The Influence of Socio-Economic Determinants on HIV Prevalence in South Africa

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Abstract: AIDS, caused by the human immunodeficiency virus (HIV), is one of the major hindrances to development in sub-Saharan Africa. 18% of the South African population is infected with HIV. In the literature, little attention has been given to the socio-economic context in which people live to explain observed prevalence levels. This study uses an economic model of risky sexual behaviour to investigate the correlation between different socio-economic attributes and HIV prevalence in South Africa. The empirical results show that HIV prevalence is positively correlated with level of education, marriage and the proportion of female headed households, and negatively correlated with average age, proportion of young people, the proportion of women and fertility rates. The estimated variables accounted for 88% of the relationship to the observed levels of HIV prevalence.

JEL Classifications: D13, I12, I15, I30
Keywords: HIV/AIDS, Determinants, Prevalence, South Africa

1. Introduction

The HIV and AIDS epidemic is one of the largest obstacles to development in South Africa and is destroying the lives and livelihoods of millions of South Africans. About 5.7 million people out of the population of 49 million are infected, with HIV and AIDS the most common cause of death. South Africa also suffers from persistent poverty with around 40% of the population living in poverty with the poorest 15% in a desperate struggle to survive. The AIDS epidemic is the most
discussed public health crisis of contemporary times. Economic theory can be used to examine the private and public responses to the epidemic. The economics of sexuality predicts that individuals choose between safe and risky sex as a rational decision, subject to their response to changes in incentives.

Much of the theoretical and empirical work on the AIDS epidemic within the field of economics has emphasized industrialized countries. Even though human beings are expected to behave similarly regardless of the society they live in, there is still a great difference between industrialized and developing countries. This is true because the demographic, social and economic context in which people live highly influence the individual risk of exposure to HIV infection. According to Casale and Whiteside [2], little recent research explores the influence of socio-economic variables on the risk of contracting HIV. Shaikh and Bhorat[23] also state that there is very little empirically robust information on the social and welfare correlates of the HIV and AIDS pandemic. Collins and Rau[5] write that efforts of HIV and AIDS prevention pay too little attention to the socio-economic context in which people live. Social and economic realities constrain individual actions and this is most likely the main reason for the gap between what people know and how they act.

There is an increasing need to study the socio-economic context of HIV infected people. There is evidence today of increasing HIV transmission in poorer, more rural parts of populations and a declining trend among the better-off[2, 13].

Thus, this paper aims to investigate the correlation between socio-economic factors and HIV prevalence in South Africa using provincial-level data. It will analyze the drivers of the epidemic to discover what socio-economic factors make people susceptible to HIV infection.

2. Effects of HIV and AIDS in South Africa

An estimated 310,000 South Africans in 2009 died of AIDS, more than in any other country[32]. Prevalence is 17.8% among those aged 15-49[13]. Almost one-in-three women aged 25-29, and over a quarter of men aged 30-34, are living with HIV[32]. The impact of the AIDS epidemic is reflected in the dramatic change in South Africa’s mortality rates. The overall number of annual deaths increased sharply from 1997, when 316,559 people died, to 2006 when 607,184 people died[32]. This rise is not necessarily due solely to HIV and AIDS but it is young adults, the age group most affected by AIDS, who are particularly shouldering the burden of the increasing mortality rate. In 2009, 41% of deaths were attributed to 25-49 year olds[24, 29, 30]. This is a strong indicator that AIDS is a major factor in the overall rising number of deaths.

South Africa’s HIV and AIDS epidemic has had a devastating effect on children. There were an estimated 330,000 under age of 15 living with HIV in 2008[14, 32]. HIV in South Africa is transmitted predominantly through heterosexual intercourse, with mother-to-child transmission being the other main infection route. The national transmission rate of HIV from mother to child is approximately 11%[13, 25]. Thus, many HIV-infected children are born into families where the virus have already a severe impact on health, income, productivity and the ability to care for each other. It is also not uncommon for parents to die from AIDS while their offspring are young. The number of premature deaths due to HIV and AIDS has risen significantly over the last decade[12, 26].

The loss of a parent not only has an immense emotional impact on children but for most families can spell financial hardship. One survey on HIV’s impact on households found that, 80% of the sample would lose more than half their per capita income with the death of the highest income earner, suggesting a lingering and debilitating shock of death[4].
It is estimated that there are 1.9 million AIDS orphans where one or both parents are deceased in South Africa\[^6,12\], and that the HIV and AIDS epidemic is responsible for half of the country’s orphans\[^8\]. Orphans may put pressure on older relatives who become their primary care providers; they may have to relocate from their familiar neighborhood; and siblings may be split apart, all of which can harm their development\[^3\].

3. An Economic Model of Risky Sexual Behaviour

Risky sexual trades are transactions that take place under uncertainty. The uncertainty concerns the reliability of the quality of the good or service. In the case of HIV and AIDS, the uncertainty refers to the health of one’s sexual partner, a problem of uncertain quality in consumption\[^8\]. In our study, we adopt the theoretical framework for risky sexual behavior in Philipson and Posner\[^22\]. Their model assumes the choices of safe sex and unsafe sex, where “safe sex” means sex with condoms, and “unsafe sex” denotes all other forms of sex. We denote the representative individuals considering a sexual trade with each other as \(m\), for male, and \(f\), for female. Naturally, risky sexual trades are also between individuals of the same sex.

If safe and unsafe sex yielded the same utility, then the only rational choice, given the low price of condoms, would be to engage in safe sex. However, despite the often small cost of a condom, many people still engage in unsafe sex where they consider the use of a condom may reduce sexual pleasure\[^21\]. If the costs of safe sex are considerably higher than unsafe sex, the latter may be preferred despite the risk of HIV infection. The decision to engage in unsafe sex is modelled as a problem of making a rational choice under uncertainty. The expected utility (\(EU\)) of risky sex for \(m\) and for \(f\) is equivalent to the benefits (\(B\)) minus the expected costs (\(C\)) of risky sex. The two utility functions are defined as\[^22\]:

\[
EU_m = B - C (P_{mf}(1-P_m) P_f) \quad (1)
\]

\[
EU_f = B - C (P_{m}(1-P_f) P_m) \quad (2)
\]

where \(EU\) = expected utility;
\(B\) = benefit of unsafe sex;
\(C\) = cost of becoming infected with HIV;
\(P_i\) = probability of transmission, \(i = m\) or \(f\);
\(P_i\) = probability that \(m\) or \(f\) is already infected; \(i = m\) or \(f\).

A mutually beneficial and risky sexual trade will take place if and only if both \(m\)’s and \(f\)’s expected utilities are positive, that is \((EU_m, EU_f) > 0\). However, some risky sexual trades still occur even when \(m\)’s or \(f\)’s expected utility is negative due to violence such as rape. There is also another possibility for either \(m\) or \(f\) to compensate the sexual partner with negative expected utility, to engage in unsafe sex. The equations assume risk neutrality for all individuals, but that assumption is inconsequential to the analysis.

The benefit (\(B\)) of unsafe sex equals the disutility of using a condom due to the assumption that safe sex is sex with condoms. The benefit is assumed to be the same for both \(m\) and \(f\), but they might have different utilities. They do not necessarily find sexual pleasure without a condom to be the same. Men and women do not necessarily experience the same disutility of using a condom during sexual intercourse.

\(C\) is the cost of becoming infected with the HIV virus. This includes both financial and non-financial costs. Both \(m\) and \(f\) are assumed to be non-altruistic to each other, meaning that the cost to one’s sexual partner if he or she becomes infected is not a cost to oneself. Altruism can both reduce and increase the cost of risky sex. An altruist is more likely to switch to safe sex to avoid infecting
his or her partner than an egoist. On the other hand, an altruist may be more willing to engage in unsafe sex if it improves his or her partner’s utility.

The economic model of risky sexual behaviour is presented in Figure 1. The entire box signifies all possible pairs of infection probabilities of \( m \) and \( f \). The curve marked M is the locus of probability pairs at which \( m \) is indifferent between safe and unsafe sex. The other curve, marked F, is the equivalent locus for \( f \). There is convexity and concavity of M and F.

The expected costs of engaging in risky sex depend on the costs (\( C \)) of becoming infected with HIV and the probability of becoming infected. Equations (1) and (2) correspond to that probability as a function of three other probabilities: (1) \( P_m \) which is the probability that \( m \) is already infected, (2) \( P_f \) which is the probability that \( f \) is already infected and (3) \( P_{mf} \) and \( P_{fm} \) which are the probabilities of transmission, that is if \( m \) is infected, sex with him will result in \( f \) becoming infected and vice versa. At the left hand corner of the box where \( P_m = 0 \), \( m \) is willing to engage in unsafe sex with \( f \) under the condition that \( B/C \times P_f \), the benefit-cost ratio (to \( m \) of unsafe sex under the assumption of \( P_m = 0 \)), is at least 1 – meaning that the benefits equal or exceed the costs. The benefit-cost ratio is more likely to be 1 or more the lower \( P_f \) is. At point \( A_0 \), \( P_f \) is positive but low enough to generate a benefit-cost ratio of 1 for \( m \) although \( P_m = 0 \). But if \( P_f \) were any higher, \( m \) would refuse to engage in risky sex with her. \( M \) becomes willing to engage in unsafe sex with her for increasingly dangerous \( f \)’s as the probability that he is already infected rises. He then has less to gain from safe sex; hence the shape of the curve for \( f \). \( F \)’s curve can be analyzed correspondingly.

![Figure 1. Joint demand for risky sex (Source: Philipson and Posner (1993))](image)

Due to the assumption that risky sex is a mutually beneficial exchange of services, it only takes place in the region in which both \( m \) and \( f \) gain a positive net expected utility from it. That preferred risky-sex region is illustrated in Figure 1 by the two shaded areas. In the lower-left section, the probability that either \( m \) or \( f \) is infected is small. The expected cost of risky sex is therefore small and outweighed by the benefit. In the upper-right, the probability that either of the individuals is infected is great. The expected cost of risky sex is also small because risky sex creates only a small increase in the risk of being infected.
4. Methods

Philipson and Posner’s model of risky behaviour was selected because it is easy to interpret the importance of individuals’ environment – here socio-economic factors – in determining their HIV status and therefore observed HIV prevalence rates. Regression analysis is used to investigate the association between HIV prevalence and important variables that denote different socio-economic factors associated with the risk of HIV infection. Ordinary Least Squares (OLS) specification was selected with the aim of testing the statistical significance of variables which influence HIV transmission and therefore HIV prevalence. A brief review of previous studies of the main socio economic variables which influence HIV prevalence was undertaken. The purpose of this is to formulate and populate a structural form of the model with variables which have been shown in different contexts to strongly influence HIV prevalence in different populations in South Africa.

4.1 Socio-economic Determinants of HIV and AIDS

4.1.1 Wealth and HIV Expenditure

Low levels of wealth have a negative effect on HIV/AIDS knowledge [13] and high wealth insulates individuals to HIV infection. Bärnighausen et al. [1] found that socio-economic status is an important underlying factor which determines sexual risk behaviour. Financial resources were measured using average monthly per capita expenditure. The variable was calculated by dividing monthly per capita expenditure by the number of household members. Empirically wealth is positively and negatively associated with HIV prevalence [6, 28]. Other evidence however shows no agreement regarding the relationship between wealth and HIV and AIDS. Seemingly, this may be explained by the sensitivity to the choice of proxy. Johnson and Budlender [15] argue that as a result of a lack of resources people engage in unprotected sexual intercourse. This occurs in the context of their circumstances, which include the lack of money to buy condoms or offering their bodies for financial gain in order to make ends meet [1, 15].

4.1.2 Mortality

Studies show that mortality rates in South Africa increased between 1996 and 2010 mainly a result of an increase in mortality related to HIV [1, 13, 18, 28]. The total annual number of deaths in South Africa in 1996 was 387,784 and in 2010 was estimated to be 556,585. There was a lopsided rise in deaths among people aged 25 to 49 years. It was reported that in 2009 an estimated 310,000 South Africans died of AIDS [32]. In theory, mortality can play an important role in influencing people’s sexual risk behaviour since attitudes towards the future is key to the theory of risky behaviour. The proxy used is for mortality is the proportion of households experiencing deaths during the last 12 months.

4.1.3 Age

Age is an important variable in evaluating socio-economic determinants of HIV prevalence because sexual partner change rates are age dependent. The age of a person correlates with their knowledge of HIV/AIDS [13]. People’s average age and the proportion of young adults (15-39 years) in the province are used to measure the influence of age.

4.1.4 Education

Education is identified to be a positive link with knowledge of HIV and its prevention [13]. Studies have found declines in HIV prevalence in higher educated and an increase in prevalence among less educated [10, 12, 13, 21]. The education variable in the empirical analysis is the proportion of individuals in each province that has ever attended school.

4.1.5 Gender and Gender Inequality

Evidences from South African studies show that some gender norms related to masculinity encourage men to have more sexual partners and older men to have sexual relations with much younger women [20, 21]. This contributes to higher HIV infection rates among young people.
especially those aged between 15 and 49 years compared to young men. Norms related to femininity prevent women from accessing HIV information and services. Only 46% of women in South Africa have accurate and comprehensive knowledge of HIV/AIDS. Violence against women such as physical, sexual and emotional increases their vulnerability to HIV. Forced sex contributes to HIV transmission due to the tears and lacerations resulting from the use of force. Harris et al. found that fear and experience of violence make women reluctant to ask their partners to use condoms or refuse unprotected sex. Fear of violence prevents women from accessing HIV prevention, treatment and care. The proportion of female headed households in each province was used as a proxy for gender inequality to explore the imbalances between genders and its association with HIV prevalence at the provincial-level. Previous studies show that gender and gender inequality are strong risk factors.

4.1.6 Rural-Urban residence

Studies in South Africa show that noteworthy differences exist in the knowledge level of HIV/AIDS among people living in rural areas compared to people living in urban areas. Empirically, living in rural and urban areas has been found to be both positive and negative to the risk of HIV infection. It has been found that HIV prevalence is significantly higher in urban compared to rural areas, while others found safer sexual behaviour in urban areas than in rural areas. Thus, urban-rural has been selected as a determinant of HIV infection.

4.1.7 Mobility

South Africa has experiencing high levels of political and economic migration since political freedom in 1994. This migration is both internal and with neighboring countries. Migration is increasing the extent of sexual networks and this assists the spread of HIV/AIDS epidemic. Johnson and Budlender found that HIV prevalence was high among people that travel frequently. Mobility enables them to meet a wider range of people which potentially enables an increase in unsafe sexual practices in the population. This proxy was measured using data on peoples’ mobility from the Living Conditions and Communication survey 2007/08.

4.1.8 Fertility

Fertility rates are used to test whether fertility is significantly linked to HIV prevalence at provincial-level. The total fertility rate refers to the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with current age-current fertility rates (2.9 for women aged between 15-49).

4.2 Equation Specified for Estimation

The variables identified are average monthly per capita expenditure, proportion of households experiencing deaths, average age, proportion of young people, ever attended school, proportion married, proportion women, proportion female headed households, proportion living in urban areas, mobility and fertility. Given these previous studies, the specification of the equation for estimation purposes is:

\[ HIV_{prevalence} = \beta_1 + \beta_2 \times HIV_{Expenditure} + \beta_3 \times Mortality + \beta_4 \times Average\,age + \beta_5 \times Proportion\,of\,young\,people + \beta_6 \times Education + \beta_7 \times Married + \beta_8 \times Women + \beta_9 \times Female\,headed\,household + \beta_{10} \times Urban\,residence + \beta_{11} \times Mobility + \beta_{12} \times Fertility + \epsilon. \]

5. Data

The data for this research was collected from various datasets. HIV prevalence data came from nine annual nationally representative population-based surveys in the period 2000 to 2008. Aggregation to provincial-level was undertaken.
Provincial-level HIV prevalence rates are from the South African National HIV Survey 2010, which contains epidemiological data for the period 2000 to 2008. Table 1 shows HIV prevalence at provincial level.

Table 1. HIV prevalence by province 2000-2008 (%)

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KwaZulu-Natal</td>
<td>10.2</td>
<td>10.9</td>
<td>11.7</td>
<td>12.7</td>
<td>13.8</td>
<td>16.5</td>
<td>16.2</td>
<td>16.7</td>
<td>15.8</td>
</tr>
<tr>
<td>Mpumalanga</td>
<td>12.5</td>
<td>13.8</td>
<td>14.1</td>
<td>15.1</td>
<td>15.0</td>
<td>15.2</td>
<td>15.2</td>
<td>15.3</td>
<td>15.4</td>
</tr>
<tr>
<td>Free State</td>
<td>13.2</td>
<td>13.9</td>
<td>14.9</td>
<td>14.0</td>
<td>14.2</td>
<td>12.6</td>
<td>12.5</td>
<td>12.5</td>
<td>12.6</td>
</tr>
<tr>
<td>North West</td>
<td>9.3</td>
<td>10.0</td>
<td>10.3</td>
<td>10.4</td>
<td>10.6</td>
<td>10.9</td>
<td>10.1</td>
<td>11.9</td>
<td>11.3</td>
</tr>
<tr>
<td>Gauteng</td>
<td>13.5</td>
<td>14.0</td>
<td>14.7</td>
<td>13.7</td>
<td>12.7</td>
<td>10.8</td>
<td>10.7</td>
<td>10.5</td>
<td>10.3</td>
</tr>
<tr>
<td>Eastern Cape</td>
<td>5.5</td>
<td>6.0</td>
<td>6.6</td>
<td>6.8</td>
<td>7.9</td>
<td>8.9</td>
<td>8.7</td>
<td>8.9</td>
<td>9.0</td>
</tr>
<tr>
<td>Limpopo</td>
<td>8.2</td>
<td>8.7</td>
<td>9.8</td>
<td>9.9</td>
<td>9.6</td>
<td>8.0</td>
<td>8.2</td>
<td>8.6</td>
<td>8.8</td>
</tr>
<tr>
<td>Northern Cape</td>
<td>7.8</td>
<td>8.1</td>
<td>8.4</td>
<td>8.5</td>
<td>8.2</td>
<td>5.4</td>
<td>5.6</td>
<td>5.7</td>
<td>5.9</td>
</tr>
<tr>
<td>Western Cape</td>
<td>9.7</td>
<td>10.2</td>
<td>10.7</td>
<td>8.2</td>
<td>5.3</td>
<td>3.9</td>
<td>2.9</td>
<td>3.5</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Source: Department of Health, Summary of Provincial HIV/AIDS Statistics for South Africa 2010

The data above show that KwaZulu-Natal, Mpumalanga and Free State have the highest HIV prevalence.

The data on the other socio economic variables comes from two sources: the South African Institute of Race Relations (SAIRR), Living Conditions and Communications: South Africa Survey 2007/8 and the Human Science Research Council (HSRC) South African National HIV Prevalence, Incidence, Behaviour and Communication Survey, 2008: A Turning Tide Among Teenagers? This SAIRR survey has nationwide coverage on a sample basis and covers both rural and urban areas. The survey was designed to provide data on multiple facets of the living conditions of South African households, as well as the quality of service delivery in a number of key service sectors.

6. Results

A table of descriptive statistics is presented in Table 2.

Table 2. Descriptive statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Obs.</th>
<th>Mean/Proportion</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV prevalence</td>
<td>81</td>
<td>14.61</td>
<td>8.07</td>
<td>7</td>
<td>31.1</td>
</tr>
<tr>
<td>Expenditure</td>
<td>81</td>
<td>148668</td>
<td>47944</td>
<td>60820</td>
<td>326885</td>
</tr>
<tr>
<td>Mortality</td>
<td>81</td>
<td>11.93</td>
<td>6.48</td>
<td>2.9</td>
<td>32.6</td>
</tr>
<tr>
<td>Average age</td>
<td>81</td>
<td>23.04</td>
<td>0.98</td>
<td>21.3</td>
<td>22.9</td>
</tr>
<tr>
<td>Proportion youth</td>
<td>81</td>
<td>35.19</td>
<td>4.99</td>
<td>26.9</td>
<td>42.6</td>
</tr>
<tr>
<td>Education</td>
<td>81</td>
<td>64.28</td>
<td>13.90</td>
<td>38.0</td>
<td>92.3</td>
</tr>
<tr>
<td>Married</td>
<td>81</td>
<td>45.13</td>
<td>7.13</td>
<td>29.7</td>
<td>56.2</td>
</tr>
<tr>
<td>Women</td>
<td>81</td>
<td>52.86</td>
<td>2.60</td>
<td>48.8</td>
<td>58.9</td>
</tr>
<tr>
<td>Female head</td>
<td>81</td>
<td>24.99</td>
<td>7.54</td>
<td>13.8</td>
<td>46.0</td>
</tr>
<tr>
<td>Urban residence</td>
<td>81</td>
<td>44.77</td>
<td>26.11</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Mobility</td>
<td>81</td>
<td>0.69</td>
<td>0.49</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Fertility</td>
<td>81</td>
<td>8.45</td>
<td>0.79</td>
<td>6.4</td>
<td>10.8</td>
</tr>
</tbody>
</table>

The regression model results are outlined in Table 3 on the next page. Overall, the results show that R-squared is 0.88. Hence, the model can explain 88% of the variation in HIV prevalence.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimated coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>83.088** [3.81]</td>
</tr>
<tr>
<td>HIV Expenditure</td>
<td>0.057* [3.99]</td>
</tr>
<tr>
<td>Mortality</td>
<td>-0.349 [-3.57]</td>
</tr>
<tr>
<td>Average age</td>
<td>-0.339 [-0.37]</td>
</tr>
<tr>
<td>Proportion of young people</td>
<td>-0.073 [-0.54]</td>
</tr>
<tr>
<td>Education</td>
<td>0.107** [4.02]</td>
</tr>
<tr>
<td>Married</td>
<td>0.301 [0.96]</td>
</tr>
<tr>
<td>Women</td>
<td>-0.971*** [-4.64]</td>
</tr>
<tr>
<td>Female headed household</td>
<td>0.402* [3.68]</td>
</tr>
<tr>
<td>Urban residence</td>
<td>0.004 [0.09]</td>
</tr>
<tr>
<td>Mobility</td>
<td>4.045 [3.66]</td>
</tr>
<tr>
<td>Fertility</td>
<td>-5.964*** [-5.60]</td>
</tr>
<tr>
<td>Observations</td>
<td>81</td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.8834</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.8254</td>
</tr>
</tbody>
</table>

Note: Robust t-statistics in brackets; *, ** and *** indicate significance at 10%, 5% and 1% level, respectively.

7. Discussions

HIV expenditure is not correlated with HIV prevalence at the provincial-level. According to the theory, the poor should be more susceptible to HIV transmission since being poor discourages investments in health capital. Poor people may not be able to consider the risk of HIV infection as they are more concerned about today than about tomorrow, and even less concerned about developing AIDS in years ahead. The rich however, should theoretically, and probably do practically, be concerned about the future to a greater extent. But in the economic theory of risky behaviour costs must exceed benefits for individuals to choose safe sexual practices. Risky behaviour is relatively less costly for the rich as they are able to afford treatment if they acquire HIV and AIDS, and perhaps this is one of the main reasons there should be a positive link between expenditure and HIV prevalence.

Average age is negatively correlated to HIV prevalence. This result might be an outcome of the fact that fertility is strongly significant and that fertility and age are naturally correlated to each other. The other age variable is insignificant.

Education is also positively correlated to the dependent variable. Apparently, there is a gap between what people know and how they act. Earlier empirical studies have found a positive relationship between higher education and the number of sexual partners, but studies have also
found a stronger association with condom use among the well educated. The educated can more easily take in new information and disregard misconceptions about HIV and AIDS, but this may not automatically represent less risky sexual behaviour. They might still perceive the risk of acquiring HIV as small. Lundborg and Lindgren[17] found that education in alcohol consumption lead individuals to have lower risk beliefs. Thus, it might be a factor explaining why education is positively correlated to HIV prevalence. However, there is still a gap between what people know and how they act.

In relation to the premise on marital status, the findings in this research show that the number of people who have both non-regular multiple partners and do not use condoms during sex increases are at high risk of getting infected with HIV. In the other words, casual sex amplifies vulnerable to HIV infection in South Africa. Several studies show that casual sex and multiple and concurrent sexual partnerships in South Africa are the many sexual risk-taking behaviour are fanning the embers of the HIV epidemic.[8,13,20]

The variable proportion of women is strongly negatively related to HIV prevalence, indicating that provinces with a high proportion of men are at greater risk of a high HIV prevalence. This finding is despite the fact that women in South Africa are three times more likely to be infected with the virus. As more females are infected, men should have a greater probability of contracting the virus, but this might be offset by the fact that men are less vulnerable to the virus. The finding may therefore indicate that men engage in risky sexual behaviour more often than women.

The variable female headed household is positively correlated to HIV prevalence. This means that provinces with a higher proportion of female headed households have higher prevalence than provinces in which males are heads of households to a larger extent. There is a strong negative relationship between fertility and HIV prevalence.

Urban residence shows no significance, despite the fact that HIV prevalence is much more widespread in urban areas in South Africa. The significance of urban residence might be offset by other variables in the regression such as expenditure or education.

Mobility is not significant despite the higher HIV prevalence around major transport routes. Portability of people enables meetings between individuals, which can enable HIV transmission.

8. Conclusions

Our results have shown the strong influence of our selected socio-economic factors on HIV prevalence in South Africa. The settings and the circumstances that people live in affect how they behave and make decisions. Socio-economic dynamics have an effect on the opportunity for, timing and patterns of individual behaviour.

The evidence suggests that South Africa has all the socio-economic ingredients for a volatile HIV epidemic. However, socio-economic determinants are not uniform in all nine provinces and HIV prevalence is similarly not uniform. Thus, adult HIV prevalence in some provinces is as high as KwaZulu-Natal (39%), Mpumalanga (34%), Free State (30%) and the North-West (30%) [32]. The Northern Cape and Western Cape recorded the lowest prevalence at 17% and 16% respectively [32]. The findings show that different socio-economic factors in the nine provinces contribute to the spread of HIV.

The findings of this research suggest that the spread of the HIV in South Africa is significantly influenced by several socio-economic factors such as gender inequalities, fertility and others. The findings are not exhaustive as the analysis is made at the provincial-level. It would be optimal to use individual data, but this is not available. If future studies are able to collect individual data through surveillance, empirical findings may more closely reveal what makes people susceptible to HIV infection.
References:


