”, meaning less than a high school education (Banerjee et al., 2008). This group has also seen its employment rate actually decline. Even individuals with a post-matric (university level) education face high unemployment rates (Banerjee et al., 2008). Ultimately, a completed university degree is necessary to escape unemployment in South Africa.

Relationship Between Socioeconomic Status and HIV Infection

The relationship between income status and risk of HIV is complex, as it tends to also encompass various other factors, such as employment type. There are several arguments to support the idea that higher rates of infection may be expected among the poor; however, there are also several that demonstrate why the opposite could be the case. It is necessary to highlight the fact that differences between these two arguments often hinge on the gender and extent of urbanization of the risk group to which they are applied (Johnson & Budlender, 2002). Poor individuals are vulnerable to HIV infection because many risk factors for HIV, aside from income status, are also linked to overall low socioeconomic status. The poor are also more likely to be exposed to greater levels of danger in their daily life than are the relatively wealthy. The threat of imminent danger is exemplified through features like the threat of intimate partner violence against women (Dunkle et al., 2004). In South Africa, it is acceptable for

men to have multiple sexual partners. Consequently, women are placed in a position where the decision to leave their partners because of infidelity is often associated with a high risk of partner-related violence. These women are at a higher risk of behaviours associated with HIV infection if they are in a position of financial dependence on their male counterparts. If they are unable to support themselves financially through their own income, their likelihood of infection, particularly in threatening circumstances that they are unable to leave, is higher. To individuals from poorer communities, the threat of HIV may not necessarily seem as urgent compared to the stresses of everyday life. Ultimately, individuals that cannot prioritize avoiding the possibility of HIV transmission may become infected (Johnson & Budlender, 2002).

Individuals with lower socioeconomic backgrounds are also less likely to have access to proper treatment, due to issues with affordability or physical access to treatment. Of HIV admissions to Somerset and Groote Schuur Hospitals between 1988 and 1993, only 48% of heterosexual males had ever been employed (Fouri, 2006). Furthermore, among those that had been employed, 74% had been employed in unskilled or semi-skilled labour. These statistics suggest that there is a higher concentration of HIV infection in unemployed and unskilled or semi-skilled groups (Roos, 2013). The same study showed that HIV prevalence rates were significantly lower at higher employment skill levels (Roos, 2013). This supports the idea that, to the extent to which employment skill levels are likely to be correlated with income levels, lower HIV prevalence is expected at high income levels. Skill level, as it relates to employment, is determined closely by the level of education that is attained. Higher educational attainment, in turn, leads to a higher likelihood of employment.

While poorer individuals have a higher risk of contracting HIV, it is not necessarily clear that wealthier individuals are at a lower risk of

infection. In studies focusing on poor communities, it is not the members of the asset-poorest households who are at highest risk of HIV acquisition, but people who live in households belonging to the middle category of relative wealth (Hargreaves et al., 2008). It can be argued that men with a higher earning potential or increased income status are able to attract greater numbers of sexual partners, therefore placing them at a higher risk of infection. Arguably, the effect of income on HIV risk is different for men and women. Men may be more likely to use their higher socio-economic status to acquire sexual partners than women, suggesting that the prevalence rates for men may peak at higher income levels than for women. However, in South Africa many women have an income that is strongly dependent on that of their male partners, meaning that male and female income prevalence patterns are not independent. While income status has two different patterns in terms of its effect on HIV risk rates, both arguments still ultimately identify income status as a significant determinant of HIV risk.

HIV affects not only the infected individual, but also the income and livelihood of their household. Household impacts begin as soon as a member of the household starts to suffer from HIV-related illnesses. The effects of illnesses related to HIV infection on the body could prevent infected individuals from continuing to work, which could lead to loss of income. If the patient is male, they are often the higher or only earner of the household, resulting in a lack of income for the entire family (Greener, 2004). Furthermore, income status or overall economic status of a household is affected when household expenditures for medical care increase substantially due to treatment of the infection. If the main income earner for the family is affected, then other members of the household, usually daughters and wives, will also have to work less in order to care for the sick individual. This is similar to the effect of HIV infection on education, as a member of the household is

indirectly affected through the need for care. Therefore, any members of the household that are infected with HIV require other members to not only spend less time on their education, but also to take time away from work, and therefore reduce their earning potential (Bollinger & Stover, 1999). In cases where the individual infected with HIV dies during later stages of the infection, the temporary loss of income then becomes a permanent loss.

Further to the loss of income after the death of an HIV infected individual, there are additional costs that a household will be burdened with as a direct result of the death. For example, a study in the province of KwaZulu-Natal projected that there would be an increase of 419 burials a day by the year 2011 due to HIV/AIDS, from 224 per day to 643 per day (Bollinger & Stover, 1999). Not only does this increase the demand for cemetery plots, but household costs, including those for burial, transportation to and from the burial, and lost wages due to taking time away from work to attend funerals, will also increase. Removing children from school in order to save on educational expenses and increase household labour could result in a severe loss of future earning potential (Bollinger & Stover, 1999). The death of parents infected with HIV also plays a role in the loss of future earning potential, as many children then become orphans. Over 100,000 children became AIDS orphans in South Africa in 1998 alone, and by 2005 an estimated one million children under the age of 15 were orphaned (Kingham & Steinberg, 1999). These overall effects of HIV on income status or potential earning capacity, either in households or on an individual level, directly impact the ability of the country as a whole to develop. With increasing HIV rates, adverse effects on income status are likely to continue to hinder South Africa's capacity for growth in both the economic and social sectors.

Conclusion

In conclusion, HIV continues to be a growing concern in South Africa as the prevalence rate is among the highest globally, and continues to increase. The two socioeconomic factors of income status and education are not only associated as determinants for HIV risk within South Africa on an individual level, but also impact the ability of the country as a whole to progress. Education levels in South Africa play a role in how HIV interacts with other environmental influences. Individuals with higher levels of education are less likely to engage in behaviours that increase their susceptibility to HIV, and higher levels of education decrease the likelihood that individuals will be hindered in their ability to protect themselves from HIV transmission. The toll of HIV infection on the education sector perpetuates a cycle of stagnant development in South Africa as the role of educators is comprised, lower levels of education are achieved, and the overall education system suffers. Additionally, while there is evidence that income status plays a role in HIV risk, whether on the higher or lower end of the socio-economic spectrum, much like education, HIV also acts to adversely impact income status. The presence of HIV, and its detrimental impacts on these two socioeconomic factors specifically, frames a larger concern for how HIV is shaping the development of South Africa through education and income status. Further studies should examine the specific role of poverty within South Africa as it relates to the inability of the country to prevent new HIV infections from emerging.

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