Abstract

Acquired Immune Deficiency Syndrome (AIDS) has ravaged sub-Saharan Africa in the decades since its first recorded case. The disease has reached epidemic levels in many regions, with millions of new cases diagnosed each year. This paper examines the effects of several variables on the infection rates of AIDS in six African countries across six years and tests the hypothesis that widespread misconceptions surrounding AIDS, e.g. the misconceptions that AIDS can be cured by intercourse with a virgin and that AIDS can only be transmitted among homosexuals, affects AIDS rates more than other variables. The study uses small-n methods and the congruence method of analysis on the state level. Ultimately, the study found that while the prevalence of misconceptions about AIDS in various countries does have a noticeable effect on AIDS rates, there are too many confounding variables and not enough data to say with certainty whether or not the hypothesis finds enough support to be plausible. The conclusion calls for more diligence in data collection on the independent, dependent, and confounding variables across the continent so that the results of future studies on the topic can be more conclusive.

Introduction

Ever since the simian immunodeficiency virus’ first cross-species infection of a human sometime in the late 50’s, AIDS has been responsible for millions of deaths throughout many sub-Saharan African (SSA) countries (Whiteside et al. 2003). But while the virus has reached a far larger percentage
of people in SSA countries than in any other region in the world, there are large discrepancies between the amounts of people diagnosed with the disease across different countries (Whiteside et al. 2003). What causes some of these SSA nations to suffer from AIDS epidemics but not others? This research question is important to address for several reasons. First and foremost, the citizens and policymakers of the countries examined in this study would benefit greatly from answering this question because if the root causes of AIDS epidemics could be determined, both groups would benefit from being able to address said societal/cultural causes and lower the rate of AIDS in their countries. Furthermore, scholars might be interested in the answer to this research question because finding an answer to it would increase the amount of knowledge regarding how societal and cultural factors affect the magnitude of AIDS epidemics in sub-Saharan Africa. This knowledge could then possibly be used to determine the causes of AIDS epidemics in other parts of the world.

This study will contribute to the scholarly literature on the causes of AIDS epidemics by empirically testing a new hypothesis about the root causes of AIDS epidemics. This new hypothesis is as follows: higher levels of misinformation about how AIDS is transmitted and treated leads to higher levels of AIDS in a given country. The cases used in this study, South Africa, Kenya, the Central African Republic, Uganda, Botswana, and Lesotho, were selected using a non-controlled case selection strategy and data taken from observations of each of these cases is analyzed using small-n methodology. Lastly, all findings and conclusions drawn from this study will be based on the congruence method of analysis.

**Literature Review**

There are three main schools of thought that have been used as frameworks to answer the research question: economic factors, social factors, and cultural factors. While all of these frameworks provide some explanation as to why some countries experience greater AIDS rates than others, the cultural factors school of thought gives the strongest support for its claims. Prior research has focused only on qualitative observations regarding the extent to which cultural factors have influenced the spread of AIDS in sub-Saharan Africa and has not focused on an empirical analysis of data to demonstrate quantitatively that cultural factors are most influential. This is an unfortunate oversight, as quantitative analyses are easier to draw generalizable conclusions from than qualitative analyses due to the relatively large amount of data points analyzed. This study will contribute to the literature on the causes of AIDS epidemics in sub-Saharan Africa by empirically testing if cultural factors have a strong influence on AIDS rates in a given country.
One school of thought that offers insight into this issue examines social factors. Research in this field focuses on the effects that various social issues present in countries suffering from AIDS epidemics have on their abilities to stop the spread of the disease. A study by Kevin De Cock et al. (2002) examined the role that framing AIDS epidemics as a human rights issue rather than a medical one plays in stopping AIDS epidemics and found that framing AIDS epidemics as human rights crises greatly reduces a country’s ability to stop the epidemics (De Cock et al. 2002). However, the researchers make many unaddressed assumptions about what constituted a ‘successful’ and ‘unsuccessful’ campaign and did not provide data on enough instances of countries experiencing AIDS epidemics to make generalizable conclusions.

Another study conducted under the social factors framework looked at the extent to which epidemics of injection drug use cause AIDS epidemics in various countries throughout sub-Saharan Africa (Dewing et al. 2006). The researchers of this study concluded that while the spread of injection drug use throughout sub-Saharan Africa has hastened the spread of AIDS in many countries, it is far from the most influential factor in determining how well countries can combat AIDS epidemics (Dewin et al. 2006). Another study by J. Moodley et al. that looked at whether providing AIDS treatment specifically to pregnant women would affect AIDS rates in a given country showed that providing more treatment options to pregnant women as opposed to other groups did lower AIDS rates in some countries, but not by a statistically significant amount (Moodley et al. 2011). Another important study that uses this framework, conducted by Adrian Smith et al. (2009), examined to what extent the legality of homosexual sexual intercourse in various SSA nations affected how quickly AIDS spread found that while making homosexual sexual intercourse legal did increase the rate at which AIDS spread, it did not make a significant difference (Smith et al. 2009). This is the primary difficulty that arises when using the social factors school of thought to analyze potential answers to the research question of this paper: social factors do not seem to have a significant effect on the severity of AIDS epidemics.

Another school of thought that is used to explain the existence of an AIDS epidemic examines economic factors in affected countries. Researchers in this field generally examine the links between the economic strength of a country and how this strength affects whether or not AIDS epidemics occur. Floyd Sian et al. (2012) studied the link between the ability of a country to purchase antiretroviral drugs and the existence of AIDS epidemics. The researchers found a negative correlation between ability to purchase antiretroviral drugs and the existence of AIDS epidemics in the vast majority of
countries they studied (Floyd et al. 2012). While the research methods used in this study were sound, the researchers’ seemingly definitive conclusion that economic variables have the greatest effect on whether a country suffers from an AIDS epidemic greatly downplays the significance of social and cultural factors while exaggerating the effects of economic factors as the researchers did not control for cultural or social factors, among other variables. The researchers found that only a small percentage of people were being helped or saved by antiretroviral drugs after an AIDS epidemic broke out, yet still recommended that countries should put disproportionately more money into purchasing the drugs without addressing the role that societal or cultural factors play.

Finally, a study by Jane Freedman and Nana Poku (2005) examined the existence of widespread poverty with respect to a country’s ability to stop AIDS epidemics. The study compared the percentages of people in low-income neighborhoods that were infected with AIDS with the percentages of those infected in high-income neighborhoods (Freedman and Poku 2005). While the study did show a slight positive correlation between poverty and likelihood of contracting AIDS, the researchers in this study again both significantly downplay the effects of cultural and social factors and exaggerate how much a country would be assisted by ending poverty by making a strong, unqualified claim regarding the significance of poverty with regards to AIDS epidemics in their conclusion that does not address how their results may be affected by other factors. The trend in these two studies therefore appears to be that researchers who frame their arguments in this school of thought exaggerate the effects of economics by generally not controlling enough for other variables.

Perhaps the most appropriate school of thought that can be used to analyze the research question examined in this paper is the cultural factors school of thought. Researchers who use this school of thought to frame their research study a country’s cultural norms and the extent to which these norms affect the course of an AIDS outbreak. For example, Nkolika Aniekwu and Ayo Astenuwa (2007) conducted a study that examined the causes behind why girls and young women were disproportionately vulnerable to AIDS infection compared to men. The researchers found that the most significant factor was the perpetuation of a misconception present in many of the countries they studied which held that having sex with a virgin would cure one of AIDS, but were ultimately unable to determine precisely to what extent the perpetuation of said misconception affected women with regards to other factors (Aniekwu and Astenuwa 2007).

Another study conducted by Edward Mills et al. (2012) examined the extent to which male involvement in preventing AIDS in a given country affected
how well said country dealt with AIDS epidemics. The researchers concluded that male involvement in preventing AIDS by either actively seeking education on how to avoid receiving/transmitting AIDS or being given such an education by the government or other humanitarian organizations did have an effect on how rapidly AIDS was spread in the nations studied, but again, the researchers never clearly lay out to what extent this factor affects the spread of AIDS (Mills et al. 2012).

The third study examined in this literature review using this framework was conducted by Chijioke Uwah. The study examined the link between the perception of AIDS in South Africa and how rapidly the disease was spread (Uwah 2011). The researcher found that the culture of denying that HIV lead to AIDS was one of the primary reasons that South Africa was hit so hard by the AIDS epidemic despite being one of the more politically and economically stable countries in sub-Saharan Africa. The methods in this study and the conclusion drawn by the researcher are both sound, but yet again, the author does not give a definitive answer to the question of to what extent this phenomenon affected the spread of the disease throughout South Africa. The fact that so many researchers using this school of thought were able to determine with some degree of certainty that the variables they were studying probably do have some effect on whether or not a country will suffer from an epidemic of AIDS makes it the most promising choice for examination with regards to the hypothesis.

Theory

This study argues that higher levels of misinformation about how AIDS is spread and/or treated leads to a higher level of AIDS in a given country. The theory put forth for this hypothesis is similar to that of Chijioke Uwah, who posited that the more people in a given country who do not believe that AIDS is caused by HIV, the higher the overall AIDS rate would be in the country (Uwah 2011). The theory in this paper varies slightly from Uwah’s in that it examines a different set of false beliefs about AIDS, but for the most part, the theories are closely related.

More precisely, the theory that will be tested in this paper is that when more individuals believe misconceptions surrounding AIDS, such as that only homosexuals can contract the disease or that having sex with a virgin cures AIDS, the percentage of infected individuals in a given country will eventually increase. For those that believe that AIDS can be cured by having sex with a virgin, this means purposefully seeking out only virgins as partners, who
typically are not infected with AIDS unless it was passed down to them by infected parents. For those that believe only those engaged in homosexual activity can contract AIDS, there would be no need to ask their partners about whether or not they are infected with AIDS due to the fact that they believe they are immune regardless.

Believing that having sex with a virgin can cure AIDS would lead to virgins being at a higher risk of contracting AIDS due to the fact that people who hold such beliefs would actively seek them out. Because virgins are not likely to already be infected with AIDS, when they do become sexually active, it is likely that they would quickly become infected due to the fact that they are being sought out by infected individuals. As more non-infected virgins become infected as a result of being sought out by infected individuals, the AIDS rate in a given country would rise.

Individuals who hold the belief that only those engaged in homosexual activity can contract AIDS, on the other hand, would be less likely to engage in safe sex practices and would be less likely to ask their partners if they are infected with AIDS due to the fact that they believe they are immune. Over time, non-infected individuals would contract AIDS from partners that are infected due to not taking the necessary precautions regarding AIDS prevention (i.e. asking one’s partner if he or she has AIDS). As more individuals are infected due to ignoring safe sex practices, AIDS rates would rise. Over time, this increase, along with the increase due to more virgins being infected, would increase the AIDS rate in a given country to potentially epidemic proportions.

**Research Design**

**Variables and Data Sources**

The independent variable that will be examined is the extent to which misinformation about AIDS has been spread throughout a given sub-Saharan African (SSA) country; the dependent variable is the extent to which AIDS has spread in a given SSA country; the confounding variables that will be examined are the extent of poverty in a given SSA country, the extent to which citizens of a given SSA nation have access to healthcare services, and whether a given SSA country was involved in a civil or interstate conflict at the time that an AIDS epidemic broke out.

The independent variable is conceptually defined as the extent to which misinformation about AIDS has been spread throughout a population in a given country. The independent variable is operationally defined as whether one or
both of two misconceptions, the misconception that only homosexual men can contract AIDS and the misconception that having sex with a virgin will cure one of AIDS, have become accepted as fact among at least 25% of the population of a given SSA country according to the results of two studies that were conducted by PEPFAR (PEPFAR 2011). Therefore, the independent variable will be an ordinal measure, with the categories defined from lowest to highest as follows: less than 25% of citizens of given SSA country hold both misconceptions as fact, and over 25% of citizens of given SSA country hold both misconceptions as fact. For the hypothesis to be correct there must be a positive correlation between this variable and the DV.

The dependent variable is conceptually defined as whether or not a given SSA country is suffering from an AIDS epidemic in a given time period. It is operationally defined as whether or not greater than 5% of a country’s population has been infected with AIDS according to the results of surveys found in the CIA World Factbook (CIA 2013) (Note: 5% is the mean number of citizens in SSA countries that have been infected with AIDS. It should be noted that there is no internationally accepted standard infection rate used as a benchmark for when a country experiences an epidemic; the only standard given by organizations such as the CDC thus far is that an epidemic occurs when the rate of infection for a given disease goes above normally recorded levels. Because AIDS rates have steadily increased across the board since the disease was first discovered, there has arguably never been a time where sub-Saharan Africa was not experiencing an epidemic of AIDS. Therefore, the method used to obtain the 5% was selected to facilitate empirical analysis, the results of which would be very unclear without a means of ordinal measurement). Therefore, the dependent variable will be an ordinal measure, with the categories defined from lowest to highest as follows: given SSA country does not suffer from AIDS epidemic, and given SSA country does suffer from AIDS epidemic. Data on this variable will be collected from the CIA World Factbook because it contains the most complete datasets on this variable for the time frame selected in this study.

The first confounding variable is conceptually defined as whether or not there exists a high level of poverty in a given SSA nation. It is operationally defined as whether half of the citizens of a given SSA country live on less than two dollars per day according to surveys conducted by the World Bank (World Bank 2013) (Note: The two dollar per day threshold was chosen as it is commonly cited by the World Bank as the international poverty line). This variable will be an ordinal measure, with the categories defined from lowest to highest as follows: given SSA country has a low (below 50% of citizens living
on less than two dollars per day) level of poverty, and given SSA country has a high (above 50% of citizens living on less than two dollars per day) level of poverty. Data on this variable will be collected from surveys conducted by the World Bank because it is one of the most reliable sources of statistical information on this variable. There is likely to be a positive correlation between levels of poverty and AIDS rates in a given country as higher levels of wealth presumably lead to better funded healthcare programs that could be used to diagnose and treat HIV positive individuals before they develop AIDS.

The second confounding variable is conceptually defined as the extent to which citizens of a given SSA country have access to healthcare services. It is operationally defined as whether a given SSA country spends more or less than $182 per capita on healthcare. This value is the average amount of money per capita spent on healthcare between the 15 countries that are currently suffering from AIDS epidemics (Note: This value was chosen for the same reason the benchmark for AIDS epidemics was chosen: there is no internationally accepted standard, and creating an arbitrary standard is useful in clarifying the results of empirical analysis). This variable will be an ordinal measure according to the following categories, given from lowest to highest: given SSA country has a low (below $182 per capita) level of spending on healthcare services, and given SSA country has a high (above $182 per capita) level of spending on healthcare services. This variable is measured according to data on per capita spending on healthcare services compiled by the World Bank (World Bank 2013). This source was chosen because it is one of the most reliable sources of data on this variable. There is likely to be a negative correlation between the amount of money spent per capita on healthcare services and AIDS rates in a given country as poorly-funded healthcare systems are presumably less capable of diagnosing and treating HIV positive individuals to prevent them from developing AIDS.

The third and final confounding variable is conceptually defined as whether or not a given SSA country is involved in a civil or interstate war in a given time period. It is operationally defined as whether or not a given SSA country is involved in a civil or interstate war in a given time period, with war defined as, “sustained combat, involving organized armed forces, resulting in a minimum of 1,000 battle-related deaths over a 12 month period” (Correlates of War 2013). This variable will be measured according to the results of studies conducted by the Correlates of War organization in various countries to determine whether or not said countries were involved in a civil (Correlates of War 2013) or interstate (Correlates of War 2013) conflict during a given time period. The variable will be an ordinal measure according to the following categories, given from lowest to highest: given SSA country did not experience intrastate or civil war in a given
time period, and given SSA country experienced intrastate or civil war in a given time period. The Correlates of War organization was chosen because it is one of the most reliable sources of data on this variable. There is likely to be a positive correlation between the existence of an interstate or civil war and AIDS rates in a given country. This is because the destabilizing effects of war would presumably lower the effectiveness of healthcare systems, making healthcare providers less capable of identifying and treating HIV positive individuals, and because phenomena specific to war, such as an increase in incidents of war time sexual assault by perpetrators who are already infected with AIDS, would cause the incidence of AIDS to increase.

Cases, Observations, and Methods

The cases chosen for this study are South Africa, Kenya, the Central African Republic, Uganda, Botswana, and Lesotho between 2005 and 2010, which will result in a total of 36 observations. These countries were selected for several reasons. First and foremost, these choices were heavily constrained by the data that was available on the 15 countries in the world that are currently suffering from AIDS epidemics. Data on all five of the variables that will be examined in this paper was only available on these six countries. Furthermore, it was difficult to find data on all five of these variables for any time period before 2005 and after 2010 as several organizations, such as the World Bank and PEPFAR, do not have the required data on file for unknown reasons. These cases were also chosen due to the fact that they vary greatly in many factors that will be analyzed in this paper such as per capita spending on healthcare, the prevalence of misconceptions about AIDS, and the existence of interstate and civil wars. Lastly, the choice to use a state-level analysis for this study was made because little data exists for any of the variables examined in this study at the local, district, or regional levels.

Furthermore, the chosen time frame contains a decent amount of variation among all of the variables as some of the countries that will be examined in this study were involved in a war in only some of these years, though not others, and some have greatly increased the amount of money they spend per capita on healthcare services over this period of time. The only limitation to this time frame comes from the nature of the disease itself. As AIDS develops as a result of HIV going untreated and incubating within the host for ten years on average, it is difficult to determine temporal priority of the IV over the DV with only a six-year time frame. Still, absent the determination of temporal priority, a strong correlation between the two variables can easily
be demonstrated.

Due to the fact that the observations of each of these cases will be conducted over a relatively short time period, small-n methods will be used to analyze observations, and all conclusions will be based on the congruence method of analysis.

Data Analysis

There is expected to be a positive correlation between the percentage of citizens who believe in one or both of the misconceptions about AIDS and the number of citizens infected with AIDS in a given country, which means that the level of misinformation about AIDS must be ‘high’ and the existence of an AIDS epidemic must be ‘yes’ for the hypothesis to find support. It should be noted, however, that even if values for each of these variables do not change enough to switch from one category to another (i.e. if AIDS rates increase from 1% to 4.9% and thus stay in the ‘no’ category), it is still possible for the hypothesis to find support if there exists a strong correlation between the two variables in the expected direction.

Case: South Africa, 2005-2010

The percentage of citizens in South Africa infected with AIDS grew rapidly between 2005 and 2010, rising from 10.8% in 2005 to 18.3% in 2010 (CIA 2013). The percentage of individuals who believed one or both of the misconceptions examined in this study also grew steadily, going from 14.2% in 2005 to 26.5% in 2010 (PEPFAR 2011). Large changes in the percentage of citizens who believe one or both misconceptions were not accompanied by equally large changes in the percentage of citizens who were infected with AIDS. For example, the percentage of citizens who believed one or both misconceptions increased from 14.2% to 16.2% between 2005 and 2006 (PEPFAR 2011), while the percentage of individuals who were diagnosed with AIDS only increased from 10.8% to 11.4% in the same time period (CIA 2013), meaning that a 2% increase in number of people believing either or both of the misconceptions was correlated with a .6% increase in number of individuals infected with AIDS. This would normally show a correlation between the two variables, but between 2009 and 2010, the percentage of individuals who believe one or both misconceptions only went up .3%, while the percentage of individuals infected with AIDS increased by 1.5% (PEPFAR 2011).

This shows that the correlation between the number of people who believe misconceptions about AIDS and the number of individuals infected with AIDS is
inconsistent or weak in the case of South Africa. An analysis of the data on the first confounding variable shows that poverty levels had little effect on AIDS rates in South Africa. From 2005 to 2007, the poverty level grew steadily from 33.2% to 35.8%, which is consistent with the expected correlation with the DV as AIDS rates also grew steadily in the same period of time (World Bank 2013). From 2008 to 2010, however, poverty rates began to steadily decrease to 32.5% (World Bank 2013) while AIDS rates continued to rise (CIA 2013), indicating that the correlation between this variable and AIDS rates is inconsistent.

An analysis of the data on the second confounding variable shows that even though South Africa consistently spent a ‘high’ amount of money on health care per capita they still experienced epidemic levels of AIDS for all six years (CIA 2013). Furthermore, higher amounts of money spent on healthcare per capita did not have the correlation with AIDS rates that was expected, as South Africa consistently spent more money on healthcare each year (per capita healthcare expenditures steadily grew from $453.00 in 2005 to $649.00 in 2010 (World Bank 2013)) yet still also experienced higher AIDS rates each year (percentage of people infected grew from 10.8% to 18.3% between 2005 and 2010 (CIA 2013)).

The existence of interstate or civil war also seems not to have much of an effect on AIDS rates. South Africa was involved in a civil war in Somalia between 2006 and 2009 and was not involved in any conflicts in 2005 and 2010 (Correlates of War 2013), but AIDS rates still grew steadily throughout the entire period of the study (CIA 2013). Therefore, the rate of AIDS in South Africa did not change its rate of growth even when the country got involved in and later pulled out of a conflict.

**Case: Kenya, 2005-2010**

The percentage of citizens in Kenya infected with AIDS grew steadily from 2005 to 2008, increasing from 6.3% to 7%, and then dipped slightly to 6.5% in 2009 before finally decreasing again to 6.3% in 2010 (CIA 2013). The percentage of individuals who believed one or both misconceptions about AIDS grew steadily from 4.5% to 6.3% between 2005 and 2009 and dropped slightly to 5.9% in 2010, indicating that the percentage of individuals who held the misconceptions dropped the year after AIDS rates in the country dropped (PEPFAR 2011). It is therefore possible that variations in AIDS rates could explain variations in the percentage of individuals believing in the misconceptions. This is the opposite of the expected correlation between these two variables.
An analysis of the data on the first confounding variable shows that poverty rates steadily decreased from 67.2% in 2005 to 65.5% in 2009 before increasing slightly to 65.7% in 2010 (World Bank 2013). Therefore, as was also the case with South Africa, the correlation between these two variables that exists is opposite of what was expected as AIDS rates grew steadily during the entire period that poverty levels were dropping and AIDS rates decreased during the period that poverty levels rose.

An analysis of the data on the second confounding variable shows that per capita expenditures on healthcare rose steadily from $22.00 to $37.00 between 2005 and 2010 (World Bank 2013). This indicates that healthcare expenditures grew steadily along with AIDS rates for all years except for 2009 and 2010, when AIDS rates dipped slightly, which is the opposite of the correlation that was expected. This data is also significant because even though per capita expenditures on healthcare in Kenya were considerably lower than in South Africa, AIDS rates in Kenya were considerably lower than in South Africa, indicating that per capita expenditures on healthcare probably had little to do with total AIDS rates in either country.

The existence of interstate or civil war seemed to have no effect on AIDS rates in Kenya as even though Kenya was involved in conflict between 2005 and 2009 (Correlates of War 2013) and AIDS rates rose consistently from 2005 to 2008 (CIA 2013), the drop in AIDS rates began sometime between 2008 and 2009 (CIA 2013). This indicates that the end of Kenya’s involvement in the conflict in Somalia did not have temporal priority over the decline in AIDS rates, which shows that it cannot be the cause for the decline in AIDS rates.

Case: Central African Republic, 2005-2010

The percentage of citizens in the Central African Republic infected with AIDS steadily declined from 7% to 4.7% between 2005 and 2009 before increasing slightly to 4.9% in 2010 (CIA 2013). The percentage of individuals who believed one or both misconceptions about AIDS grew from 4.9% to 5.4% between 2005 and 2006, decreased to 5.1% in 2007, and then steadily increased from 5.1% to 6% between 2007 and 2010 (PEPFAR 2011). So while there was one year, 2010, where a rise in AIDS rates was positively correlated with a rise in percentage of people believing one or both misconceptions about AIDS, there was a fairly consistent negative correlation between the two variables, which indicates that the data in this case does not support the hypothesis.

An analysis of the data on the first confounding variable shows that
poverty rates in the Central African Republic steadily decreased from 81.9% to 80.1% between 2005 and 2008, increased slightly to 80.5% in 2009, and then decreased again to 80.1% in 2010 (World Bank 2013). From this data, it can be concluded that poverty rates were mostly positively correlated with AIDS rates.

An analysis of the data on the second confounding variable shows that per capita healthcare expenditures in the Central African Republic were nearly stagnant, with expenditures staying at $14.00 from 2005 to 2006, a small increase to $17.00 in 2007, and another small increase to $18.00 in 2008, which is where it stayed until 2010 (World Bank 2013). This indicates that healthcare expenditures were mostly negatively correlated with AIDS rates, which is the opposite of what was expected.

An analysis of the data on the third confounding variable shows that the existence of interstate or civil war did not affect AIDS rates in the Central African Republic as AIDS rates dropped from 2005 to 2009, which is the same time that the Central African Republic was involved in the Central African Republic Bush War (Correlates of War 2013). In fact, the only year that AIDS rates rose, 2010, is also considered to be the official end of the war. This indicates a possible negative correlation between AIDS rates and the ending of conflicts within a given country.

Case: Uganda, 2005-2010

The percentage of citizens in Uganda infected with AIDS grew from 4.9% to 5.6% between 2005 and 2006, declined to 5.4% in 2007, then steadily increased from 5.4% to 7.1% between 2007 and 2010 (CIA 2013). The percentage of individuals who believed one or both misconceptions about AIDS grew from 3.4% to 4.3% between 2005 and 2008, dropped slightly to 4.2% in 2009, and then increased to 5% in 2010 (PEPFAR 2011). This shows that, for the most part, data collected for this case does support the hypothesis as there is a positive correlation between AIDS rates and percentages of individuals believing the misconceptions surrounding AIDS transmission. Furthermore, AIDS rates and the percentage of people believing one or both misconceptions are both relatively low when compared to other countries that have higher rates of both, e.g. South Africa. This indicates that while the correlation between these two variables is not 100% consistent, it is possible that this is evidence that higher percentages of people believing in AIDS misconceptions is in fact correlated with higher infection rates.
An analysis of the data on the first confounding variable shows that poverty rates drastically declined from 76.6% to 63.1% between 2005 and 2010, which indicates a negative correlation between poverty levels and AIDS rates as AIDS rates increased for five out of these six years (World Bank 2013).

An analysis of the data on the second confounding variable shows that per capita expenditures on healthcare increased steadily from $27.00 to $45.00 between 2005 and 2008, decreased slightly to $44.00 in 2009, then increased again to $47.00 in 2010 (World Bank 2013). This indicates that there was a mostly positive correlation between the AIDS rate in Uganda and the country’s per capita healthcare expenditures, the opposite of what was expected.

An analysis of the data on the third and final confounding variable indicates that there is a negative correlation between the existence of interstate and civil wars in Uganda as the AIDS rate in the country continued to rise despite the fact that the civil wars in neighboring Congo, which frequently spilled into Uganda, officially drew to a close in 2010 (Correlates of War 2013).

Case: Botswana, 2005-2010

The percentage of citizens in Botswana infected with AIDS steadily increased from 23% to 26% between 2005 and 2010 (CIA 2013). The percentage of individuals who believed one or both misconceptions about AIDS steadily increased from 23.5% to 28% between 2005 and 2010, which indicates that the two variables were positively correlated for all six years in Botswana (PEPFAR 2011). Therefore, the hypothesis finds support in this case, though it is difficult to tell from the data if the higher rates of individuals believing the AIDS misconceptions have temporal priority over the higher AIDS rates.

An analysis of the data on the first confounding variable shows that poverty levels increased from 35.6% to 38.3% between 2005 and 2007, decreased moderately to 37.2% in 2008, then steadily increased from 37.2% to 38.1% between 2008 and 2010 (World Bank 2013). Poverty rates in this time frame were therefore positively correlated with AIDS rates as, for the most part, AIDS rates increased along with poverty rates, though again it is impossible to tell which variable has temporal priority in this relationship.

An analysis of the data on the second confounding variable shows that per capita healthcare expenditures decreased from $420.00 to $399.00 between 2005 and 2006, then steadily increased from $399.00 to $615.00 between 2006 and 2010 (World Bank 2013). This indicates there is a negative correlation between the percentage of individuals infected with AIDS and the country’s per capita healthcare expenditures as the two variables were negatively correlated for five out
of the six years that were examined. This is, again, the inverse of the expected correlation.

An analysis of the data on the third confounding variable shows a negative correlation between the existence of interstate and civil wars and AIDS rates in the country as AIDS rates steadily increased despite the fact that the country was not involved in a war in any capacity between 2005 and 2010 (Correlates of War 2013). This is the opposite of the expected correlation.

Case: Lesotho, 2005-2010

The percentage of citizens in Lesotho infected with AIDS steadily increased from 22.9% to 25% between 2005 and 2010, with only a slight .2% decrease between 2006 and 2007 (CIA 2013). The percentage of individuals who believe one or both misconceptions steadily increased from 22.9% to 27.5% between 2005 and 2010 (PEPFAR 2011). This indicates that there is a positive correlation between AIDS rates and percentages of individuals that believe one or both misconceptions as both increased for five out of the six years examined in this study.

An analysis of the data on the first confounding variable indicates that the percentage of individuals living in poverty increased from 62.3% to 64.2% between 2005 and 2006, decreased to 60.9% between 2006 and 2008, and then steadily increased from 60.9% to 61.4% between 2008 and 2010 (World Bank 2013). This indicates that there is no consistent correlation between the two variables as the poverty rate both increased and decreased while AIDS rates were steadily increasing.

An analysis of the data on the second confounding variable shows that per capita expenditures on healthcare increased dramatically from $43.00 to $109.00 between 2005 and 2010 (World Bank 2013). This indicates that there is a positive correlation between per capita healthcare expenditures and AIDS rates as both consistently rose between 2005 and 2010. Again, this is the opposite of the expected relationship, and it is again impossible to determine from the data which variable holds temporal priority.

An analysis of the data on the third and final confounding variable shows that there is a negative correlation between the existence of interstate or civil wars and AIDS rates over time as AIDS rates consistently increased despite the fact that Lesotho was not engaged in conflict of any sort between 2005 and 2010 (Correlates of War 2013). Again, this is the opposite of the relationship that was expected.
Conclusion

After analyzing the data, it can be concluded with a low level of certainty that there is a positive correlation of indeterminate strength between the percentage of individuals in a country that believe in one or both of the misconceptions examined in this study and the percentage of individuals infected with AIDS in said country. The degree of certainty is low for a variety of reasons. First, only 25 out of 36 observations showed that such a correlation exists, and in approximately 5 out of 36 observations, there appeared to be a negative correlation between the two variables. So while a majority of cases did show a positive correlation of varying strength between the two variables, there were a small number of observations that showed precisely the opposite. This makes it difficult to say with a high degree of certainty that the positive correlation that might exist between these two variables does, in fact, exist.

Second, it is difficult to say to what degree the confounding variables influenced the DV as at least one confounding variable had the expected correlation with the DV in 28 of the 36 observations. Therefore, any of the confounding variables could have been responsible for variations in the DV.

Lastly, it is impossible to say that variations in the IV are responsible for variations in the DV. Not only is the correlation between the two variables weak and inconsistent at best, but it is impossible to determine from the data that changes in the IV have temporal priority over changes in the DV. The only other aspect of the data that could potentially be used as support for the hypothesis is that countries with particularly high AIDS rates, i.e. South Africa, Botswana, and Lesotho, do seem to have much higher percentages of citizens who believe in one or both of the misconceptions surrounding AIDS. This could be an indication that variation in the IV leads to variation in the DV, but again, because it is impossible to determine temporal priority, this finding does not support the hypothesis with certainty.

There were several potential limitations to this study. First and foremost, some scholars may question some of the operational definitions that were used for this study, such as the definition for civil and interstate wars, and some may disagree with the 5% threshold that was used to determine whether or not a country was experiencing an epidemic of AIDS. Other scholars could potentially disagree with the thresholds that were set for other variables, but since many of the categories that were created from those thresholds were not used due to the fact that there wasn’t enough variation in the data collected, such objections would be redundant.

Another limitation of this study is that there exists a huge array of
confounding variables, such as amount of foreign aid received, experience of medical personnel, and number of individuals who live too far from medical facilities to benefit from them, that were not examined. Any number of these confounding variables could have affected the data examined in this study, and any number of these variables could better explain variation found in the variables examined in this study.

Perhaps the most impactful limitation of this study is the fact that so few countries were examined. There are many other countries in sub-Saharan Africa that are currently suffering from AIDS epidemics that could not be analyzed due to the fact that data on all of the variables that were examined in this study were not available for them. This resulted in a sample size that is small enough that some would argue that any conclusions drawn from this study could not be generalized to the rest of sub-Saharan Africa.

The last severe limitation of this study is that it only examined a relatively small period of time. The fact that the data was restricted to only a six-year period makes it nearly impossible to determine which variables have temporal priority over others. This makes determining whether or not variation in one variable causes variation in another virtually impossible.

These results can be considered relevant to scholars and policymakers for various reasons. Scholars might find these results interesting because while this study failed to show with any certainty that variations in the IV cause variations in the DV, it does show that there is a slim possibility that the two are positively correlated with one another. Scholars with access to more time and resources than were available for this study might be interested in pursuing this possible explanation as a cause for AIDS epidemics because there is a possibility that variations in the IV of this study are at least one of the causes of variations in the DV. Lastly, the results of this study might be interesting to policymakers because they may wish to give funds to other scholars with the purpose of researching the effects of this IV on the DV.

But perhaps the most important conclusion that can be drawn from the results of this study is that there is a desperate need for more robust data collection in this field. Rigorous statistical analyses such as the one presented in this paper cannot be as effective as they must to combat AIDS epidemics without reams of data to support them. Results of studies such as this would be far more conclusive and useful were it possible, for example, to study the same variables over a thirty year period in every single country in sub-Saharan Africa. This would allow for the use of more powerful analytical tools and statistical analyses as well as more easily generalizable conclusions. Hopefully enough research of this nature will be conducted in the future to demonstrate
to policymakers that answers to the sorts of pressing questions presented in this study simply require far more information to find than is presently available.
Bibliography


