TRENDS IN CONDOM USE: 
THE ASSOCIATION IN MALAWI OF CONDOM USE 
WITH AIDS KNOWLEDGE AND 
THE RELATIONSHIP TO THE GLOBAL GAG RULE

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Sarah Catherine Foster, B.A.

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Sarah Catherine Foster, B.A.

Thesis Advisor: Robert Bednarzik, Ph.D.

ABSTRACT

This study uses data from the Malawi Demographic and Health Surveys for men and women in 2000 and 2004. Using a logit model it examines the relationship between the characteristics of individual Malawians and their condom use overtime. Over twenty-five years since the discovery of HIV/AIDS, prevalence rates for the infectious disease are at a historical high of 14.1 percent in adults ages 15 to 49 in Malawi. The Government of Malawi relies heavily for health care support on financial aid and in-kind donations from international organizations and donor governments to help combat the spread of HIV. In 2001, U.S. President George W. Bush reenacted the Mexico City Policy and then in 2002 stopped all U.S. funds going to the United Nations Family Planning Association. Both of these international family planning policies had detrimental effects on the developing world, reducing capacity and supplies in some of the poorest countries in the world. This paper evaluates the impact of that policy in Malawi overtime. It also analyzes individual characteristics that drive the demand for condoms. The results of this paper show that higher levels of education, access to
condoms, condom use history, and being tested for AIDS are all positively associated with condom use. This knowledge will help the Government of Malawi to improve the targeting and design of preventative HIV/AIDS public health programs. The findings further support previous research on the negative consequences of the Bush administration’s resigning of the Global Gag Rule and the 2002 defunding of the United Nations Family Planning Association.
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Chapter 1: Introduction

In its 2008 Report on the global AIDS pandemic, the Joint United Nations Program on HIV/AIDS (UNAIDS) reported that in 2007 the worldwide prevalence of the human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) reached an estimated high of 33 million people. While HIV/AIDS is a global pandemic, it affects Sub-Saharan Africa more than any other region in the world. Sixty-seven percent of all people living with HIV/AIDS reside on the African continent. In 2007, 72 percent of AIDS deaths occurred in Sub-Saharan Africa (Joint United Nations Programme on HIV/AIDS, 2008). Twenty-five years since the infectious disease was first discovered the question remains of how to develop and implement effective prevention programs, to stop or even slow its spread.

The first case of AIDS has been traced to the Democratic Republic of Congo around 1960. Scientists believe that it is since the 1970s that the disease has been spreading rapidly throughout the world (Buve, Bishikwabo-Nsarhaza, & Mutangadura, 2002). The Government of Malawi first acknowledged the pandemic in 1985, but took little action to slow the transmission of HIV. Finally, in 2000 the government of Malawi created the National AIDS Commission to ensure there was a full-time staff working on the issue. Since then there have been two five-year strategic plans. Unfortunately, the prevalence rate has continued to increase. In 2005, it was recorded
at 14.1 percent for adults age 15 to 49 years (UNAIDS, 2006). But without a vaccine, cure, or the widespread availability of antiretroviral drugs (ARVs) in developing countries, especially those of Sub-Saharan Africa, it is critical to determine the characteristics of high-risk groups for successful targeting of public health campaigns and interventions. This is necessary because one key to controlling HIV/AIDS is prevention.

According to the United Nations Population Fund (UNFPA), condoms are currently recognized as one of the most readily available and effective mechanisms to prevent the spread of HIV (United Nations Population Fund). Researcher Anne Philpott argues that there is a gap in the literature analyzing the demand for condoms (Philpott, Knerr, & Maher, 2006). This paper will help to fill this gap by investigating the association between condom demand and characteristics of those who use condoms in Malawi.

AIDS is killing generations of Africans who would otherwise be contributing to economic growth. AIDS is taking workers out of the most productive years of their work lives in countries that are in need of a productive labor force.

The International Labor Organization (ILO) estimates that in the next decade 15 of the countries most highly affected by AIDS, including Malawi, will have 24 million fewer laborers in the workforce because of the pandemic. Researchers have estimated that over the next ten years South Africa’s gross domestic product (GDP)
will be 17 percent lower than it could have been in the absence of AIDS (Piot, Bartos, Ghys, Walker, & Schwartlander, 2001); and that by 2010 Malawi will be losing 0.7 percent of per capita GDP annually due to the loss of productive laborers (Buve, Bishikwabo-Nsarhaza, & Mutangadura, 2002).

The 2005-2009 Malawi National HIV/AIDS Action Framework, reports that there are 80,000 AIDS deaths annually in Malawi. As a result the national life expectancy has decreased from 56 years prior to the AIDS pandemic to 40 years (National AIDS Commission, 2007). The pandemic takes laborers out of the workforce as well as imposing direct costs, such as health care, on an already financially strained economy. In 2005, only 4.6 percent of gross domestic product (GDP) was used for health care services, while 9.6 percent of GDP was used for repaying debts to international donors (Campaign, 2007).

In addition to economic devastation there are increasing hardships placed on families to care for the sick and the orphaned. Families’ financial burdens include everything from lost wages to funeral expenses. In Malawi, the most recent estimates suggest that there are over 840,000 orphans, of whom 45 percent have lost their parents to AIDS (National AIDS Commission, 2007). The pandemic also takes teachers who are ill away from schools. It forces children to stay home to take care of affected family members instead of attending class. These negative effects to the country’s education are multiplied by the loss to teachers and students, who then shoulder the
burden with less education (Piot, Bartos, Ghys, Walker, & Schwartlander, 2001). It also exacerbates the level of infection in other diseases, such as tuberculosis and malaria. The incidence of tuberculosis in Malawi has risen to the unprecedented level of over 27,000 infections annually (USAID, 2008).


[AIDS is] A development issue because it is weakening institutions and destroying institutional memory in both the public and private sectors—destroying their capacity to formulate, analyse and manage public policies, and develop programmes and strategies essential for economic growth (National AIDS Commission, 2007).

Health Implications of HIV/AIDS

HIV weakens it victims’ immune systems, causing them to develop life threatening infections, including AIDS. After the onset of AIDS, victims’ immune systems break down, making them susceptible to further infections and tumors which eventually lead to death. There is currently no known vaccine or cure for HIV or AIDS. There is, however, Antiretroviral Therapy (ART) including the prescription of ARVs which can improve the victim’s quality of life and prolong survival. ARVs are expensive and not readily available in all countries. In 2005, Dr. Mark R. Dybul, the then United States Global AIDS Coordinator who led the implementation of the U.S. President’s Emergency Plan for AIDS Relief (PEPFAR), reported that the annual cost per person of ART treatment in Africa was $1,500–$2,500, with ARVs accounting for
$300–$600 of the total cost. The remainder of the treatment costs is related to administration of the treatment and health care workers (Fleshman, 2005). According to the World Health Organization (WHO), only 43 percent of known HIV-infected persons were receiving ART treatment in Malawi at the end of 2006 (USAID, 2008).

Treating people living with AIDS using ARVs is critical in the fight against the syndrome. The treatment regimen faces two broad challenges. First, once one begins to receive ART, the patient must continue the treatment in order to stay alive. Treating individuals with ART is a lifelong commitment. Second, expanding coverage to all who are infected is an expensive undertaking. The price of treatment continues to decrease as new generic drugs are produced and demand rises. But, if developing nations lose funding or assistance for treatment, the financing gap reduces their potential to continue or to expand treatment.

HIV/AIDS in Malawi

Another challenge in combating HIV/AIDS is the variation of the leading causes behind transmission throughout the world. The social factors that may be associated with transmission of the virus can be vastly different across countries. While in some nations HIV spreads mainly through intravenous drug use, in others it is transmitted through homosexual relationships or, as is the case in Sub-Saharan Africa, through heterosexual relationships.
The cone of Africa has the highest HIV/AIDS rates in the world, while West African countries have prevalence rates lower than five percent, closer to those of the developed world (Buve, Bishikwabo-Nsarhaza, & Mutangadura, 2002). With such differences from country to country on the same continent, the current state of the pandemic does not allow for broad generalizations about effective prevention programs across the globe or in Sub-Saharan Africa.

In Malawi, the primary mode of HIV transmission is through unprotected heterosexual sex. The 2000 Malawi Demographic and Health Survey (MDHS) reported heterosexual intercourse was responsible for 90 percent of new infections and mother-to-child transmission for nine percent (National Statistical Office [Malawi] and ORC Macro, 2002). In a longitudinal study measuring the effect of HIV/AIDS survival in Malawi, prevalence was estimated at 0.1 percent from 1981-1984, two percent from 1987-1989, and 10-13 percent in 2002 (Crampin et al., 2002). In 2005, HIV/AIDS prevalence for Malawi was estimated at 14.1 percent for adults age 15 to 49 years, one of the highest adult infection rates in the world (UNAIDS, 2006). HIV has spread quickly throughout the country, first in urban areas then moving into rural communities. The most vulnerable groups were those with the greatest mobility, the wealthiest, and those who had the highest levels of educational attainment. The pandemic in Malawi was initially characterized by urban, highly educated, and wealthy men and women. This has changed as the virus has spread into rural communities and
impoverished households (Republic of Malawi Office of the President and Cabinet, 2007).

Lack of health care access is an enormous barrier to the treatment of HIV/AIDS, especially in rural areas (USAID, 2008). The Government of Malawi is constrained in terms of the personnel and finances it needs to test and treat all of those infected. There is one health care professional for every 50,000 Malawians (Joint United Nations Programme on HIV/AIDS, 2008). There are an estimated 90,000 new infections each year (Department for International Development, 2006). With this rapid growth rate, attention needs to be placed on cost-effective interventions geared at prevention. With limited access to health care the general population must be given the proper education, information, and tools to combat infection (World Health Organization, 2005).

One aspect of the strategy for prevention is targeting individuals’ sexual behavior. Younger generations are more likely to adopt different habits with new information. Knowledge about safe sexual practices should start in primary school with the promotion of delaying sexual activity and the importance of having only one partner (Piot, Bartos, Ghys, Walker, & Schwartlander, 2001).

Behavior change is a challenging task and one that can take generations (Buve, Bishikwabo-Nsarhaza, & Mutangadura, 2002). Table 1, from the Malawi Demographic and Health Survey 2000 and 2004, provides information on respondents’ reasons for
condom use in their last sexual encounter. The chart gives an insight into attitudes about safe-sex practices.

Table 1: Reasons for condom use across gender and time

<table>
<thead>
<tr>
<th>Number of Condom users or non-users</th>
<th>Gender</th>
<th>2000</th>
<th>2000</th>
<th>2004</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>Total who did not use a condom</td>
<td>2,122</td>
<td>9,936</td>
<td>2,214</td>
<td>8,729</td>
<td></td>
</tr>
<tr>
<td>Total who did use a condom</td>
<td>362</td>
<td>522</td>
<td>374</td>
<td>438</td>
<td></td>
</tr>
</tbody>
</table>

Reason for Condom Use* | Percent Distribution
To prevent an STD | 35.6 | 20.3 | 39.0 | 20.5 |
To avoid pregnancy | 38.4 | 51.0 | 38.8 | 48.6 |
To avoid both STD and pregnancy | 21.0 | 19.5 | 15.2 | 17.6 |
Does not trust partner | 2.3 | 1.5 | 1.1 | 2.1 |
Partner requested or insisted | 1.9 | 3.1 | 2.7 | 3.2 |
Other | 1.4 | 4.6 | 3.2 | 5.7 |

*Reason for condom use only includes those who used a condom.

Table 1 is striking in showing that the overwhelming percentage of respondents did not use a condom; moreover, it does not indicate an increase in condom use between 2000 and 2004 for males and shows decreased use for females (National Statistical Office [Malawi] and ORC Macro, 2000 and 2005). The percent distribution shows that women primarily want to avoid pregnancy and men sexually transmitted diseases (STDs). This minimal level of condom use is likely to stem from lack of knowledge, cultural barriers and stereotypes about condoms, as well as issues of access and affordability. All data in this paper come from the Malawi Demographic and Health Survey (MDHS), which is discussed further in the Data Source section.
The decline between 2000 and 2004 may be related to the Mexico City Policy re-implemented by U.S. President George W. Bush in 2001. The policy cut funding to non-governmental organizations (NGOs) which did not follow its anti-abortion provisions. Marie Stopes International and International Planned Parenthood Federation (IPPF) are two of the largest NGOs in Malawi. Banja La Mtsogolo, the local NGO of Marie Stopes International, operates 30 clinics in Malawi (Marie Stopes International, 2009). This cut in funding would have affected Banja La Mtsogolo and other clinics that were supported by international donors who were defunded by the U.S. under the Mexico City Policy. Although the policy was aimed at halting certain family planning practices, clinics in most developing countries, especially those in rural communities, provide all of the health care services for the community. Clinics do not provide only family planning services, but basic services as well. Therefore a loss for a family planning clinic would affect all of the services it provides, including those related to HIV/AIDS education programs. Fighting the HIV/AIDS pandemic is not only about condoms, but about proper education, eradicating cultural barriers and stereotypes, and improving access to health services.

Having knowledge of current practices and characteristics of those who use and do not use condoms provides for improved targeting of public health programs. Understanding the reasons behind the low percentage of condom use is critical to creating effective campaigns to curb the transmission of HIV through safe-sex
practices. The MDHS for 2000 and 2004 reported that over 70 percent of respondents answered that they knew the chance of AIDS transmission was reduced by using a condom; however, only a very small percentage of them, 1,649 people, said they had used a condom. Whereas 20,992 people said they did not use a condom during their last sexual intercourse. This large difference is a major cause for concern (National Statistical Office [Malawi] and ORC Macro, 2005).

This disconnect between low levels of condom use and high levels of knowledge about the protection that condoms provide against HIV transmission raises questions about what is the driving force behind condom use and what can be done to promote behavior change. This paper will examine condom use in Malawi in 2000 and 2004 to investigate the effect of the Mexico City Policy. The analysis will look at the change in condom use over this time frame. It will also determine characteristics of those most likely to use condoms. This study will provide information to the Government of Malawi to help improve potential targeting and structuring of HIV/AIDS public health programs. Evaluation of the Mexico City Policy will provide insight into the spillover effects of U.S. international public health policy. The paper is organized into the following sections: background on HIV/AIDS in Malawi and the Mexico City Policy; literature review; hypothesis, data sources, and methodology; analysis; policy recommendations; and conclusion.
Chapter 2: Background

Condoms Prevention Potential

In a 2004 position statement UNAIDS, the WHO, and UNFPA asserted, “the male latex condom is the single, most efficient, available technology to reduce the sexual transmission of HIV and other sexually transmitted infections” (WHO, UNAIDS, & UNFPA, 2004). The Population Council, a nongovernmental nonprofit research organization, cited in a 2004 study that condoms are 90 percent effective in preventing HIV transmission. This effectiveness rate was determined from the Populations Council’s evaluation of other studies. The highest reported effectiveness rate was 94 percent; the lowest reported rate was in the range of 80 to 87 percent. From these reports and other research, the Population Council determined that a 90 percent rate of effectiveness in the prevention of HIV transmission with condoms was a reasonable estimate (Hearst & Chen, 2004). These numbers provide insight into the potential protection condom use provides against HIV transmission, even if one assumes the lower-end estimates (Weller & Davis, 2003). However, there are two caveats to these high efficacy percentages: condoms must be used consistently and correctly.

Emily Oster’s (2005) research on sexual behavior and HIV/AIDS supports the hypothesis that as the number of sexual partners increases, so does the likelihood of
acquiring HIV. She estimates that the transmission rate for unprotected sex is around 30 percent.

Prevention is the most effective weapons against the HIV/AIDS pandemic. The majority of studies agree that condom use is a vital preventive tool in the fight against HIV/AIDS. Studies differ on how much emphasis should be put on condom use and sexual education components geared at behavior change. To stop the spread of the pandemic there needs to be an understanding of human behavior characteristics that facilitate transmission of the virus (Decosas, 2002).

The UNFPA claims that 13 billion condoms are needed each year in the developing world to stop the spread of HIV and other sexually transmitted infections (STIs). In 2004, only 2.1 billion condoms were provided by bi-lateral donors in Sub-Saharan Africa. That is equivalent to a low-level of ten condoms for each member of the projected sexually active population a year (United Nations Population Fund, 2002). The challenges of condom use and distribution are not only about educating the population about safe-sexual practices; there must also be a steady supply of condoms available. The supply challenge is increasingly being met by donors, but remains an ever-present concern. Supply side constraints are focused on the price and availability of condoms.
Supply and Demand of Condoms

On the supply side it is critical for the Government to have access to low cost and high quality condoms. Condom use is highest in poor communities when they are free or the cost is subsidized. When demand is increased through education, communication, and public health programs, it is essential to provide an adequate supply to the population (United Nations Population Fund, 2002).

Along with education about reducing sexual partners and long-term concurrent relationships, condoms play an important role in safe sexual practices. One critical goal through the creation of effective HIV education programs is to generate a demand for condoms. The emphasis on education is important, promoting condoms with positive associations to pleasure or love, as opposed to negative associations with disease and death have been proven to raise demand (Population Action International, 2007).

Another demand side constraint includes stigmas and social and psychological costs (Agha, Kusanthan, Longfield, Klein, & Berman, 2002). Successful demand side interventions in Thailand, Cambodia, and Uganda, were able to destigmatize condoms so that they were no longer seen as used only by those who were promiscuous (WHO, UNAIDS, & UNFPA, 2004). Other successful programs have promoted condoms for pleasure or as a sign of love and trust between married couples. Breaking down these demand side barrier constraints will be necessary for the Government of Malawi to create effective HIV/AIDS education programming. Overcoming these demand
constraints is critical to effective prevention education programming. Education about HIV/AIDS and safe sexual practices are not mutually exclusive from condoms. They must be used together to curb transmission.

**U.S. International Family Planning Policy**

**Mexico City Policy**

The Mexico City Policy was established by Ronald Reagan in 1984 in Mexico City, Mexico. The policy, commonly referred to as the Global Gag Rule, prohibited funding to non-governmental organizations (NGOs) that provided abortion services. The policy set out that NGOs could not use any funding, from U.S. or other donors to:

- provide abortion counseling or referrals,
- advocate for changes in abortion policies or practices of the government, or
- any abortion related services (Cohen, 2006).

Only NGOs that signed onto the Global Gag Rule where allowed to continue receiving funding and supplies from the U.S. government.

Since President Reagan signed the policy into law, it has become partisan legislation, with a repeal signed by President Clinton, and then a reversal signed by President George W. Bush, on the anniversary of *Roe v. Wade* (Cohen, 2006). President Barack Obama signed another repeal of the law yet again in 2009, to great fanfare and acclaim by the international family planning and health community (Nasaw, 2009).
The argument around the Global Gag Rule is similar to the heated debate that engulfs the abortion discussion in the United States. Those opposing the policy state that it is ultra-conservative; arguing that the policy implies that the poor are responsible for their plight and it is therefore not the state’s responsibility to provide support for correcting personal ills (Girard, 2004). Advocates of the policy believe that it will decrease the number of abortions. It is important to note that the Global Gag Rule could not be applied to family planning policy in the United States because it is unconstitutional (Center for Reproductive Rights, 2000).

**United Nations Population Fund**

In 2002 President George W. Bush cut funding to the United Nations Population Fund (UNFPA). The move arose from unfounded allegations of UNFPA’s activities in China. UNFPA is the world’s largest international source of population funding assistance with an annual budget of U.S. $389 million. It works only in those countries where it has been invited by the government (Bishop, 2003). UNFPA works with governments to develop policies geared at poverty reduction, as well as the collection and evaluation of population data. UNFPA goals include: universal access to health care, reducing infant and maternal mortality, universal primary education, increasing life expectancy, and reducing HIV/AIDS. The gap in resources created by President Bush’s decision to stop contributing to the UNFPA was detrimental to the organization. The U.S. was the largest donor, in terms of absolute dollars, to the
UNFPA. The UNFPA lost over U.S. $130 million in three years due to the Bush administration’s decision (Population Action International, 2005).

Effects of Policies

Those in the international family planning community were outraged with the changes that resulted from President Bush’s decision. Two NGOs which were greatly affected by the policy were Marie Stopes International and International Planned Parenthood Federation (Crane & Dusenberry, 2004). The disappearance of funding was visible, but it took time for the true negative effects of the policies to surface. There has been a great deal of qualitative research on the subject, but there is a gap in the empirical analysis of the policies (Girard, 2004). A critical effect of the policies was that it affected both family planning and HIV/AIDS services. In the developing world, these services are closely tied together; a cut in funding for one program directly affects the capacity of the second program. Although these policies were aimed at family planning and abortion services, it affected clinics’ capacity for all services, including HIV/AIDS.

Clinics Close and Cut Staff

The first and most visible effect of the policies was the closure and reduced capacity of health clinics in the developing world. This occurred in areas where there was already a large void in health care services (Crane & Dusenberry, 2004). These NGOs often provide family planning and HIV/AIDS services. When funding was cut
all of the services were hurt, not simply family planning (Crane & Dusenberry, 2004). The closure and reduced capacity resulted in women losing access to quality contraceptive services (Cohen, 2006). In addition, a majority of the clinics were the only place to receive HIV/AIDS counseling and services (Jones, 2004). These negative consequences of the policy were theorized to be large (Bishop, 2003).

**Contraceptives**

USAID and UNFPA are the two largest donors of contraceptives to the developing world. USAID drastically reduced its supply of contraceptive donations when President Bush re-implemented the Global Gag Rule. In 2000, it was projected that the supply of condoms, 950 million to the developing world, met only one-eighth of the demand, including those needed to significantly reduce the transmission of HIV. After the funding cut from the United States, UNFPA was forced to also decrease its supply of condoms. As a result, the supply of condoms was significantly reduced while the global demand continued to increase (Population Action International).

This reduction in condom supply led to an increase in unwanted pregnancies, unsafe abortions, and maternal illnesses and death (Population Action International, 2005). The UNFPA estimated that the defunding of the organization from the U.S. resulted in two million unwanted pregnancies, 800,000 illegal abortions, and 77,000 infant and child deaths (Crossette, 2004/05).
Chart 1, shows that condom use decreased between 2000 and 2004. This may be a direct result of the decrease in the availability of condoms, the closure of family planning clinics, and a concomitant decrease in education programming due to NGOs loss of financial support.

**Chart 1: Percentage of male and female condom use, Malawi 2000 and 2004**

Data Source: Malawi Demographic and Health Survey 2000 and 2004

NGOs that did not sign onto the Global Gag Rule lost all funding and donated contraceptives (Population Action International, 2005). Access to contraceptives is a critical component of the fight against HIV transmission, in addition to the benefits it provides to family planning. Governments often cannot fill this gap in the demand for contraceptives because of budgetary constraints. NGO clinics in the developing world rely on the donations from USAID, UNFPA, or their parent NGO to provide
contraceptives that their governments cannot afford. It is difficult to teach about the public health benefits of contraceptives if they are not available in the country.

Promotion of Abstinence

The Global Gag Rule prohibited NGOs from participating in public education campaigns about reproductive choices (Jones, 2004). Abstinence based programs were used in place of education programs that gave women information about all available contraceptive choices. The reasoning used to support this policy prescription was based on the view that contraception supports promotion of promiscuity and weakens male-dominated family structure (Crane & Dusenberry, 2004). Abstinence programs, however, provide no information about alternative safe sexual practices, and are fatal for women who already have limited rights (Crossette, 2004/05). There is no supporting evidence that abstinence programs achieve their goals. In addition, they slow the fight against HIV transmission because the banned education programs provided all of the information to women and men about safe sex options.

Increases Illegal Abortions

While the goal of the Global Gag Rule is to decrease the number of abortions, experts argue that the number of illegal abortions has actually increased. Since family planning clinics are not allowed to discuss abortion with women, it reduces the options that women have in their evaluation of their family planning options, increasing the number of unwanted pregnancies. Without the provision of safe abortions from clinics,
those who want an abortion are forced to turn to alternative means. Often these methods are unsanitary and extremely dangerous for the mother. In Uganda, where abortions are illegal, the rate of abortions is twice that of the United States (Cohen, 2006). The disruption of family planning options, including the use of contraceptives, increased unwanted pregnancies and lead to an increase in abortions (Crane & Dusenberry, 2004).

The Role of U.S. International Family Planning Policies in Malawi

The defunding of the UNFPA hurt programs around the world, including Malawi where it is an active organization. For example, a community based program, supported by the UNFPA, trained community workers to distribute contraceptives and make referrals to health clinics (Farkas, 2003). This program and others like these lost financial support as a result of President Bush’s policies. While the USAID condom supply remained consistent, the supply from UNFPA decreased, therefore lowering the country’s overall condom supply from its two largest donors.

Two leading international family planning organizations lost hundreds of millions in funding due to the 2001 reinstatement of the Global Gag Rule. Marie Stopes International supports Banja la Mtsogolo, a local family planning NGO, which has 30 clinics throughout Malawi (Marie Stopes International, 2009). The Family Planning Association of Malawi, supported by International Planned Parenthood Federation, supports half of the doctors who work in Malawi’s four central hospitals.
(International Planned Parenthood Federation, 2009). These international NGOs were two of the hardest hit by the Global Gag Rule. They lost millions for refusing to sign onto the policy. This loss of funding had a global impact on their programs, including those in Malawi. With the loss of hundreds of millions of dollars, the international NGOs had no choice but to cut back on programs and financial support to local NGOs and clinics. The majority of these clinics were then forced to close or drastically reduce the services they were able to offer, even the basic services unrelated to abortion and family planning.

While these programs were losing funds, having an impact on family planning in Malawi, USAID funding for HIV/AIDS continued to increase from 2000 to 2004. USAID programs for HIV/AIDS are broken into three main components: prevention, treatment, and orphan and vulnerable children care. In 2000, Malawi was allocated $6 million; by 2003 it had doubled to $11.5 million (USAID, 2009). Therefore even though NGO clinics and the UNFPA were scaling back services, resources were still going towards HIV/AIDS programs. These facts provide for important analysis of whether or not the increased funding from USAID would fill the void from the diminished capacity of NGOs and the UNFPA, or the gap created in NGO and UNFPA services would be greater than increased funding from USAID could overcome.

The effects of the Global Gag Rule and defunding of UNFPA have great significance for the capacity of clinics and health workers to provide family planning
services in the developing world. This paper hypothesizes that the case for Malawi was no different. Even though USAID funding for HIV/AIDS continued to increase between 2000 and 2004 the harmful effects of the family planning policies into the HIV/AIDS sector is predictably large enough to override potential benefits. In addition, the promotion of abstinence education and a decrease in the supply of condoms is predicted to decrease knowledge about their potential benefit in the transmission of AIDS. Moreover, the probability of condom use likely decreased between 2000 and 2004.
Chapter 3: Literature Review

This literature review will document what is known about the relationship between condom use and HIV/AIDS prevalence from epidemiological and economic studies. It is divided into four sections dealing with, perceived risk of sexual behavior, HIV knowledge and educational attainment, cultural barriers, and demographics, and their respective association with condom use.

Perceived Risk of Sexual Behavior

In 2002, Population Services International (PSI) undertook a study to determine the reasons behind non-condom use in Sub-Saharan Africa. They found that the perceived risk of infection was a major determining factor in whether or not couples used a condom. They also concluded that perceived risk was related to the degree of trust between partners and the level of HIV/AIDS knowledge a person has. These results showed that correctly understanding how one can contract the disease plays a part in sexual behavior (Agha, Kusanthan, Longfield, Klein, & Berman, 2002).

The 2002 PSI study determined that trusting a partner was the biggest reason cited for non-condom use. Data were gathered by a survey in which individuals were asked about their sexual behavior and safe-sex practices. Regular partners were less likely to use condoms, but there was an increase in condom use reported by those who had multiple partners (Agha, Kusanthan, Longfield, Klein, & Berman, 2002).

Anderson et al. (2003) arrived at the same conclusion when studying preventive
behavior in the United States; the rate of condom use was higher outside of regular relationships.

An evaluation of sexual behavior in Tanzania from 1994-2000, found that HIV prevalence was continuing to increase even with an increase in the knowledge about AIDS. While there was a slight increase in condom use among a section of the population, overall the increase was not as marked as practitioners had hoped. Individuals who felt that they were not at risk of contracting the disease did not change their sexual behavior (Mwaluko, Urassa, Isingo, Zaba, & Boerma, 2003).

Increasingly AIDS experts are arguing that transmission rates are higher among long-term concurrent sexual partners. Trust between partners is there because of the length of the relationship. Each partner may, however, be involved in a number of long-term relationships, which causes HIV to spread at high rates. What makes these relationships different than having a high number of partners is their concurrent nature. People may be having sexual relations with a few different people at the same time for an extended period of time. If one is to become infected he or she is likely to pass it on to all of his or her partners in a short time (Epstein, 2007). Helen Epstein (2007) calls this the “superhighway” for HIV transmission. She explains that the network created from concurrent long-term relationships is extremely dangerous and the reason why the pandemic is spreading at such a high-rate in Africa. Epstein writes, “because so much HIV transmission in Africa occurs in long-term relationships in which there is a degree
of intimacy and trust, condoms are seldom used, and this makes the pandemic even more difficult to control” (p.60).

If concurrent long-term relationships are a key aspect behind the high rate of HIV transmission in Africa it raises questions about how to create public health programs to target this challenge. This has important implications for this study in determining the association between condom use and individual characteristics.

**HIV Knowledge and Educational Attainment**

In 2006, the World Food Program (2006) released a report evaluating the impact of education levels on HIV/AIDS rates. The study found that the level of knowledge of AIDS was not a predictor of condom use, but educational attainment of individuals was significantly associated with increased condom use (World Food Programme, 2006). This finding supported conclusions from Legarde *et al.* (2001) on relationship between educational attainment and condom use in four cities in Sub-Saharan Africa. The researchers in the study found that educational attainment was a key determinant of condom use.

HIV/AIDS can be a complex issue to understand without a basic education. While informational campaigns target the general population the depth of understanding that may lead to behavior change is found more often with those who have higher levels of education. The survey taken by the National Statistics Office [Malawi] (2000 and 2004) reported that as the level of educational attainment rose, so did the likelihood that an individual used a condom. If this is indeed true it will be
important in evaluating how to best develop education programs that reach the entire population.

Again, Damien de Walque’s (2006) analysis of Ugandans responsiveness to an HIV/AIDS information public health campaign showed that the effectiveness of the campaign through changes in sexual behavior towards safe-sexual encounters was associated with educational attainment. The author referenced two theories on the correlation between education and health. Firstly, educated individuals have more investment in their future and therefore have a stronger incentive to invest in health. Secondly, education helps individuals to better understand health information and adapt accordingly. Table 2, drawn from the 2004 MDHS, shows that as women’s level of wealth and education increased they adapted healthier lifestyle practices. De Walque (2006) also concluded that those in his study who were more educated were more likely to change their behavior after they received information on HIV/AIDS. The table shows that among Malawian women in 2004 there was a positive relationship between wealth and modern contraceptive use and well being.
Table 2: Percentage of women age 15-49 by household wealth and key indicators of health and well-being, Malawi 2004

<table>
<thead>
<tr>
<th>Wealth Index‡</th>
<th>Percentage</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Secondary or higher education</td>
<td>Institutional delivery*</td>
<td>Modern contraceptive use**</td>
<td>BMI≥25.0 kg/m***</td>
</tr>
<tr>
<td>National Average</td>
<td>16</td>
<td>57</td>
<td>28</td>
<td>14</td>
</tr>
<tr>
<td>Lowest</td>
<td>4</td>
<td>47</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>Second</td>
<td>5</td>
<td>47</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>Middle</td>
<td>5</td>
<td>52</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>Fourth</td>
<td>14</td>
<td>64</td>
<td>31</td>
<td>14</td>
</tr>
<tr>
<td>Highest</td>
<td>44</td>
<td>85</td>
<td>38</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: Malawi Demographic and Health Survey 2004

‡ Wealth index is used as a proxy for economic status. It is a tool created by aggregating certain household assets, such as the type of floor, and roof of the home. It was created by Deon Filmer and Lant Pritchett (1998), both well-respected economists at the World Bank, and has been used in countless economic reports covering a variety of topics. The wealth index is supported as an acceptable indicator of socioeconomic status, especially for the richest and poorest quintiles (Mishra et al., 2007).

*Institutional delivery is defined as giving birth in a clinic or hospital.

**Modern contraceptive use includes the use of birth control pills or condoms.

***Body Mass Index (BMI) is women’s weight in kilograms divided by her height in meters squared. BMI is a useful tool to estimate a healthy body weight based on one’s height. A normal healthy BMI is between 18.5 and 25. BMIs greater than 25 can be considered overweight. BMIs less than 17 are considered malnourished.

One theory shared by epidemiological and economic studies with regard to trends in condom use is that educated populations are more likely to respond to new information through behavioral changes, such as increased condom use. The studies cited here showed that HIV/AIDS knowledge played a role in condom use, but it was not necessarily the only factor driving demand. This study expands on this relationship.
further by modeling other individual characteristics that create a demand for condoms. If AIDS knowledge alone is not sufficient to encourage people to use condoms, what other factors are related? It is these relationships this paper seeks to understand.

**Cultural Barriers**

One cultural barrier to condom use is women’s position in society constrains their ability to demand safe-sexual practices from their partners. In Malawi women are often subordinate to men both socially and economically. They are expected to have children and work in the home or field. They have little negotiating power in their relationships and can be beaten for not obeying their husband’s wishes.

Mishra *et al.* (2007) concluded that women’s financial dependence on men makes it difficult for them to demand that condoms be used. Women who depend on men for economic support lose power in their sexual negotiations. Women who are economically independent are more likely to ask a man to wear a condom (Agha, Kusanthan, Longfield, Klein, & Berman, 2002). Women in Malawi face economic, social, legal, and cultural disadvantages that put them at higher risk for contracting HIV. De Walque (2006) concluded in his HIV/AIDS study in Uganda that women also have a greater risk of HIV infection because they are biologically more vulnerable to the disease.

Another cultural barrier in Malawi to condom use was associated with having multiple sexual partners as well as being perceived as unromantic or displaying a lack of romantic involvement between members of a couple (Agha, Kusanthan, Longfield,
Moreover, if a woman asks a man to wear a condom it suggests that he or she has been unfaithful; a socially unacceptable suggestion regardless of potential truth (United Nations Population Fund, 2002). Couples will not use condoms because it is seen as a sign of being promiscuous. Whether or not one has multiple partners it does not change this concern with maintaining the appearance of faithfulness.

Table 3 reemphasizes that, although people were aware of the benefit that condoms provided in preventing HIV transmission, there was still a low level of condom use. For example, in 2000 only 15 percent of males who knew that HIV could be reduced by using a condom did so during their last intercourse. In 2004, 95 percent of women did not use a condom, even though they knew condoms were a tool for preventing HIV transmission. This disconnect between knowledge and condom use could be a function of gender roles or stigmatization of condom use, or both.

**Table 3: Number of respondents who used a condom who have knowledge of AIDS prevention with condom use**

<table>
<thead>
<tr>
<th>Used a condom at last intercourse</th>
<th>Male 2000</th>
<th>Male 2004</th>
<th>Female 2000</th>
<th>Female 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>496</td>
<td>1,521</td>
<td>463</td>
<td>1,653</td>
</tr>
<tr>
<td>Yes</td>
<td>73</td>
<td>283</td>
<td>47</td>
<td>318</td>
</tr>
<tr>
<td>Total</td>
<td>569</td>
<td>1,804</td>
<td>510</td>
<td>1,971</td>
</tr>
</tbody>
</table>

*Data Source: Malawi Demographic and Health Survey 2000 and 2004*
Demographics

In evaluating condom uses several studies found association varied substantially by socio-demographic factors, such as age, region, and marital status (Lagarde *et al.* 2001; Mishra *et al.*, 2007). For example, older, urban, and married persons were more likely to use condoms.

Research studies on the pandemic found trends in the prevalence of HIV based on region—urban versus rural. Mwaluko’s (2003) Tanzania study supported this view, concluding that there was substantial evidence supporting a higher prevalence of HIV in urban areas. While urban life has been determined to be a risk factor in transmission of HIV, the 2005-2009 Malawi National HIV/AIDS Action Framework discusses the problem of behavioral change due to cultural values and traditions that it cites have thrived in poor and rural areas. As discussed in the introduction, HIV initially took hold of populations in urban areas. Throughout the years there has been a shift to more rural areas reporting higher prevalence rates. The pandemic is now a concern throughout the country (National AIDS Commission, 2007).

This research paper will fill a gap in the literature on Malawi to provide current information that can help guide public health and education policies by evaluating which groups have the greatest need for targeted interventions. There is little empirical analysis on the HIV/AIDS epidemic in Malawi. This paper will contribute to the field by providing information to the Government of Malawi in order to increase its
understanding of the pandemic in the country. As one of the poorest countries in the
world, it is critical that Malawi carefully evaluates its HIV/AIDS programs so that
funding can be used in the most results-oriented and cost-effective manner. Analyses
of characteristics associated with condom use are necessary to achieve these goals.

A particular feature of this study will be to examine the impact of the Global
Gag Rule on condom use in Malawi. This will be done with series of interaction terms
which will allow for an examination of condom use before and after the policy went
into effect.
Chapter 4: Hypothesis, Model, Data Source, and Methodology

This study will test the following hypothesis;

Hypothesis
Hypothesis (1):
Condom use and AIDS knowledge will have a positive association in Malawi.

AIDS knowledge is a variable that represents a respondent’s knowledge of the AIDS epidemic and that condom use can help prevent transmission of AIDS. It is reasonable to predict that there will be a positive relationship between AIDS knowledge and condom use.

Hypothesis (1) is useful for explaining the association between AIDS knowledge and condom use, but theory leads to the conclusion that this relationship may be conditional on the Global Gag Rule. To examine this possibility this research paper created a series of interaction terms to test this second hypothesis.

This paper uses a logit regression model to estimate the association between condom use at the last sexual intercourse and the knowledge of the protection that condoms provide against HIV transmission. Three interaction terms were created as proxy variables to evaluate the relationship the Global Gag Rule had with condoms use between 2000 and 2004. The regression results will provide analysis of the association between individuals’ characteristics and condom use, as well as providing insight into the potential significance of the Mexico City Policy in Malawi.
The model is based on a compilation of various studies of condom use, especially the work of Anderson, Santelli, and Mugalla (2003), Jadack, Fresia, Rompalo, and Zenilman (1997), and Oster (2005). The model is:

Model

\[
\log \left( \frac{P}{1-P} \right) = \text{Used condom at last intercourse}
\]

Logit of Odds of condom use at last intercourse

\[
Y_1 \text{ Condom use} = \beta_0 + \beta_1 \text{ AIDS knowledge} + \beta_2 \text{ MDHS survey year} + \beta_3 \text{ AIDS knowledge} \times \text{ MDHS survey year} + \beta_4 \text{ Has ever used a condom} + \beta_5 \text{ Has ever used a condom} \times \text{ MDHS survey year} + \beta_6 \text{ Access to Condoms} + \beta_7 \text{ Access to Condoms} \times \text{ MDHS survey year} + \beta_8 \text{ Female} + \beta_9 \text{ Highest education level attained} + \beta_{10} \text{ Urban} + \beta_{11} \text{ Age} + \beta_{12} \text{ Number of unions} + \beta_{13} \text{ Marital status} + \beta_{14} \text{ Sex partners} + \beta_{15} \text{ Been AIDS Tested} + \varepsilon
\]

Definition of Variables

Following are general definitions of the variables used in the model:

\[
Y_1 \text{ Condom use (at last intercourse)} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} + \beta_{15} X_{15} + \varepsilon
\]

\(\beta_0 = \text{Y-intercept}\)

\(\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}, \beta_{12}, \beta_{13}, \beta_{14}, \beta_{15} = \text{Coefficients of respective independent variables}\)
$X_1 = \text{AIDS knowledge}$

For respondents that have heard of AIDS: knowing that condom use can prevent the transmission of AIDS vs. Not knowing that condoms can prevent transmission of AIDS

$X_2 = \text{MDHS survey year}$

Year MDHS survey was administered—2000 or 2004

$X_3 = \text{AIDS knowledge} \times \text{MDHS survey year}$

$X_4 = \text{Has ever used a condom}$

Condom history indicator: Has ever used a condom vs. Never used a condom

$X_5 = \text{Has ever used a condom} \times \text{MDHS survey year}$

$X_6 = \text{Access to Condoms}$

Supply indicator: Knows where to get a condom vs. Does not know where to get a condom

$X_7 = \text{Access to Condoms} \times \text{MDHS survey year}$

$X_8 = \text{Female}$

Gender indicator: Female vs. Male

$X_9 = \text{Highest education level attained}$

Education status: Years of education

$X_{10} = \text{Urban}$

Survey region indicator: Urban vs. Rural residence

$X_{11} = \text{Age}$

Age: Current age of respondent

$X_{12} = \text{Number of unions}$

Number of unions: Not in a polygamous union vs. In a polygamous union

$X_{13} = \text{Marital status}$

Marital status indicator: Married/living together vs. Not married/Not living together
\( X_{14} = \text{Sex partners} \)

Sexual Partner Status: One regular sex partner vs. More than one regular sex partner

\( X_{15} = \text{Been AIDS tested} \)

AIDS Test Indicator: Been tested for AIDS vs. Has not been tested for AIDS

**Data Source**

The data are from the 2000 and 2004 Malawi Demographic and Health Survey (MDHS), which are random, nationwide surveys managed by the Malawi National Statistics Office, conducted from July 2000 to November 2000 and September 2004 to January 2005 respectively. They are used by the Government of Malawi and international donor organizations to monitor the health and population situation in Malawi and follow-up on similar surveys in 1992 and 1996. The 2000 sample includes 13,220 women age 15 to 49 and 3,092 men age 15 to 54 years. The 2004 sample includes 11,698 women age 15 to 49 and 3,261 men age 15 to 54 years (National Statistical Office, 2002 and 2005).

Data from the 2000 and 2004 MDHS have potential limitations due to the fact that they are self-reported data, which creates potential for bias. For example, some research shows women under report their sexual activity, while men traditionally over report their sexual behavior (de Walque, 2006). There is likely to be a similar bias in the reporting of condom use, sexual partners, and multiple unions. This bias may potentially be correlated with *AIDS knowledge*. If it is, then certain cohorts are more likely to know the “right answer” to sexual behavior questions (de Walque, 2006).
One of the challenges with analyzing condom use is that it is difficult to test actual use of condoms. The number of condoms distributed does not necessarily reflect the actual number of condoms used. However, some observers conclude that current studies of condom use have produced fairly accurate results. The Population Center cites studies which report high condom use among casual partners in developing countries (Hearst & Chen, 2004). Weller and Davis (2003) found that while condom use may be associated with other factors, creating the potential for estimates to be jointly determined thereby creating a bias; respondents’ reporting of condom use was often reliable therefore mitigating any potential bias.

Methodology

Exhibit 1 contains more detailed information on the variables in the model. It includes the predicted relationship that each variable will have with the likelihood of condom use. The predictions are based on theory and research, listed in the ‘Rational/Previous Studies’ column.
### Exhibit 1: Description of Variables

<table>
<thead>
<tr>
<th>β₁</th>
<th>Description of Variable Name</th>
<th>Definition</th>
<th>Predicted Relationship</th>
<th>Rationale/Previous Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>β₁</td>
<td>AIDS knowledge</td>
<td>Whether the respondent has ever heard of AIDS and knows that condoms help prevent transmission of AIDS, where 1 = yes, 0 = no</td>
<td>Positive</td>
<td>Agha, Kusanthan, Longfield, Klein, &amp; Berman, 2002; Mwaluko, Urassa, Isingo, Zaba, &amp; Boerma, 2003;</td>
</tr>
<tr>
<td>β₂</td>
<td>MDHS survey year</td>
<td>Year of MDHS survey data, dummy variable where 1 = 2004, 0 = 2000</td>
<td>Positive</td>
<td>Oster, 2005</td>
</tr>
<tr>
<td>β₃</td>
<td>AIDS knowledge*Year</td>
<td>Interaction term: Whether the respondent has ever heard of AIDS and knows that condoms help prevent transmission of AIDS interacted with year.</td>
<td>Negative</td>
<td>Crane &amp; Dusenberry, 2004; Jones, 2004; Crossette, 2004/05; Center for Reproductive Rights, 2000</td>
</tr>
<tr>
<td>β₄</td>
<td>Has ever used a condom</td>
<td>Whether or not the respondent has ever used a condom, where 1 = yes, 0 = no</td>
<td>Positive</td>
<td>National AIDS Commission, 2007; Chin, 2007; Epstein, 2007; Mnyika, 1997</td>
</tr>
<tr>
<td>β₅</td>
<td>Has ever used a condom* Year</td>
<td>Interaction term: Whether or not the respondent has ever used a condom interacted with year.</td>
<td>Negative</td>
<td>Population Action International; Crossette, 2004/05; Population Action International, 2005</td>
</tr>
<tr>
<td>β₆</td>
<td>Access to condoms</td>
<td>Whether or not the respondent knows where to get a condom, where 1 = yes, 0 = no</td>
<td>Positive</td>
<td>Center for Reproductive Rights, 2000; Farkas, 2003; Hearst &amp; Chen, 2004; Population Action International, 2008; Population Action International, 2007</td>
</tr>
<tr>
<td>( \beta_7 )</td>
<td>Access to condoms*Year</td>
<td>Interaction Term. Whether or not the respondent knows where to get a condom interacted with year.</td>
<td>Negative</td>
<td>Farkas, 2003; Center for Reproductive Rights, 2000; Girard, 2004</td>
</tr>
<tr>
<td>( \beta_8 )</td>
<td>Female</td>
<td>Dummy variable, where 1 = female, 0 = male</td>
<td>Negative</td>
<td>Agha, Kusanthan, Longfield, Klein, &amp; Berman, 2002; Crampin et al., 2003; United Nations Population Fund; USAID, 2008; Oster, 2005; Mishra et al., 2007</td>
</tr>
<tr>
<td>( \beta_9 )</td>
<td>Highest education level attained</td>
<td>Highest education level attained, continuous variable. Constructed from Malawi's educational system.</td>
<td>Positive</td>
<td>Crampin et al., 2003; World Food Programme, 2006; Lagarde et al., 2001; National Statistical Office [Malawi] and ORC Macro, 2005</td>
</tr>
<tr>
<td>( \beta_{10} )</td>
<td>Urban</td>
<td>Region where the respondent was interviewed, where 1 = urban, 0 = rural</td>
<td>Positive</td>
<td>Mwaluko, Urassa, Isingo, Zaba, &amp; Boerma, 2003; National AIDS Commission, 2007</td>
</tr>
<tr>
<td>( \beta_{11} )</td>
<td>Age</td>
<td>Current age of respondent</td>
<td>Negative</td>
<td>Crampin et al., 2003; Lagarde et al., 2001; Oster, 2005</td>
</tr>
<tr>
<td>( \beta_{12} )</td>
<td>Number of unions</td>
<td>Whether the respondent is in a polygamous union, where 1 = yes, 0 = no</td>
<td>Negative</td>
<td>Epstein, 2007; Chin, 2007; Agha, Kusanthan, Longfield, Klein, &amp; Berman, 2002; de Walque, 2004</td>
</tr>
</tbody>
</table>
| \( \beta_{13} \) | Marital status | Current marital status of the respondent, where 1 = Married or Living together, 0 = not married or not living together | Negative | Agha, Kusanthan, Longfield, Klein, & Berman, 2002; Crampin et al., 2003; Mwaluko, Urassa, Isingo, Zaba, & Boerma, 2003; Anderson, Santelli, &
| $\beta_{14}$ | Sex partners | Number of sex partners in the last year, including spouse; continuous variable from 1 to 23 | Positive | Agha, Kusanthan, Longfield, Klein, & Berman, 2002; Mwaluko, Urassa, Isingo, Zaba, & Boerma, 2003; Anderson, Santelli, & Mugalla, 2003; Oster, 2005 |
| $\beta_{15}$ | Been AIDS tested | Whether or not the respondent has been tested for HIV/AIDS, where 1 = yes, 0 = no | Positive | Epstein, 2007; WHO, UNAIDS, & UNFPA, 2004 |
Chapter 5: Analysis

Table 4 shows the incidence of condom use based on respondents’ AIDS knowledge, specifically knowing that the chance of HIV transmission is reduced by using a condom. Despite knowledge of the protection afforded by condoms with regards to HIV seven of ten individuals did not use one. The regression results confirm that knowledge about AIDS or the protection against transmission that condoms provide was not a strong driver of condom use.

Table 4: Incidence of condom usage when respondent knows that condoms can prevent transmission of AIDS, Malawi 2000 and 2004

<table>
<thead>
<tr>
<th>Last Intercourse Used Condom</th>
<th>Number</th>
<th>Knows that the chance of AIDS transmission is reduced by using a condom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1,649</td>
<td>No (%)</td>
</tr>
<tr>
<td>No</td>
<td>20,992</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>22,641</td>
<td>29</td>
</tr>
</tbody>
</table>

Data Source: Malawi Demographic and Health Survey 2000 and 2004

The regression results reported in Table 5 test the hypothesis that there is a positive association between condom use and knowledge of condom effectiveness against AIDS. The results, however, are not statistically significant and therefore it cannot be stated with confidence that the result is different from zero. This finding is similar to the findings of Mwaluko et al. (2003) in their study of sexual behavior in Tanzania from 1994 to 2000. Their study also showed no marked increase in condom
use even with an increase in knowledge about AIDS. They determined this was related to how much one trusts his or her partner. Those who trusted their partner were unlikely to change their sexual behavior. In addition, it may be a result of the stigmatization associated with condoms.

Statistically Significant Variables

Table 5 shows the results of my regression analysis. Among the important predictors of individual characteristics for condom use, gender, educational attainment, age, and marital status were all statistically significant. Statistically significant variables specifically related to AIDS knowledge and condoms are those where the respondent: has been tested for AIDS, has access to condoms, and has ever used a condom. The interaction term between year and if the respondent has ever used a condom was also statistically significant. All of these variables were significant at the 99 percent confidence level. This model does not suffer from multicollinearity. (See Appendix I for details).
Table 5: Coefficient estimates for logit regression results, Malawi 2000 and 2004

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficients</th>
<th>Z-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIDS and condom knowledge</td>
<td>-0.03</td>
<td>-0.23</td>
</tr>
<tr>
<td>Year</td>
<td>0.27</td>
<td>1.10</td>
</tr>
<tr>
<td>Year*AIDS and condom knowledge</td>
<td>0.21</td>
<td>1.36</td>
</tr>
<tr>
<td>Has ever used a condom</td>
<td>3.09***</td>
<td>29.28</td>
</tr>
<tr>
<td>Year*Has ever used a condom</td>
<td>-0.40***</td>
<td>-2.80</td>
</tr>
<tr>
<td>Can get a condom</td>
<td>0.45***</td>
<td>2.68</td>
</tr>
<tr>
<td>Year*Can get a condom</td>
<td>-0.15</td>
<td>-0.66</td>
</tr>
<tr>
<td>Female</td>
<td>0.20***</td>
<td>2.72</td>
</tr>
<tr>
<td>Educational Attainment</td>
<td>0.28***</td>
<td>4.92</td>
</tr>
<tr>
<td>Urban</td>
<td>0.05</td>
<td>0.67</td>
</tr>
<tr>
<td>Age</td>
<td>-0.04***</td>
<td>-7.44</td>
</tr>
<tr>
<td>Multiple Unions</td>
<td>-0.06</td>
<td>-0.45</td>
</tr>
<tr>
<td>Marital Status</td>
<td>-1.95***</td>
<td>-26.00</td>
</tr>
<tr>
<td>Number of Sexual Partners in last 12 months</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Been AIDS Tested</td>
<td>0.39***</td>
<td>4.92</td>
</tr>
</tbody>
</table>

N=18,477

Wald chi-square (df) = 4051.09 (15)
Chi-square > .001
Pseudo R² = .3792

Data Source: Malawi Demographic and Health Survey 2000 and 2004

*** p<.01, statistically significant at the 99 percent confidence level

Demographic Variables

Previous studies (Oster, 2005; Agha, Kusanthan, Longfield, Klein, & Berman, 2002; Crampin et al., 2003) suggested that women were less likely to use condoms because there are often cultural barriers and they have less bargaining power in relationships. Women are often economically dependent on and culturally subordinate to men, making it difficult or impossible for them to demand that men use condoms.
during sex. Cultural stereotypes of condom use result in implications of infidelity. A woman asking her husband to wear a condom seems to imply that he or she has been having an affair. Also, in Malawi, as in much of Sub-Saharan Africa, women are expected to bear children as part of their duty to their husbands and their role in society. Previous studies suggest that these factors combine to lower a woman’s negotiating power in discussions of condom use.

The logit results from this study, however, are in contrast with the conclusions of earlier studies. The female variable was positively and statistically significantly related to condom use. That is, women had a strong positive association with condom use.

This result may be biased resulting from the fact that more women than men participated in the survey. The 2000 MDHS survey sample includes 13,220 women and 3,092 men. The 2004 survey sample includes 11,698 women and 3,261 men (National Statistical Office, 2002 and 2005). The disproportionate number of women may have induced a higher likelihood of finding some that used condoms. Also, the positive result may be related to women’s desire to limit family size and the risk of HIV/AIDS.

Educational attainment was also highly statistically significant and positively related to condom use. Previous studies showed that higher levels of educational attainment were associated with increased condom use (Crampin et al., 2003; World
Food Programme, 2006; Lagarde et al., 2001; National Statistical Office [Malawi] and ORC Macro, 2005). It is believed to increase one’s ability to provide the necessary attention to personal health. Those with higher education often have greater access to health care services and greater resources to spend on health care. Some theories argue that education also raises the opportunity cost of an individual not maintaining high levels of personal health. In addition, people with higher levels of education have been shown to respond faster to public health campaigns through behavior change (de Walque, Nakiyangi-Miro, Busingye, & Whitworth, 2005). This study lends support to these conclusions.

The results for educational attainment are not only important for policy purposes, but also for tracking the path of the pandemic. When HIV/AIDS was first diagnosed in sub-Saharan Africa, it was the wealthiest and most educated cohorts that were contracting the virus the fastest. They were in more mobile groups and, therefore, quickly became a high-risk group. The results of this study support the view that the pandemic has changed paths, now affecting those from poorer and more uneducated communities at higher rates. This creates challenges for the targeting of public policy programs.

Age was another highly significant variable, with a Z-score of -7.48. The negative relationship between age and likelihood of condom use was in-line with previous studies (Crampin et al., 2003; Lagarde et al., 2001; Oster, 2005). With each
additional year of age, a person becomes less likely to use a condom. A lot of emphasis is placed on educating youth about safe sex practices and family planning. Targeting youth is a critical aspect of public health campaigns, but this result implies that there is still a need to address the HIV pandemic in the adult population as well.

Marital status had a powerfully negative and statistically significant relation to condom use. This result is supported by the theory that married couples are less likely to use a condom, and is consistent with the Malawian cultural belief that it is inappropriate to ask a spouse to wear a condom (Agha, Kusanthan, Longfield, Klein, & Berman, 2002; Jadack, Fresia, Rompalo, & Zenilman, 1997).

AIDS and Condom Variables

If a respondent has been AIDS tested, has access to condoms, and has ever used a condom, there was a positive and statistically significant association with condom use. These variables provide for analysis of a respondent’s understanding of condom use.

The variable has ever used a condom had a strong positive and statistically significant association with condom use. This result supports earlier investigations of condom use (Population Action International; Crossette, 2004/05; Population Action International, 2005). Once an individual has used a condom he or she is likely to use one again. This finding is important to consider when developing policies and programs that promote condom use. If those who have used condoms are more likely
to use them in the future, there is a potential for success if policies can provide persuasive incentives to get people to use a condom once; and educate them about the benefits of continuous use.

*Has access to condoms* was also related positively and significantly to condom use. Access is a critical component of demand. One barrier to health care in Malawi is the lack of health care personnel. Creative solutions must be undertaken to ensure that condoms are available widely and not solely at clinics.

There was also a strongly positive and significant relations between *has been AIDS tested* and condom use; this was expected. Those who are willing to be tested for AIDS are likely to be more educated about the virus and potential ways to curb its transmission. This shows that while for the general population knowledge about condoms’ potential to prevent HIV transmission does not have a statistically significant association with condom use, actually having been tested for HIV/AIDS does. It is reasonable to assume that those who have been tested are educated about HIV/AIDS. Further research uncovering why people choose to get tested for HIV/AIDS might help in developing more effective efforts to promote condom use.

**Statistically Insignificant Variables**

Urban residence, having multiple unions, and the number of sexual partners in the past year were all variables whose relations to condom use were not statistically significant. The insignificance of *urban* shows again the changing nature of the
pandemic; the infectious disease is a country-wide concern, not solely one in rural or urban areas. When AIDS was first discovered it was believed that those in urban areas were at highest risk. The reasoning behind this thinking was that there are more people in urban areas, more mobility, and therefore more opportunities for contracting HIV. However, the present study supports the conclusion that there is no statistically significant difference between urban and rural likelihood of condom use. Public health programs must target the entire country, not small pockets.

Recent literature suggests that concurrent long-term relationships are chiefly responsible for the high rates of transmission in Africa (Epstein, 2007). So, the insignificance of multiple unions and number of sex partners variables in the present study was surprising. This may result be an affect of the self-reporting survey. As previously discussed, de Walque (2006) found that there is potential for people to know the “right answer” to questions when discussing their sexual history. Further empirical research should be done on long-term concurrent relationships. If those in multiple unions are less likely to use condoms, increased challenges arise in how to best target behavior change. If future empirical studies find statistical significance for long-term concurrent relationships, it could potentially change the way health programs are designed.
Interaction Variables

The interaction terms in my model provide for analysis of the association between the defunding of the UNFPA and Global Gag Rule, which cut U.S. family planning funds to countries and NGOs, and condom use in Malawi from 2000 to 2004. The variable year was used as a proxy in the interactions to distinguish between circumstances before the policy was in place (2000) and after the policy’s implementation (2004). The variable year was surprisingly positive, but not statistically significant when evaluated alone.

Only the interaction between year and has ever used a condom was statistically significant. Its negative and statistically significant relationship supports the conclusion that there was a strong relationship between the probability of consistent condom use overtime, providing support for the research citing the negative effects of the Global Gag Rule. The negative sign could be attributed to an increase in the number or size of programs focusing on abstinence, as opposed to condoms.

Research suggested that the Global Gag Rule’s cut in funding to family planning organizations and the defunding of the UNFPA had detrimental effects on HIV/AIDS programs and services in developing countries. Malawi was not a nation directly targeted by the U.S. policy because its abortion policy is in-line with the requirements of the Global Gag Rule. This perhaps partly explains why the other two interactions were not significant. However, two of the primary non-governmental
organizations providing family planning services were directly targeted and lost millions of dollars in U.S. funding. This loss in funding affected family planning clinics on a variety of levels.

The original expectation was that all of the interactions would have negative signs. However, the positive sign of the interaction between AIDS knowledge and year may imply that, while there were cuts in family planning programs, AIDS education was not as affected as initially hypothesized. Potentially due to the increase in funding from USAID, the result is not statistically significant and therefore could not be distinguished from zero.

Even though only one of the predicted interactions was statistically significant it represents a negative change over the four-year period. This analysis returns to the previous question raised as to whether increased funding from USAID earmarked for AIDS programs would mitigate the negative effects on NGO and UNFPA services. The negative and significant relationship shows the negative unintended consequences of the policies did have an association with condom use. If this were the case for Malawi, it is reasonable to believe that countries which were more heavily targeted and affected by the Mexico City Policy fared much worse. Further empirical research should be done on the effect of the policy throughout the world, especially African nations most impacted due to their country’s national abortion policy.
Predicted Probabilities

Coefficients from logit regressions are not useful for translating directly into expected results. Table 6a and Table 6b show the predicted probability of condom use for respondents with the characteristics identified by the variable. Table 6a is for women and Table 6b for men. Both tables are configured for respondents who know that condoms can prevent transmission of HIV (*AIDS knowledge*), have used a condom once before (*has ever used a condom*), and know where they can get a condom (*access to condoms*). For these variables only if the respondent has used a condom before and knows where to get a condom have a positive and statistically significant effect on the likelihood of future condoms use.

The predicted probabilities of condom use are higher for every variable and both genders in year 2000. This result further supports the theory that there were negative effects outside the sphere of the policy between 2000 and 2004. The highest predictors for condom use were respondents with higher education, those who were not married, and those who had been tested for AIDS.
Table 6a. Predicted probabilities for women using a condom during last intercourse, Malawi 2000 and 2004

<table>
<thead>
<tr>
<th>Variable</th>
<th>2000</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probability</td>
<td>Observations</td>
</tr>
<tr>
<td></td>
<td>(n = 699)</td>
<td></td>
</tr>
<tr>
<td>Ed Attainment*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Ed</td>
<td>19.7%</td>
<td>74</td>
</tr>
<tr>
<td>Primary</td>
<td>24.6%</td>
<td>439</td>
</tr>
<tr>
<td>Secondary</td>
<td>30.2%</td>
<td>180</td>
</tr>
<tr>
<td>Higher</td>
<td>36.5%</td>
<td>6</td>
</tr>
<tr>
<td>Marital Status*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19.3%</td>
<td>495</td>
</tr>
<tr>
<td>No</td>
<td>62.4%</td>
<td>204</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>25.3%</td>
<td>247</td>
</tr>
<tr>
<td>No</td>
<td>24.3%</td>
<td>452</td>
</tr>
<tr>
<td>Multiple Unions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>23.6%</td>
<td>69</td>
</tr>
<tr>
<td>No</td>
<td>24.7%</td>
<td>630</td>
</tr>
<tr>
<td>Been AIDS tested*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>31.1%</td>
<td>108</td>
</tr>
<tr>
<td>No</td>
<td>23.4%</td>
<td>591</td>
</tr>
</tbody>
</table>

Data Source: Malawi Demographic and Health Survey 2000 and 2004
Note: Used Model with x = mean from Appendix II for age and number of sexual partners
*Statistically Significant Variables at the 99% confidence level
Table 6b. Predicted probabilities for men using a condom during last intercourse, Malawi 2000 and 2004

<table>
<thead>
<tr>
<th>Variable</th>
<th>2000</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probability</td>
<td>Observations (n = 752)</td>
</tr>
<tr>
<td>Ed Attainment*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Ed</td>
<td>16.7%</td>
<td>41</td>
</tr>
<tr>
<td>Primary</td>
<td>21.0%</td>
<td>455</td>
</tr>
<tr>
<td>Secondary</td>
<td>26.1%</td>
<td>250</td>
</tr>
<tr>
<td>Higher</td>
<td>31.9%</td>
<td>6</td>
</tr>
<tr>
<td>Marital Status*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16.3%</td>
<td>482</td>
</tr>
<tr>
<td>No</td>
<td>57.6%</td>
<td>270</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21.7%</td>
<td>212</td>
</tr>
<tr>
<td>No</td>
<td>20.8%</td>
<td>540</td>
</tr>
<tr>
<td>Multiple Unions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20.1%</td>
<td>37</td>
</tr>
<tr>
<td>No</td>
<td>21.1%</td>
<td>715</td>
</tr>
<tr>
<td>Been AIDS tested*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>26.9%</td>
<td>181</td>
</tr>
<tr>
<td>No</td>
<td>20.0%</td>
<td>571</td>
</tr>
</tbody>
</table>

Data Source: Malawi Demographic and Health Survey 2000 and 2004

Note: Used Model with x = mean from Appendix II for age and number of sexual partners

*Statistically Significant Variables at the 99% confidence level
Chapter 6: Policy Recommendations

There is no single solution that can end the AIDS pandemic. This research will help the government of Malawi improve the quality and prevention efforts of their HIV/AIDS programming. The Government of Malawi operates under financial and personnel constraints in its provision of health services. One step to the development of cost-effective health programs is uncovering characteristics of individuals to improve targeting. Education programs, condom promotion, and ARTs should be used in combination to achieve effective results (Population Action International, 2008).

This study helps to provide knowledge of characteristics of those who use condoms. Characteristics that were statistically significant predictors of condom use were: access to condoms, has ever used a condom, and whether or not an individual has been AIDS tested. These characteristics can be a guide for developing public health programs, especially in countries like Malawi, where health care resources are extremely limited.

Increase HIV/AIDS Education Programming

One of the challenges is that both high-risk groups and the general population need to receive information about HIV/AIDS prevention in a format accessible and understandable to all. There must be an increased effort to educate the entire population about the risks of HIV/AIDS and other sexually transmitted infections.
Condoms are a critical part of this program, but information about condoms must also be accompanied by information about safe sexual practices. None of these approaches are mutually exclusive and none should not be presented alone as the answer to slowing the spread of HIV (WHO, UNAIDS, & UNFPA, 2004).

Destigmatize Condoms through Education

Condoms are often stigmatized in society in a variety of ways. People who use condoms are often seen as promiscuous. It is also difficult for women to ask men to use condoms because of the underlying implications that he or she may be having an affair. Creating programs that target cultural bias and stereotypes will provide the most effect results. For example, promoting condoms as a sign of trust and love in a relationship (Population Action International, 2007). Thailand, Cambodia, and Uganda both saw large increases in condom use through programs that destigmatized condoms (WHO, UNAIDS, & UNFPA, 2004). Designing programs with understanding of the fears and cultural barriers to condom use is essential to halting the transmission of HIV (Population Action International, 2007). Social marketing of condoms has proven to be a key tool to increasing condom use (Miller, Sloan, Weiss, & Pobiak, 2003).

Condom promotion has been most successful in those countries that promote condom use for pleasure and safe-sex practices, not focusing only on the fear of disease and death that could come without their use (Philpott, Knerr, & Maher, 2006). Teaching people about condoms and the benefits of their use could help to increase
their use throughout the population. Further research is necessary to clearly identify all of the cultural biased and stigmas at work in Malawi.

Another important program element will be promoting condoms to married couples (Population Action International, 2008). This research paper shows a strong negative association between condom use and marital status. Couples without knowledge of their HIV status are at risk for transmission between partners. Educating about condoms as a tool of love and trust is likely to raise acceptance among married couples, especially those who should be using condoms on a consistent basis.

**Expand Access to Condoms**

One challenge with expanding access to condoms is the increased funding required. This has implications for condom programming, because a government cannot talk about condom use if they are unable to provide condoms to the population. Condoms need to be free or subsidized to be accessible to all (WHO, UNAIDS, & UNFPA, 2004). The Government of Malawi should continue to work with donor governments and NGOs to ensure the supply of condoms meets the demand. One option would be working with The Global Fund to Fight AIDS, Tuberculosis, and Malaria, and adding an increase supply of condoms to the next grant.

Expanding the variety of locations where condoms are available has proven successful in a number of countries. Making condoms available at barber shops or beauty salons and other locations frequented on a regular basis expands the options one
has for finding a condom. Restricting condoms to clinics may increase the difficulty of expanding access. If condoms are available in stores and locations which people frequent in their day-to-day activities they are more likely to take and use them.

Condoms are a cost-effective tool in combating HIV transmission, however funding is a continued barrier to supply (Population Action International, 2007). With funding as a restrictive element it raises ethical questions about how money should be spent. For example, should more money be allocated to prevention or treatment? Considering the limited resources it seems that focusing on prevention may provide a more sustainable long-term mechanism for curbing transmission and reducing the prevalence of the disease. The debate on prevention versus treatment is a continuous one throughout the international public health community. There are no easy answers to this question.

**Expand and Promote HIV Testing**

Those who have been tested for HIV have a strong probability of condom use. The promotion of HIV testing achieves a variety of the policy goals listed above. It includes education about the disease and provides an opportunity to learn about different safe sexual practices. Clinics that provide HIV testing should have condoms readily available to give to their clientele to ensure that people know where they can find condoms.
South Africa launched a successful program in which text messages were sent to all cell phone users encouraging them to get tested for HIV. Some of the texts listed the number for the national AIDS helpline. Calls to the helpline rose from 1,000 to 4,000 after the launch of the program. Messages were broadcast in both English and Zulu (British Broadcasting Company News, 2008). This program provides an example of one type of program the Government of Malawi could institute at low cost in order to raise awareness about AIDS testing.

**Treatment**

One of the debates surrounding donor funding for HIV/AIDS is how much money should be spent on prevention versus treatment. While both are critical, more funds are often used for treatment as opposed to prevention. In 2007, there were three new infections for every one person being treated with ARVs (Population Action International, 2007).

Continued support of ART programs is necessary. Treatment programs per person are decreasing in cost with the introduction of generic drugs and increased competition. The main costs of ART are not the drugs, but paying the health care professionals, providing training in the administration of the drugs, and creating the lab capacity to support the program. Malawi is severely limited in its number of health care professionals. In 2005, there were more Malawian doctors in the city of
Manchester, United Kingdom then in all of Malawi. This void of health care professionals creates a strain on the administration of ARTs (Fleshman, 2005).

Another important factor when considering ARTs is that once they are started the person cannot stop the treatment. The treatment regime is strict and the patient must remain on schedule with the drugs. New mechanisms, such as texting patients to remind them to get treatment, have improved the consistency of patients and therefore the effectiveness of ART. A challenge posed is financial. Putting people on treatment provides the benefit that they become healthy enough to contribute to society and the economy. The constraint is that recipients are on the treatment for the rest of their lives. Putting all those infected with HIV on ART would pose an enormous financial burden that would be difficult for any country in the developing world to support. Therefore, governments must rely on donors to provide financing for the programs. Moreover, questions of sustaining ART for a large segment of the population is complicated by the fact that costs rise each year because of the rising number of AIDS cases and patients receiving ART. This is one reason why prevention programs are critical.

The Government of Malawi must continue to improve salaries and working conditions for new medical staff. Improving the training of medical staff to administer ART will help battle not only the AIDS pandemic, but will likely produce a positive externality improving other health factors. Creating incentive structures for health care
professionals to stay in Malawi or work in rural areas will be critical to fighting AIDS and other health problems.
Chapter 7: Conclusion

The battle against HIV and AIDS is a long-term struggle. There is hope that a vaccine will be discovered, but progress has been slow. Increased competition and the introduction of generic ARVs has decreased the price of treatment per person, but 8,000 people still die globally each day from the virus (Fleshman, 2005). Preventing the spread of the disease is the most cost-effective and currently the most successful mechanism for combating the infectious disease.

The effect of the Mexico City Policy shows the significance that donors, specifically the United States, play in Africa’s fight against HIV/AIDS. Malawi’s abortion policy is in-line with the Global Gag Rule, yet there was still a negative significant effect from the policy. It is reasonable to assume that other nations that were targeted by the Global Gag Rule suffered even more than Malawi, although more empirical research is needed to confirm this assumption. The significance shows the dependence that Malawi has on the international community to help it fight the pandemic. With limited resources and personnel the Government of Malawi needs support and expertise to develop programs targeted at the country’s population that take into consideration any political, economic, or cultural stereotypes and barriers.
Appendix I: Correlation Coefficients, Malawi 2000 and 2004

| last_used_\text{m} | knowsAIDS_\text{m} | year | year_\text{aids} | ever_used_\text{m} | year_\text{ever}_\text{d} | can_get_healthcare | year_\text{condo}_\text{y} | female | ed_attainm | urban | age | multiple_u-n | marital_st-s | no_sex_par-s | been_AIDS_\text{d} | ape | marital_u-n | no_sex-s | been_AIDS_\text{d} |
|-------------------|---------------------|------|-------------------|---------------------|------------------------|-------------------|---------------------|--------|-------------|-------|-----|-------------|-------------|-------------|----------------|-----|-------------|---------|----------------|---------------|
|                   | 1.0000              |      |                   |                     |                        |                   |                     |        |             |       |     |             |             |             |                |     |             |         |               |               |
| knowsAIDS_\text{m} | 0.0435              | 1.0000 |                   |                     |                        |                   |                     |        |             |       |     |             |             |             |                |     |             |         |               |               |
| year              | -0.0092             | -0.0586 | 1.0000            |                     |                        |                   |                     |        |             |       |     |             |             |             |                |     |             |         |               |               |
| year_\text{aids}  | 0.0197              | 0.4393 | 0.7388            | 1.0000              |                        |                   |                     |        |             |       |     |             |             |             |                |     |             |         |               |               |
| ever_used_\text{m} | 0.4339              | 0.0685 | 0.0070            | 0.0520              | 1.0000                |                   |                     |        |             |       |     |             |             |             |                |     |             |         |               |               |
| year_\text{ever}_\text{d} | 0.2544 | 0.0460 | 0.3515            | 0.3224              | 0.6575                | 1.0000            |                     |        |             |       |     |             |             |             |                |     |             |         |               |               |
| can_get_healthcare | 0.0862              | 0.0640 | -0.0407           | -0.0030             | 0.1417                | 0.0821            | 1.0000              |        |             |       |     |             |             |             |                |     |             |         |               |               |
| year_\text{condo}_\text{y} | 0.0257 | -0.0239 | 0.8096            | 0.6202              | 0.0646                | 0.3634            | 0.3883              | 1.0000 |             |       |     |             |             |             |                |     |             |         |               |               |
| female            | -0.1587             | -0.0832 | -0.0209           | -0.0793             | -0.3678              | -0.2651           | -0.1627            | -0.0890 | 1.0000       |       |     |             |             |             |                |     |             |         |               |               |
| ed_attainm        | 0.1715              | 0.0346 | 0.0239            | 0.0441              | 0.2257                | 0.1590            | 0.0720              | 0.0527  | -0.1670     | 1.0000 |     |             |             |             |                |     |             |         |               |               |
| urban              | 0.0748              | -0.0011 | -0.1336           | -0.0996             | 0.0741                | -0.0097           | 0.0115              | -0.0975 | 0.0047      | 0.2772 | 1.0000 |             |             |             |                |     |             |         |               |               |
| age               | -0.1656             | -0.0348 | 0.0182            | -0.0021             | -0.0956              | -0.0557           | -0.0335            | -0.0274 | -0.1243     | -0.1978 | -0.0491 |             |             |             |                |     |             |         |               |               |
| multiple_u-n      | -0.0670             | -0.0154 | 0.0089            | 0.0062              | -0.0442              | -0.0208           | -0.0045            | 0.0086  | 0.0767      | -0.1084 | -0.0935 |             |             |             |                |     |             |         |               |               |
| marital_st-s      | -0.3410             | -0.0394 | 0.0374            | 0.0214              | -0.1592              | -0.0696           | -0.0669            | 0.0000  | 0.1144      | -0.1421 | -0.0615 |             |             |             |                |     |             |         |               |               |
| no_sex_par-s      | 0.0926              | 0.0313 | -0.0249           | -0.0050             | 0.1388                | 0.0643            | 0.0548              | -0.0012 | -0.2032     | 0.0415  | 0.0381 |             |             |             |                |     |             |         |               |               |
| been_AIDS_\text{d} | 0.0790              | 0.0126 | 0.0631            | 0.0588              | 0.0949                | 0.0805            | 0.0348              | 0.0624  | -0.0515     | 0.1559  | 0.0991 |             |             |             |                |     |             |         |               |               |

Source: Malawi Demographic and Health Survey 2000 and 2004

The above correlation coefficients show that there is no multicollinearity in the model.

There is high correlation between interaction terms and individual variables within the interaction, which is to be expected and does not imply multicollinearity.
Appendix II: Linktest, Malawi 2000 and 2004

Logistic regression                               Number of obs   =      18477
LR chi2(2)      =    4070.54
Prob > chi2     =     0.0000
Log likelihood = -3305.8561                       Pseudo R2       =     0.3811
------------------------------------------------------------------------------
last_used_~m |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   _hat       |     .85259   .0384885    22.15   0.000     .7771538    .9280262
   _hatsq     |  -.0447238   .0102932    -4.34   0.000     -.064898   -.0245495
   _cons      |  -.0065166   .0430994    -0.15   0.880    -.0909899    .0779567
------------------------------------------------------------------------------

Source: Malawi Demographic and Health Survey 2000 and 2004

The above linktest verifies whether or not the model is properly specified. Ideally, the `_hat` should be statistically significant, as it is above. And the `_hatsq` should not be statistically significant, which is not the case above. Because the `_hatsq` is not statistically significant there is a possibility that the model is not properly specified. There may be other additional variables that would be statistically significant, but are not included in the model. For example, factors like culture and attitude may be important but measuring them is difficult. As such, they are not included here.
## Appendix III: Logit Models, Malawi 2000 and 2004

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Used a condom at last sexual intercourse</th>
<th>(2) Used a condom at last sexual intercourse</th>
<th>(3) Used a condom at last sexual intercourse</th>
<th>(4) Used a condom at last sexual intercourse</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIDS knowledge</td>
<td>-0.0183</td>
<td>0.0829</td>
<td>0.0727</td>
<td>-0.0252</td>
</tr>
<tr>
<td>(0.110)</td>
<td>(0.0787)</td>
<td>(0.0786)</td>
<td>(0.111)</td>
<td></td>
</tr>
<tr>
<td>MDHS survey year</td>
<td>-0.106</td>
<td>0.305***</td>
<td>0.215</td>
<td>0.273</td>
</tr>
<tr>
<td>(0.139)</td>
<td>(0.117)</td>
<td>(0.209)</td>
<td>(0.248)</td>
<td></td>
</tr>
<tr>
<td>Has ever used a condom</td>
<td>2.902***</td>
<td>3.096***</td>
<td>2.902***</td>
<td>3.094***</td>
</tr>
<tr>
<td>(0.0772)</td>
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<td>0.447***</td>
</tr>
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<td>(0.167)</td>
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<td>0.284***</td>
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<tr>
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<td>0.390***</td>
<td>0.392***</td>
<td>0.391***</td>
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<td>(0.0795)</td>
<td>(0.0794)</td>
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<td>Year*AIDS knowledge</td>
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<td>-0.398***</td>
<td>0.214</td>
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<td>(0.142)</td>
<td>(0.157)</td>
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<tr>
<td>Year*has used a condom</td>
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<td>-0.398***</td>
<td>-0.398***</td>
<td>0.214</td>
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<td>(0.142)</td>
<td>(0.142)</td>
<td>(0.157)</td>
<td></td>
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<tr>
<td>Year*access to condoms</td>
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<td>-2.519***</td>
<td>-2.493***</td>
<td>-2.507***</td>
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<td>Wald chi-square (df)</td>
<td>4042.29 (13)</td>
<td>4048.87 (13)</td>
<td>4041.78</td>
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<td>Chi-square</td>
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<td>&gt; .001</td>
<td>&gt; .001</td>
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<td>Pseudo R²</td>
<td>.3784</td>
<td>.3790</td>
<td>.3784</td>
<td>.3792</td>
</tr>
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</table>

Data Source: Malawi Demographic and Health Survey, 2000 and 2004

Standard errors in parentheses

*** Significant at the 99 percent level
Appendix III provides the logit results for four regressions. Regression (1) interacts *year* with *AIDS knowledge*. Regression (2) interacts *year* with *has ever used a condom*. Regression (3) interacts *year* with *access to condoms*. Regression (4) contains all three of the interaction variables. All three interaction terms are proxy variables for the effect of the Global Gag Rule and defunding of the UNFPA. As such it was important to test each interaction variable in an individual regression to ensure they were not too highly correlated therefore muting or overtaking the significance of one another. Since the results for the interaction terms had identical significance in all four regressions. This paper uses regression (4) for the analysis discussed above.
References


http://www.usaid.gov/our_work/global_health/aids/Funding/FactSheets/africa.html


