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## The influence of international aid allocations on mortality in Sub-Saharan Africa

Chelsea Wilson Kellum

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THE INFLUENCE OF INTERNATIONAL AID ALLOCATIONS ON MORTALITY  
IN SUB-SAHARAN AFRICA

By

Chelsea Wilson Kellum

A Thesis  
Submitted to the Faculty of  
Mississippi State University  
in Partial Fulfillment of the Requirements  
for the Degree of Master of Arts  
in Political Science  
in the Department of Political Science and Public Administration

Mississippi State, Mississippi

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IN SUB-SAHARAN AFRICA

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Does allocating large amounts of international aid specifically for fighting HIV/AIDS in Sub-Saharan Africa have an influence on mortality rates in this region?

This paper explores the relationship between total Official Development Assistance and Official Development Assistance earmarked for HIV/AIDS with AIDS mortality and overall mortality within Sub-Saharan Africa between 2000 and 2006. There are no definitive findings from this study to conclude that the amount of any form of assistance aid has a positive or negative effect on mortality. The results suggest that focusing on establishing greater development and less government corruption would more effectively alleviate the high mortality rates in Sub-Saharan Africa than increasing funding for HIV/AIDS.

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## LIST OF ACRONYMS

AfDF	African Development Fund
AIDS	Acquired immune deficiency syndrome
EC	European Commission
GFATM	The Global Fund to Fight AIDS, Tuberculosis, and Malaria
HIV	Human immunodeficiency virus
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
NEPAD	New Economic Partnership for African Development
OA	Official Assistance
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
UNICEF	The United Nations Children's Fund
UNFPA	The United Nations Population Fund
UNAIDS	The Joint United Nations Programme on HIV/AIDS
USAIDS	United States Agency for International Development
WB	World Bank
WHO	World Health Organization

## CHAPTER I

### INTRODUCTION

Sub-Saharan Africa is home to 11 percent of the world's population, 25 percent of the global burden of disease, 3 percent of the world's health workers, and less than 1 percent of global health expenditure (WHO 2006). It has disproportionately suffered the greatest amount from HIV/AIDS. Sub-Saharan Africa is home to 66 percent of known HIV positive individuals (UNAIDS 2009). Nine out of ten children in this region have lost one or both parents to AIDS. The most recent UNAIDS Report on the Global AIDS Epidemic indicated that the number of AIDS deaths are decreasing, and HIV prevalence is diminishing worldwide as a result of the six fold increase of financing for HIV programs from 2001-2007 (UNAIDS 2008).

AIDS is the leading cause of death in several Sub-Saharan Africa nations; however, there are numerous other diseases and health hazards that are responsible for high mortality rates as a whole. What is being done to reduce overall mortality? The spread of HIV/AIDS has taken the spotlight for infectious diseases; yet, there are many other communicable and non-communicable diseases that also attribute to the high death rates. HIV/AIDS has become a popular outlet for private donors, governments, and international organizations to rally behind and contribute funds to (Easterly 2006).

Aside from diseases and the funding they may attract, there are also other various events and circumstances that can be examined in order to better understand higher and lower mortality rates of Sub-Saharan Africa as well as in separate regions and states within it. These include the level of social and economic development, the presence of armed conflict, the level of health infrastructure, the amount of cultural fractionalization, population distributions, the amount of freedom in the press, and the level of corruption in governance. These situations and the spread of infections are compounding elements. The presence of one can create or worsen the level of another. For this reason it is vital that international aid be distributed and used most effectively in order to succeed in establishing the greatest good for the peoples of Sub-Saharan Africa.

The purpose of this research is to determine if international aid is being allocated in such a way as to decrease AIDS death rates at the expense of overall mortality rates not decreasing or decreasing disproportionately. A death, whether from AIDS or any other causation, is equal to a loss of life. To determine this outcome, we will be observing total Official Development Assistance (ODA) to Sub-Saharan Africa during the time period of 2000 to 2006 and ODA given directly for combating HIV/AIDS along with other contributing factors. ODA earmarked specifically for AIDS increased by more than 40% between 2000 and 2006 (WDI 2010). Health expenditure as a percentage of gross domestic product only increased by 0.1% from 2000 to 2006. According to the World Health Organization's statistics, AIDS mortality and overall mortality for Sub-Saharan Africa both continued to increase during this same time period (WHO 2010). Are international aid allocations specifically for fighting HIV/AIDS in fact crowding out aid needed in other sectors?

## CHAPTER II

### LITERATURE REVIEW

#### **Burden of disease**

The highest levels of mortality in the world are in Sub-Saharan Africa (Jamison 2006). The global burden of the AIDS epidemic is also highest in Sub-Saharan Africa (Lerner 2008). For some countries, the epidemic has eliminated the large gains in life expectancy that took place between 1950 and 1990 (Deaton 2009). More than 20 million Africans are estimated to be HIV positive. One and a half to two million Africans die from AIDS every year.

The burden of disease AIDS places on Sub-Saharan Africa is tremendous; however, many health specialists have raised arguments that other diseases in Sub-Saharan Africa are being neglected, including: malaria, tuberculosis, polio, measles, trachoma, respiratory infections, malnutrition, various parasitic diseases, and other emerging infectious diseases (Cole 2007, Rosenberg 2004, Weir 2004, Zingser 2005). According to the World Health Organization, more deaths were contributed to diarrhoeal diseases than AIDS in twenty Sub-Saharan African countries (WHO 2002). The mortality rate of tuberculosis in Sub-Saharan Africa has been rising by six percent each year (Cole 2007). Cancers, cardiovascular diseases, and neurological diseases, once primarily a burden only for the developed nations, are now increasingly prevalent in Sub-Saharan Africa as well (WHO 2002). The presence of HIV infection or the onset of

AIDS coupled with infection of any other disease magnifies the negative symptoms of one another (Lerner 2008). A weakened immune system increases the likelihood of contracting another disease, while an infection worsens the conditions of an HIV infected person.

Diseases also affect countries and regions within Sub-Saharan Africa at varying levels (Figures 1 and 2). HIV/AIDS is more prevalent in particular countries, but states with higher AIDS mortality may or may not also have higher total mortality rates and vice versa. The World Health Organization has established the meaning of good health to mean not just the absence of diseases, but also a state of physical, mental, and social well-being (Onwuliri 2005). There are many factors that contribute to overall health. Some of the largest contributing factors will be discussed later in this paper.

### **International aid**

The Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD) defines foreign aid as financial flows, technical assistance, and commodities that are designed to promote economic development and welfare as their main objective and are provided as either grants or subsidized loans (Radalet 2006). The DAC divides aid flows into three general categories. Official Development Assistance (ODA) represents aid provided by donor governments to low-income and middle-income countries. Official Assistance (OA) represents aid provided by governments to richer countries with per capita incomes higher than approximately \$9,000 and to prior Soviet Union nations or its satellite countries. Private Voluntary Assistance represents grants from non-government organizations, religious groups, charities, foundations, private companies, and individuals. Throughout history most foreign aid has been given directly from one

country to another in the form of bilateral assistance. Donors also provide aid indirectly, which pools resources together from many donors in the form of multilateral assistance.

Donors have continuously pledged to increase aid in the past decade. One of the most notable recent examples was in July 2005 when the heads of state of the Group of 8 industrialized nations promised to double aid to sub-Saharan Africa by 2010 and triple aid by 2015 (Sachs 2008). It is estimated that an investment of US\$25.1 billion would be required for the global AIDS response in low income and middle income countries to reach the country-defined targets by the end of 2010 (UNAIDS 2009). This would have been a lofty goal even before the global recession. Many argue, however, that simply increasing the amount of foreign aid alone will not solve the problems Sub-Saharan Africa is facing (Calderisi 2006, Koehn 1999, Richard 2009). In many areas foreign investment has not been working well, and new, innovative approaches are necessary to implement productive changes.

International aid allocated for HIV/AIDS has dramatically risen since the early 1990s (IMF 2007). Funding for HIV/AIDS in low-income and middle-income countries increased from US\$300 million a year in the late 1990s to US\$10 billion in 2007 (UNAIDS 2009). Recent trends in Development Assistance for Health (DAH) reveal the largest increase in funding was allocated to fight AIDS in Sub-Saharan Africa (Michauld 2003). Media attention for HIV/AIDS has also increased tremendously. Political leaders, such as former Prime Minister of Great Britain Tony Blair, former U.S. President George Bush, former U.S. President Bill Clinton, former South African President Nelson Mandela, etc., have used their international spotlight to rally support for the cause (Francis 2008, Easterly 2007). Celebrities such as Irish rock star Bono, singer/songwriter Elton John, actress Joanna Lumley, model Lisa Snowden, actor Will Smith, English

footballer Theo Walcott, and many others have sponsored or supported fundraisers and advocacy campaigns all around the world. Many have concerns over whether the funds for HIV/AIDS are new resources or diverted resources and have studied the issue without definitive findings (Lief 2006, Shiffman 2007).

The Bellagio Study Group believes the deaths of 5.5 million children could have been prevented if child survival had not lost its focus (Jones 2003). The group blames new complex and expensive AIDS intervention programs for being partly responsible for the diverted levels of attention. Only 10 percent of grants from The Global Fund to Fight AIDS, Tuberculosis and Malaria were used to fight tuberculosis (Rosenberg 2004). Over 50 percent of the fund went to HIV/AIDS. HIV/AIDS programs should not be supported by the West over other health preventions simply because it is a cause that makes them feel good to be a part of (Laney 2007). It needs to be determined if funds for HIV/AIDS are new money, that is to say more money is now being raised and used to fund the fight against AIDS, or if money that would have been put towards other health related issues is now being diverted to fight AIDS because it is a popular cause.

### **Economic Factors**

Income per capita in the world's high-income countries is approximately 65 times higher than income per capita in the world's low-income countries, which encompasses most of Sub-Saharan Africa (Chuhan 2006). Deep-rooted poverty weakens a nation's ability to battle many issues, including the spread of disease. This in turn can affect the economy, the environment, and health within surrounding states or the global community. The highest mortality rates of communicable diseases are in developing

countries, and the heaviest burden of infectious diseases fall on the poorest household within developing countries (Balachander 2006). Sickness leads to greater impoverishment through high costs of health care and the loss of income if one can no longer work. Poverty is not limited to the non-existence of necessary goods and services, but also encompasses vulnerability of risk, lack of voice in society, and powerlessness.

### **Social Factor - Education**

Education has an important social impact on health (Feinstein 2005). It usually effects health in conjunction with other variables; therefore, its impact is certain but difficult to analyze. Education influences the determinants of health, such as health behaviors, risky contexts, and preventative service use. Individuals who received more years of schooling usually have better wellness and healthier behaviors. Education can reduce the need for health care, the associated costs of dependence, lost earnings, and suffering. Educated individuals are also more likely to maintain and encourage healthy lifestyles and positive choices, fostering a community of greater well-being. Women who have received an education have fewer and healthier children (USAID 2001). Educated women are also more likely to send their children to school.

Education in the developing world may also contribute to sustaining democracies, increasing per capita income, and conserving environmental resources. Educating Sub-Saharan African's citizens would decrease poverty, reduce inequality, and lower crime rates. This, in turn, would encourage economic growth. Growth in the economy is directly related to better health.



### **Presence of armed conflict**

Wars, armed conflicts, and high incidence of political violence have stricken Sub-Saharan Africa; however, Sub-Saharan African has not been homogeneous in the amount of battles and skirmishes it has endured or the intensity of conflict it has experienced (Francis 2008). The Uppsala University Conflict Database reports that Africa has been home to more wars and armed conflicts than any other region in the world (UCDP 2010). Sub-Saharan Africa also has the highest number of internally displaced persons in the world and some of the largest refugee flows from conflict (Jackson 2006). As my discussion thus far suggests, armed conflicts do not merely increase mortality through an increase in violence, but also by virtue of ‘ratchet’ effects that negatively affect other indicators correlated with disease prevention.

Disease, spread of poverty, social inability, and limited medical infrastructure represent a greater threat to life than armed conflict in most African states; however, the New Economic Partnership for African Development (NEPAD) has found widespread evidence that war and political conflict is one of the main contributing factors to these types of situations (Jackson 2006). Conflict may not claim the highest mortality rates, but it ignites a downward spiral in other areas that may lead to the deaths of many, such as the destruction of rural economies and loss of food production. There is also a link with human insecurity and poverty (Salih 2008). To increase human insecurity one may give up essential needs. On the other hand, one’s poverty may deny the possibility of attaining human security. The implications of this can be seen throughout much of Sub-Saharan Africa. Conflict can place people in poverty. Poverty leads to exclusion of

certain individuals, which may enlarge grievances of a particular group. This, in turn, can continue the perpetuation of a conflict cycle.

### **Fractionalization**

The former colonial powers of Sub-Saharan Africa gave no thought to diversity of ethnicity, religion, or language when the dividing lines for the continent were drawn up. As a result many tribes and less formal societies were fractured. Higher levels of fragmentation have been found in developing nations along the equator, which would include several countries within this study (Alesine 2002). Ethnic fragmentation has been proven to impact the quality of a nation's institutions and its government activities (Canning and Fay 1993). Ethnolinguistic fractionalization has an inverse relationship with per capita gross domestic product according to another cross-country study (Easterly and Levine 1997). Ethnic and religious fragmentations are also correlated to increases in conflicts and civil wars (Alesine 2002). Economic factors and intensity of conflict directly impact levels of mortality, rendering fractionalization as an indirect cause.

### **Governmental Factors – Corruption & Press Freedom**

According to Transparency International, six of the top ten most corrupt governments are Sub-Saharan Africa nations (2009). It is estimated that corrupt practices cost the continent US\$150 billion a year (Hanson 2009). This number is inclusive of high ranking politicians skimming national funds to individuals bribing police officers. The presence of corruption also undermines the political process. Corruption is perceived by many to be the main challenge to economic growth (Poku 2008).

Very few Sub-Saharan Africa nations were categorized a free in the time period 2000 to 2006 (Freedom House 2009). Also, about 25% of the countries experience setbacks rather than progressive steps toward freedom. The level of press freedom serves as an indicator of the amount of power abuse by the government (Novel 2006). Freedom of the press influences many factors that affect health, thus affecting health indirectly. A study has found press freedom to be positively correlated with economic freedom, political stability, and government effectiveness. Press freedom was found to be inversely related with poverty and corruption. There was not a single country from this study with a high press freedom score and a high percentage of the population suffering from undernourishment or without access to clean water.

Lieberman (2009) similarly notes a connection between information availability and people's abilities to incorporate better health practices. Perhaps the most vivid example of how press and media can impact disease prevention is the South African case where former health minister Manto Tshabalala-Msimang suggested that traditional treatments including garlic and beetroot were effective treatments for HIV/AIDS. To be sure, such decidedly anti-scientific statements are compelled as much by political aspirations as willful ignorance. For many black politicians attached to liberation struggles in sub-Saharan Africa, HIV/AIDS is viewed as a 'western' disease whose treatments compel people to radically augment socially accepted behaviors. Moreover, from the perspective of politicians in South Africa, government mandated anti-viral treatments are prohibitively expensive.

## **Health Infrastructure**

Developed nations have a physician ratio of 3.7 per 1,000 people. Low-income nations have a physician ratio of 0.4 per 1,000 people (Chuhan 2006). One thing that results in low health worker ratios is the loss of human capital that Sub-Saharan Africa is undergoing. The strategic resource of human capital is flowing out of Sub-Saharan economies, where it is desperately needed to contribute to the advancement of human welfare, into developed nations' economies (Adams 1968). This problem has been ongoing since the time of colonialism. The economic and political environment will strongly influence the quantity and quality of talented professionals that chose to leave the continent (Patterson 2007). An estimated 65,000 African-born physicians and 70,000 African-born professional nurses were working outside the continent in the year 2000 (Clemens and Pettersson 2008). This represents approximately one fifth of African-born physicians, and approximately one tenth of African-born professional nurses. The fraction of health professionals abroad varies enormously across African countries, from 1 percent to over 70 percent according to the occupation and country. A depletion of particular specialists in an African country decreases the access to services of its citizens.

## **Urban Bias**

Sub-Saharan Africa's urban population is seeing tremendous growth, and it is expected to continue as the world's most rapidly urbanizing region for some years into the future according to United Nations estimates (Becker 1994). More than one-third of this region's population currently resides in cities (Hanson 2007). The effects of urbanization are not homogenous and normally include both positive and negative

factors. Urbanization is believed to foster economic growth. Certainly those within cities have greater access to goods and services; thus they are more likely to purchase and use them. Economists believe urban residents in Sub-Saharan Africa are at least marginally better off than those in rural areas, and that health metrics are higher for those in urban areas. However, when infrastructure becomes outpaced by growing demographics, urban populations may face problems with sanitation, safety, and resource shortages. Approximately 72 percent of the region's urban population lives in slum conditions (Laski 2007).

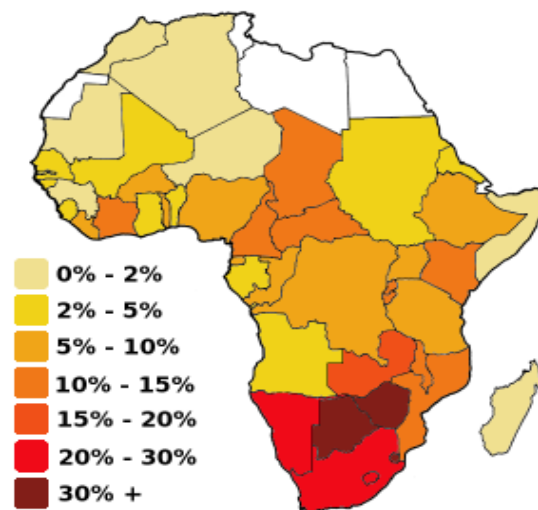


Figure 1 Choropleth of HIV/AIDS Prevalence in Africa

Notes: Map of Africa colored according to the percentage of the Adult (ages 15-49) population with HIV/AIDS. Countries colored white have no information available. Data from UNAIDS 1999, 2001, and 2002. Permission GFDL.

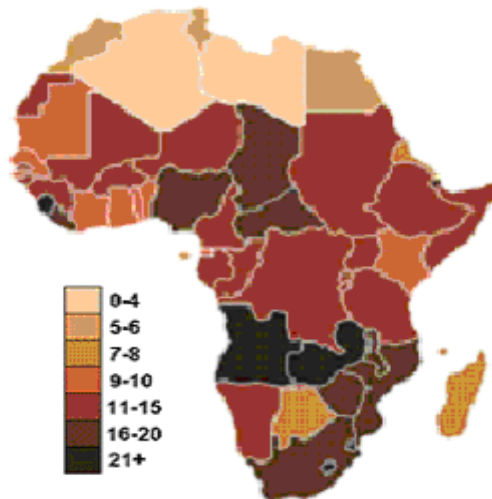


Figure 2 Choropleth of Overall Mortality in Africa

Notes: Map of Africa colored according deaths per 1,000 population per year. Data from most recent CIA figures. Permission GFDL from Nankail.

### CHAPTER III

#### EXPLANATION OF THE VARIABLES

Overall mortality rates of each Sub-Saharan African nation are used as the dependent variable in this study. The World Health Organization has compiled the total number of deaths per country for certain years (WHO 2002, WHO 2010). Almost all Sub-Saharan African countries have statistical data. For the few countries that do not have mortality rates listed, an average is calculated. Data from the years 2000 and 2006 is used. The percentage of change between the two years is analyzed. The World Health Organization Development Reports also include HIV/AIDS mortality rates for specific years. The number of deaths due to AIDS in 2001 and 2005 are looked at as a percentage of overall mortality. The prevalence of HIV as a percentage of the population was collected from the World Development Indicators Index (WDI 2010). This reflects the intensity of the problem HIV/AIDS poses in each country.

To grasp the amount of international aid resources flooding into Sub-Saharan African, total Official Development Assistance, net disbursements, measured in current USD, is collected from the Organization for Economic Co-operation and Development for the years 2002 and 2006 (OECD 2010). The amount of ODA given specifically for HIV/AIDS prevention and treatment is reported for 2000 and 2005 by OECD's Creditor Reporting System on aid activities (OECD 2010). Bilateral and multilateral funds are

combined for the total of each. A complete list of contributing agencies can be found in Table 1.

Because there is much more that contributes to the mortality rate of a country than the amount of international assistance it is give, several other independent variables are considered. The Human Development Index (HDI) of each country is calculated from the United Nations Human Development Reports (UNDP 2009). It is a measure of life expectancy, education, adult literacy, gross enrollment, and gross domestic product in a formula calculated by the United Nations Development Programme (UNDP). The HDI provides a well-rounded variable for measuring the socio-economic level of a country.

The number of battle deaths within a given year is considered. The Correlates of War lists this information (COW 2010). Because the real numbers do not indicate true intensity levels of conflict, we converted the number of battle deaths into a scale to include the average amount of conflict over the time period between 2000 and 2006 for better comparison: 0 = less than 100 battle deaths, 1 = 100-500 battle deaths, 2 = 501-2,000 battle deaths, 3 = 2,001-5,000 battle deaths, 4 = 5,001-10,000 battle deaths, and 5 = more than 10,001 battle deaths. As another conflict measure, military expenditure as a percentage of a nation's gross domestic product was also collected from the World Development Indicators Index (WDI 2010).

Population density data is extracted from the World Development Indicators Database and supplemented by the CIA World Factbook (WDI 2010). Population density is a demographic indicator measuring the concentration of populations with regards to land area. It is used as a partial indicator of human services offered in particular areas. Urban population percentages for each country are also used. These



values were also collected from the World Development Indicators Database (WDI 2010). This serves as another partial indicator of human services provided.

Ratios of physicians per 10,000 citizens and nurses/midwives per 10,000 citizens are gathered from the World Health Organization (WHO 2006). WHO lists health workers per capita during the years 2000-2007. In instances this is an average over that time span, in others, there is only one year that varies for differed Sub-Saharan Africa nations where these statistics were collected. Fewer health workers impede access to treatment and the speed with which one can expect to receive treatment.

Values for the level of fractionalization in a country for ethnic groups, religious groups, and language groups were collected (Alesine 2002). Each category receives a score from 0 to 1. A lower score reflects a more homogenous society in that category. A higher score reflects a more diverse or fractured society. For the purpose of this study, the three score were combined, and an average was taken to reflect overall fractionalization of each Sub-Saharan African state.

Public health expenditure data was collected from the World Development Indicators Index (WDI 2010). The amount of government health expenditure per capita and health expenditure as a percentage of gross domestic product are both considered.

Economic indicators include gross national income (GNI) and purchasing power parity (PPP) as collected by the World Bank's International Comparison Program Database (WB 2010). GNI is the sum of a country's gross domestic product and its income received from other countries less payments made to other countries. PPP takes the exchange rate of two or more currencies over a long period of time to equalize their

purchasing power. Both assist in determining the overall strength of the economy which may affect the success of development assistance for health in a country.

Government also has a significant role and contribution to make. The government corruption perception index (CPI) created by Transparency International measures the perceived level of public corruption. Its calculations are representative of thirteen different expert and business surveys. By 2006 most Sub-Saharan African nations had been given a CPI value (Transparency 2009). Because fewer countries have a score for 2000, the average difference between the 2 years for countries with both values was taken and applied. A higher CPI value represents less perceived corruption in each state.

Freedom House provides a Freedom of the Press Index, assigning each country a number that represents its level of press freedom (Freedom House 2008). This score is calculated based on the findings of 23 methodology questions in three subcategories: legal environment, political environments, and economic environment. A lower Press Freedom score is representative of greater press freedom in each country. A free press aids in maintaining and monitoring a healthy democracy. Free press also contributes to greater accountability, good government, and economic development.

## CHAPTER IV

### METHODOLOGY

My units of analysis included 42 of the 48 Sub-Saharan African nations. Djibouti, Equatorial Guinea, Liberia, Sierra Leone, Somalia, and Swaziland were omitted for lack of data. For the purpose of this study, we conducted two regression analyses. The central variables of interest are overall mortality rates and AIDS mortality rates of Sub-Saharan African states, each used as a dependent variable in a regression analysis. Our predicted outcomes for each set of relationships can be found in Tables 2 and Table 3. We first ran a factor analysis to see how the independent variables were associated with one another. For Eigenvalues greater than one, the scree plot revealed that approximately 5-7 variables would be distinct. We condensed the variables into several categories to show our new discoveries.

Factor one included economic and development indicators which include: Human Development Index 2000, Human Development Index 2006, Human Development average scores for the time period, Purchasing Power Parity 2000, Purchasing Power Parity 2006, and Gross National Income 2000. Factor two included variables revealing the level of health infrastructure, which were the average number of physicians per 10,000 population during the time period of study, the average number of nurses/midwives per 10,000 population during the time period of study, and the average

health expenditure per capita during the time period of study. Factor three indicated the level of freedom; it was comprised of Press Freedom scores for 2000, 2006, and the average of the two years. Factor four included variables relating to conflict: the average military expenditure 2000-2006, intensity of conflict 2000, intensity of conflict 2006, and the average intensity of conflict. Factor five represents variations in state populations, which include population density 2000, population density 2006, urban population 2000, urban population 2005, and the average urban population during the time period of study. Factor six serves as an indicator of corruption with the Government Perception Index values for 2000 and 2006 included. Factor seven resonated on AIDS. The variables included were AIDS mortality 2000, AIDS mortality 2006, and the average percentage of the population infected with HIV during the time period of study.

We then used these variables along with some of our other stand alone variables to run a basic regression analysis. We first ran a regression with overall mortality rates, our economic factor and our AIDS factor for Model 1. Our core model consists of overall mortality rates 2006, Human Development Index 2006, and our AIDS factor because it was a slightly better model, Model 2. We added each variable to our core model individually and then collectively to observe values of correlation (Table 4).

In the second regression analysis in which AIDS mortality rates is the dependent variable it was more difficult to distinguish a core model. It became obvious that the independent variables we used affect overall mortality and AIDS mortality in different ways. As similar to our first regression analysis, we began with observing how economic factors influenced AIDS mortality. Then, we added each variable individually and collectively to observe values of correlation (Table 5).

## CHAPTER V

### EXPLANATION OF THE FINDINGS

Economic Factors had a strong negative correlation to overall mortality as predicted (Table 2). As economic achievement and level of development increase, the number of total deaths decreases. AIDS Factors had a strong positive correlation to overall mortality as expected. Greater prevalence of the HIV virus and higher number of deaths from AIDS increases the overall mortality rate in a country. Apart from our core model, other variables were not significant when taken into account individually. Government Corruption became significant only when several other variables were factored in at the same time, indicating a spurious relationship. Although not quite on the 0.05 level, Fractionalization was often right on the margin for being significant when other variables were taken into account.

Of the remaining variables, some acted in accordance with predictions, and others did not. Fractionalization of ethnicity, religion, and language had a positive relationship with overall mortality as we expected. The greater the amount of diversity can lead to increasing levels of conflict and government corruption if leadership chooses to give better benefits to members of its tribal affiliations. Perhaps because of the vastness of HIV/AIDS across all ethnic groups, religions, and languages, this variable did not show great significance.

Press Freedom was negatively associated with mortality as we expected, but there was very little statistical significance for this. This variable may measure several different factors, confounding its effect. For instance, on one hand press freedom may allow for more widespread information about disease and treatment to help decrease infection and therefore death; however, press freedom might also indicate greater mobility of ideas and people increasing the number of contacts an individual has and therefore opportunities for sexual partners.

A higher percentage of a country's population living in urban settings was shown to decrease overall mortality in our model. This can be true because there is better health infrastructure in urban areas, increasing access to treatment and information. This variable may have failed to show significance because of other conflicting factors of urban life, such as intensified negative effects of unsanitary conditions or the spread of infectious diseases.

Conflict intensity continuously throughout the different models appeared to have a negative relationship with overall mortality, not at all what one would predict. The variable was not statistically significant and had a low coefficient. Perhaps its consideration of the number of battle deaths, which are included in overall mortality, distorted what this variable was trying to represent.

The level of health infrastructure was positively associated with overall mortality. Whereas we predicted that an increase in health infrastructure would lead to a decrease in overall mortality, this might be best explained by reason that HIV/AIDS, the greatest cause of mortality in Sub-Saharan Africa, is not a curable disease. The number of physicians and nurses, the amount of access to treatment, and the government

expenditure on health issues is insignificant in comparison to the problem. A patient with the onset of AIDS will eventually die no matter what level of health infrastructure a nation has established.

Total ODA and ODA specifically for AIDS were both positively correlated with overall mortality. These numbers were not close to being statistically significant and both had very low coefficients. Even still, one would hope to see a decrease in mortality with increases in funds to fight against it. Hopefully international aid has not been given and used in vain; rather, the amount of funds that have been given have just not been enough to correct Sub-Saharan Africa's problems.

AIDS mortality rates was used as the dependent variable for the second regression analysis. It was proven to be highly correlated with overall mortality as no surprise. An increase or decrease in any death rate will result in a positive correlation on overall mortality. Government corruption was the only other independent variable to show significance, having a direct relationship with AIDS mortality. Higher perceived corruption is associated with lower CPI Index score, expressing that as mortality rates increase the general public perceives less corruption in the government. This is contradictory to what we expected to find. It is likely that less corrupt governments give more detailed and truthful reports, perhaps reflecting that dictatorships and countries without many democratic freedoms do not report their number of deaths accurately. This could be caused by failure to spend government funds to properly collect statistics or an intentional cover-up of the countries' problems.

Press Freedom was the independent variable closest to significance, although only at the 0.1 level. According to our model, Press Freedom has a direct relationship with

AIDS mortality. A higher Press Freedom score indicates less freedom in the press. We would not expect as higher AIDS mortality rates to be associated with less press freedom. There may be interference with other variables, or this might indicate that press freedom is simply not very important when it comes to decreasing AIDS deaths.

Ethnic, Religious, and Language Fractionalization was shown to be either positively or negatively correlated depending on what other variables were included in the regression. Its association was not significant. There is no data that clearly predicts what association there should be. If you consider that increased fractionalization can lead to increased conflict, indirectly spreading HIV/AIDS through events such as soldiers raping women, one would predict a positive correlation. However, the more disassociated people are the less contact they are likely to have, which might decrease the number of sexual partners.

The presence of armed conflict, as with overall mortality, revealed the opposite correlation to AIDS mortality that expected. Higher AIDS mortality is shown to be associated with a decrease in conflict. However, the numbers are not close to significance and may not accurately be explaining anything other than AIDS is an even bigger problem in certain regions of Sub-Saharan Africa than even war.

Health infrastructure indicated an unusual relationship as well. As AIDS mortality increases, the level of health infrastructure decreases. Though not significant, this factor may enlighten the same as the Development Factor did that the more developed a society is, the more opportunity for the spread of infectious diseases. Although population did not express any real indication of a relationship, as we would



have thought more development would equal more people, and thus the increased spread of AIDS. This is not so with urban population.

ODA specifically for HIV/AIDS had a direct association and total ODA had a slightly inverse association with AIDS. It stands to reason that countries with higher HIV prevalence and AIDS death rates would receive a greater amount of funding for this issue. Total ODA funding is obviously not dependent on the AIDS health issue.

## CHAPTER VI

### CONCLUSION

This paper was designed to explore the relationship between ODA and mortality in Sub-Saharan Africa. In this paper I argued that allocation of international aid specifically for HIV/AIDS could be detrimental to overall mortality. Overall, the results indicated that ODA, in total or specifically for HIV/AIDS, seems to have no significant impact on mortality rates at all. ODA for HIV/AIDS is higher for countries with higher AIDS mortality and HIV prevalence, suggesting that more funds are given to countries with greater levels of need but not in a large enough amounts or through a mechanism that works well enough to alleviate the AIDS epidemic. A clear relationship between international aid and mortality rates cannot be drawn between these variables in this study. Consistent with the findings of Calderisi 2006, Koehn 1999, Richard 2009, and many others, simply increasing international aid for HIV/AIDS or any other health issue in Sub-Saharan Africa is not likely to drastically reduce mortality rates according to this research.

Other factors that we expected to contribute largely to mortality rates, such as presence of armed conflict, level of health infrastructure, and rapidly growing urban population, also did not suggest a high level of influence. This could indicate another model would have been more appropriate for this study or perhaps that these factors are just not strong enough to have a definitive impact on mortality. Developmental factors

and government corruption were found to contribute greatly to overall mortality and AIDS mortality respectively. An increase in the developmental level of a country results in a strong decrease in overall mortality. A population that perceives its government to be less corrupt has lower AIDS mortalities reported. These results have implications for the ways in which bilateral, multilateral, and even non-profit agencies and individuals allocate developmental assistance in the future. This research suggests that for the long term health of those living in Sub-Saharan Africa, it would be more productive to invest in increasing the development level and decreasing corruption through promoting democracy.

Indeed this is likely to intensify an ongoing argument for whose lives are more worthy of saving. ODA for HIV/AIDS or any other health malady are given now most often to prolong the lives of sick individuals or for immediate prevention to stop the spread of the disease and eliminate its influence. The breadth of application of this relationship between international aid and mortality is another question though. Does it apply only to Sub-Saharan Africa or to the wider developing world? Does it apply only to ODA earmarked for HIV/AIDS or are would other earmarked sectors produce similar results? My expectation is that this would apply to other sectors that receive international aid allocations and might also have a similar result in other parts of the developing world. For many, though, this may be a question of moral hazard. With limited funds most are likely to agree that it is necessary to use our resources most effectively, but decision makers in developed nations may not be willing to allow more individuals to die now so that many more deaths could be prevented later.

Table 1 Official Development Assistance Contributors

<b>Bilateral Contributors</b>	<b>Multilateral Contributors</b>
Australia	AfDF
Austria	EC
Belgium	GFATM
Canada	IBRD
Denmark	IDA
Finland	UNICEF
France	UNFPA
Germany	UNAIDS
Greece	
Ireland	
Italy	
Japan	
Luxembourg	
Netherlands	
New Zealand	
Norway	
Portugal	
Spain	
Sweden	
Switzerland	
United Kingdom	
United States	

Table 2 Hypotheses for Regression Analysis 1

<b>Variable</b>	<b>Operationalization (Source)</b>	<b>Expected Influence</b>
Overall Mortality	Avg. number deaths per 10,000, 2000-2006 (WHO)	-
AIDS Mortality	Avg. number deaths per 10,000, 2000-2005 (WHO)	Positive
Development	Human Development Index (UNDP)	Negative
Conflict	Avg. battle deaths during 2000-2006 (COW)	Positive
	Military Expenditure as percent GDP (WDI 2010)	Positive
Population Distribution	Population density per square km (WDI)	Negative
	Urban population as percentage (WDI)	Negative
ODA Total	Total Assistance in US\$ (OECD)	Negative
ODA AIDS	Assistance for HIV/AIDS in US\$ (OECD)	Negative
Health Expenditure	Health Expenditure per capita (WDI)	Negative
	Health Expenditure percent GDP (WDI)	Negative
Corruption	Corruption Perception Index (Transparency Int.)	Positive
Democracy	Press Freedom Score (Freedom House)	Negative
Economy	Purchasing Power Parity current world values (WDI)	Negative
	Gross National Income current US\$ (WDI)	Negative
Fractionalization	diversity of Ethnicity, Religion, & Language (Alesine 2002)	Positive
Health Workers	Number of physicians per 10,000, 2000-2007 (WHO)	Negative
	Nurses/midwives per 10,000, 2000-2007 (WHO)	Negative

Table 3 Hypotheses for Regression Analysis 2

<b>Variable</b>	<b>Operationalization (Source)</b>	<b>Expected Influence</b>
AIDS Mortality	Avg. number deaths per 10,000, 2000-2005 (WHO)	-
Overall Mortality	Avg. number deaths per 10,000, 2000-2006 (WHO)	Positive
Development	Human Development Index (UNDP)	Negative
Conflict	Avg. battle deaths during 2000-2006 (COW)	Positive
	Military Expenditure as percent GDP (WDI 2010)	Positive
Population Distribution	Population density per square km (WDI)	Positive
	Urban population as percentage (WDI)	Positive
ODA Total	Total Assistance in US\$ (OECD)	Negative
ODA AIDS	Assistance for HIV/AIDS in US\$ (OECD)	Negative
Health Expenditure	Health Expenditure per capita (WDI)	Negative
	Health Expenditure percent GDP (WDI)	Negative
Corruption	Corruption Perception Index (Transparency Int.)	Positive
Democracy	Press Freedom Score (Freedom House)	Negative
Economy	Purchasing Power Parity current world values (WDI)	Negative
	Gross National Income current US\$ (WDI)	Negative
Fractionalization	diversity of Ethnicity, Religion, & Language (Alesine 2002)	Negative
Health Workers	Number of physicians per 10,000, 2000-2007 (WHO)	Negative
	Nurses/midwives per 10,000, 2000-2007 (WHO)	Negative

Table 4 Models for Dependent Variable Overall Mortality

<b>Variable</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
AIDS Factor	100.23*** (13.88)	97.66*** (13.41)	89.87*** (13.69)	98.48*** (14.83)	98.63*** (15.63)
Economic Factor	-63.92*** (13.60)				
Human Development Index		-546.33*** (108.24)	-559.81*** (196.32)	-405.44 (210.85)	-418.95 (227.11)
Fractionalization			121.58 (67.66)	132.78 (67.56)	109.19 (83.57)
Conflict			-21.00 (17.50)	-20.91 (21.87)	-18.65 (23.63)
Health Infrastructure			5.80 (23.01)	28.65 24.14	28.26 (25.20)
Press Freedom				-0.76 (1.00)	-0.80 (1.06)
Urban Population				-149.50 (108.90)	-143.57 (119.00)
Government Corruption				-58.16* (25.19)	-56.40* 26.45
Total ODA					0.003 (0.008)
AIDS ODA					0.076 (0.316)

Table 5 Models for Dependent Variable AIDS Mortality

<b>Variable</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
Human Development Index	-2112.93 (5130.82)	-2133.63 (5290.95)	2000.64 (8823.71)	8299.65 (6778.72)
AIDS ODA			9.57 (11.47)	3.65 (8.74)
Government Corruption	1760.29* (863.48)	1757.74* (898.76)	1790.88 (948.19)	1705.79* (716.36)
Press Freedom	29.66 (31.56)	29.55 (32.50)	71.47 (38.74)	47.50 (29.64)
Total ODA		-0.01 (0.30)		
Fractionalization			2559.70 (3118.22)	-1013.86 (2457.84)
Conflict			-1663.43 (857.88)	-467.99 (689.30)
Health Infrastructure			-262.67 (980.29)	-557.87 (742.68)
Urban Population			-3929.16 (4578.60)	599.87 (3571.10)
Overall Mortality			18.35*** (3.19)	17.97*** (3.53)



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