

Condom Use and the Spread of HIV/AIDS in Muslim-majority Countries of the Middle East and North Africa

by

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INTRODUCTION

Motivation and Significance

In 2005, 58,000 adults and children died in Muslim-majority countries in the Middle East and North Africa from AIDS-related illnesses (UNAIDS 2005). The Middle East and North Africa are on the edge of entering into the world's HIV/AIDS pandemic. While the problem has not yet reached the scale of Southeast Asia or Sub-Saharan Africa, without intervention, it is only a matter of time. Helene Gayle, president and CEO of CARE USA and the co-chair of the Global HIV Prevention Working Group, has been quoted by UNAIDS as saying: "We have a critical window of opportunity over the next 10 years to dramatically slow the rate of new infections, and ultimately reverse the epidemic" (UNAIDS 2007a).

While the reported prevalence rate of HIV/AIDS is low in these countries, the possibility that these figures could rapidly increase, due to a variety of different factors, is present. Large numbers of migrant workers, prostitution, demonized and therefore underground homosexual behavior, a rise in intravenous drug use, poor quality healthcare, and low levels of condom use are all issues contributing to the spread of the pandemic. These factors are indeed numerable and have generally lacked acknowledgement and intervention on the part of local governments and the international community.

It is the purpose of this project to examine a relatively understudied factor, low levels of condom use throughout the region. This study aims to determine if there is a relationship between the prevalence of HIV/AIDS in the Muslim-majority countries of the Middle East and North Africa and the low prevalence of condom usage across the region. While the worldwide average for condom use is just under five percent, the regional average in Muslim-majority

countries studied is only about half that. With the intention of better understanding this phenomenon, an attempt will be made to determine if there are underlying religious, specifically Islamic, roots as to why condom use is so minimal in the region.

If this study is successful in linking a low frequency of condom use to the spread of HIV/AIDS, critical insight will be provided into an additional element that needs to be addressed in order to increase the effectiveness of prevention and educational measures. Averting new infections is a primary goal of those fighting the battle against HIV/AIDS, as Catherine Hankins, UNAIDS chief scientific advisor and Global HIV Prevention Working Group Steering Committee member, emphasized, explaining: “Knowing the dynamics of your own HIV epidemic, and how the last 1,000 infections have been transmitted, is key to tailoring HIV prevention strategies to really benefit those most in need” (UNAIDS 2007a).

It is this study’s hypothesis that the majority of the infections in the region are being transmitted through sexual contact – either heterosexual or men having sex with men -- and therefore, the prevalence rate of condom use bears particular weight on how people are becoming infected. It is the goal of this study to serve as a stepping stone towards further investigations into other underlying aspects of the HIV/AIDS pandemic.

HIV/AIDS and Condom Use

The subject of HIV/AIDS in Muslim-majority countries in the Middle East and North Africa has really only begun to be studied in earnest starting in 2000. Before 2000, HIV/AIDS was relatively ignored by the national governments in the region as a health concern that did not affect their countries. The attention of the international community was focused on other regions with much more dire AIDS pandemics than the Middle East and North Africa. This has changed

in the last decade, as prevention, rather than treatment, programs have come to the forefront in countries on the brink of their own HIV/AIDS epidemics. The current literature in the field is primarily aimed at identifying exactly what the specific contributors to the spread of HIV/AIDS are in the region. Most of the studies have been country-specific in nature and address which factors are most influential in that particular nation, rather than transnational reports.

One of these factors, intravenous drug use, has become rampant in the region in the last decade, most likely in conjunction with the increase of young Middle Eastern and North African men working as migrant laborers in Europe and in the oil fields of the Persian Gulf (DeJong et al. 2005). This is the contributing factor that is receiving the most attention by researchers, primarily because it has been linked to the skyrocketing of HIV/AIDS cases in Iran and the North-African states (Hasnain et al. 2005). However, the taboo subjects of transvestites, prostitution, and homosexual behavior are starting to come to the forefront as under-investigated means through which the disease is spreading (Baqi et al. 1999).

The one area that is consistently mentioned, but never actually investigated, is the low instance of condom usage as an aspect of disease transmission. As of yet, no formal studies have surveyed the overall pattern of condom use and how it relates to the spread of HIV/AIDS in the region. The World Bank's 2003 report on HIV/AIDS in the Middle East and North Africa, *The Costs of Inaction*, is currently the more comprehensive resource for information about the progression of the pandemic, but it only mentions condom use as a factor, stopping short of any further inquiry or investigation (Jenkins and Robalino 2003).

The last three years have seen two separate case studies published regarding women's preferences in contraceptive choices in Amman, Jordan (Save et al. 2004), and Istanbul, Turkey

(Sueyoshi et al. 2006). It is commonly understood that the Muslim-majority countries of the Middle East and North Africa have had an historical hostility to contraceptive use, but the exact religio-cultural reasons behind it have not been addressed. Studies on what forms of birth control are being used by women have come into focus in the last few decades, as a result of increased information on family planning spreads around the world as a byproduct of improved healthcare systems (Save et al. 2004). Both of these country-specific studies in Jordan and in Turkey show a trend towards increased use of the pill and intrauterine devices (IUDs) and a strong resistance to the use of condoms due to a multitude of religious and cultural stigma with which they are associated (Sueyoshi et al. 2006). These religio-cultural factors involve Islamic beliefs and subsequent cultural norms, including the status of women as subordinate in decision-making (Sueyoshi et al. 2006). Perhaps the most important aspect is the issue of confusion and lack of information on what forms of contraception are Islamically acceptable (Save et al. 2004) especially in regards to the influence of religious leaders (Sueyoshi et al. 2006).

There have been studies done on contraceptive prevalence in the region, and also some done specifically on condom use, just none which have resulted in any wide-scale acknowledgement of the implications of low levels of condom use. One of the only localized inquires solely regarding condom use, not just contraceptives, was conducted by Dr. Andrzej Kulczycki in a small rural community in southern Lebanon as an attempt to figure out exactly from where the visible resistance to condom use stems (2004). His findings were less than cohesive, showing the same variety of religio-cultural factors as the previously mentioned studies from Turkey and Jordan, on the part of both men and women interviewed for the study (Kulczcki 2004). Nevertheless, these factors will be further investigated later in this study as

part of a more comprehensive understanding of condom use from the religio-cultural perspective of Islam.

Islam and Condom Use

Whether or not the spread of HIV/AIDS is considered to be a national or regional concern by the local political and civic leaderships of Middle East and North African countries, it remains a public health concern the world over. It is estimated that in 2007 there were 380 000 people living with HIV in the region, where UNAIDS believes that “unsafe heterosexual intercourse is the most important risk factor for HIV infection” (2007b). Also, some of the major hurdles in the region are that “HIV prevention programmes and services remain sporadic ... knowledge of AIDS is generally poor, and preventive practices are rare, even among populations most at high risk of becoming infected” (UNAIDS 2007b).

If UNAIDS is correct, that sexual contact is the biggest mode of transmission of HIV/AIDS in the region, then the importance of condom use becomes apparent. This means that addressing regional religious and cultural values on the subject of condom use becomes paramount to keeping the infection from spreading. As the dominant religious and cultural influence in the region stems from Islam, what Islamic doctrine and practices has to say about condom use is crucial to determining how the people living in these countries form their beliefs and justify their behaviors regarding safe sexual practices.

The issue of contraceptives in Islam is unclear at best and difficult to describe. There is very little mention of contraception in the Qur’an and what is mentioned is contradictory in its interpretation (Obermeyer 1994). The value of procreation within marriage is high, similar to

Judaism and Christianity (Boonstra 2001). Children are viewed in the Qur'an as great assets -- more Muslims result in not only increased power for the family but also for the religion (Hasna 2003). Conversely, some interpretations of the Qur'an have said the opposite. There are a number of verses in the Qur'an that state that marriage is not just a means of procreation, but rather an instrument for companionship and protection. One such verse is Chapter 30:21, which describes how God "has created spouses from your own species that you may find comfort in them. And He has induced mutual love and tenderness between you" (Nooruddin 2000:451). Additionally, verses exist that are referenced in the realm of family planning that are construed to mean God does not want to burden Muslims with too many children (Underwood 2000).

The discrepancies between these two arguments -- the idea that one needs to 'get married and multiply' because the creation of additional Muslims is a major facet of being a devote practitioner, and the conclusion that God does not wish to burden believers with too many children since the needs of the family supersede the demand for too many offspring -- is the root of the debate over modern day contraceptive practices (Faour 1989). The consequence of this confusion is that many have simply concluded that Islam is *flexible* on reproductive matters (Boonstra 2001). This flexibility is where the issue of religiosity, not necessarily religion, comes into play. Religiosity is how a person interprets, views, and practices particular aspects of their religion. In this case, how Muslims interpret and behave in terms of contraceptive practices based on what they perceive their religion, Islam, to allow, recommend, or forbid. Reproductive matters then become an issue of religiosity, much more so than simply religion itself.

No direct opposition to the practice of contraception is made explicit in the Qur'an and so-called 'natural' methods of contraception, such as prolonged nursing are acceptable

techniques and are commended in the Qur'an (Libbus 1997). This prolonged nursing is described in the Qur'an, in Chapter 46:15, as taking "thirty months" (Nooruddin 2000:572). It is from this that family planning has so far not been forbidden by any Sunni or Shi'a jurists. Despite this, Shari'a does not allow the enactment of policies for birth control. So while family planning is not forbidden in Islamic Law, creating laws regarding the regulating of contraceptives is forbidden. This explanation is most likely why no Muslim-majority country in the Middle East and North Africa has any national legislation dealing with family planning practices (Hasna 2003).

Due to the lack of conclusive discussion regarding contraceptives in the Qur'an, Muslims have turned to Sunnah, and particularly the Hadiths of the Prophet for guidance. There is a famously cited Hadith in which the Prophet encourages the practice of *al-azl*, withdrawal or *coitus interruptus* (Boonstra 2001). The Hanifiya and Shafiya schools of Shari'a, as well the majority of Sunni Muslim jurists, believe this Hadith permitting the use of withdrawal as a means of contraception is acceptable because of the nature of God. That is to say, if God wanted a couple to create a child, nothing the couple could do to prevent it would be successful (Underwood 2000). Ultimately it is the will of God which prevails over the will and actions of human beings (Hasna 2003). This example has been used through Qiyass, the use of analogous interpretation, to pertain to all non-permanent barrier methods, such as condoms and diaphragms (Obermeyer 1994).

Discussion of contraception in the Islamic world really began in earnest in the 1960s, with the published reports of Shaltut (1963) and Sharabasy (1969) (Libbus 1997). Essentially, these two reports concluded that Islam supports contraceptive practice absolutely in two cases

and that there can be a variety of interpretations for every other situation. Those two unique cases are if either spouse has a *contagious disease* that could be passed along to their partner or children or if the health of the wife would be negatively impacted by a pregnancy (Faour 1989). HIV/AIDS was not a consideration when these reports were published, but they are often used now, in the contemporary realm which includes a worldwide HIV/AIDS pandemic, as a way to justify encouraging the use of condoms within marriage.

Currently, every Arab state has legislation that condones the use of contraceptives (and even abortion) when the life of the mother is at risk, but there has yet to be established any laws regarding contraceptives in the instance of one parent carrying a disease such as HIV/AIDS (Faour 1989). Permanent methods, such as hysterectomies, are even deemed permissible when additional pregnancies threaten a woman's health (Underwood 2000). Access to modern contraceptives, such as condoms, is limited in both Iraq and Saudi Arabia. There is also no governmental support of contraceptives in Libya and many of the Gulf countries as well (Faour 1989). Despite the interpretations of the Qur'an which denounce procreation as the primary goal of Muslims, there is still an ever present cultural pressure in Islamic societies to have more children and to demonize that which prevents it, such as contraception methods (Libbus 1997).

Many national studies across the region have come to the conclusion that there is a general lack of knowledge on the part of Muslims regarding how Islam feels about contraceptives (Hasna 2003). Naturally this has led to a considerable amount of contradictory and incorrect information circulating in different regions. Coupled with the factors of high illiteracy rates, rural versus urban disparity, education levels, media exposure, and age at marriage (Mahler 1999), the cultural misinformation about contraceptives has expounded into

different exaggerated fears about using them (Faour 1989). Simply put, fears and stigmas associated with contraceptives have stemmed from not only misinformation, but a lack of information about the safety of contraceptives and the religious allowance of their use (Libbus 1997).

Other issues result from the way in which Islamic culture guides women's relationships with their husbands, their mothers-in-law and religious authorities who 'prohibit' contraceptive methods for women (Petro-Nustas 2002). The factor of religious leaders is an interesting one and studies have been done increasingly in the last decade that shed light on the apparent reality that many Muslims are unsure how their religious leaders feel about contraceptives (Hasna 2003). The problem of low levels of contraceptive use is not just the result of religious interpretation, but also from translations of that particular interpretation via different religious leaders who prescribe to different sects of Islam and different schools of Shari'a interpretation (Hasna 2003).

Increasing condom use is of vital importance to diminishing the spread of HIV/AIDS across the world and the same is true in the Middle East and North Africa. Unfortunately, perceived religious and real cultural barriers are making this prevention technique difficult. One study explained the situation in this way:

Condom use was also perceived by some men to be wrong and should not be used while having sexual relations with their wives. A single man, on the other hand, indicated that condom use is practical, and it would help in preventing the transmission of sexual diseases. Such knowledge about the benefits of the condom should be highly emphasized. Living in an era where HIV/AIDS is becoming among the most prevalent diseases in the world, condom use becomes an efficient preventive strategy that should be enhanced. This calls for the importance of directing special educational messages to men in particular (Petro-Nustas 2002).

Summary of Sections to Follow

Several different public use data sets will be used to show the relationship between HIV/AIDS prevalence, condom use, and religiosity. This study will begin by understanding the scope of the HIV/AIDS problem worldwide and then treating the Middle East and North Africa as a distinct region for observing overall HIV/AIDS prevalence rates around the globe. From the regional level, this study will then examine country specific data gathered from UNAIDS which shows the prevalence rate of HIV/AIDS in each country of study. This study also includes fairly limited data collected by the World Health Organization that illustrates exactly which modes of transmission are dominant in a handful of countries and therefore, what the impact of condom use could potentially be.

The next step will be to show the percentage of condom use by country as reported by United Nations Department of Economic and Social Affairs Population Division, and subsequently, determine if there is any noticeable correlation between HIV/AIDS prevalence rates and condom use percentages. Data on religion gathered from the CIA World Factbook and limited data collected from the World Values Survey will then be considered, as religion and religiosity are the primary social cause of the low levels of condom use and the resulting spread of HIV/AIDS in the region.

THEORETICAL MODEL

The framework for this study is based on the reasoning that religiosity – how religious people perceive themselves to be -- has an influence on condom usage. Religiosity fundamentally causes HIV/AIDS through low levels of condom use. Religiosity is, therefore, the fundamental social cause (Link and Phelan 1995) of HIV/AIDS in Muslim-majority Middle East

and North African countries. Rather than simply saying “Islam” is against condom use as part of its religious doctrine, it may be more appropriate to argue that Muslims in this region who consider themselves “religious” refrain from using condoms on religio-cultural grounds, however doctrinally unsound those reasons may be.

As is well known, proximate causes are not the end of the story in terms of disease understanding and intervention. Discovering the fundamental cause, in this case, religiosity, is imperative to changing the social behavior that will change the level of risk associated with HIV/AIDS transmission. This study focuses primarily on the relationship between condom use and religiosity, not on the overall relationship between religiosity and sexual behavior. It is possible then, that people who consider themselves to be religious may be less involved in sexual activities that would make the issue of condom use relevant. That is to say that for those Muslims who practice Islam and its tenants of not engaging in sexual contact with prostitutes, homosexual encounters, or extramarital affairs, the issue of condom use becomes significantly less relevant, given the limitations in the number of partners within the prescribed context of heterosexual marriage.

The second part of this model involves the impact of condom use on the spread of HIV/AIDS; meaning that lower levels of condom use are related to higher levels of HIV/AIDS. Low levels of condom use are important because, according to a survey of the region’s countries conducted by the World Health Organization, the majority of HIV infections are sexually transmitted. It is not that HIV/AIDS is “caused” by religiosity, but rather that people who consider themselves “religious” have a tendency towards a particular behavior, i.e. not using condoms, which results in an increase in HIV/AIDS prevalence.

The theoretical model underlying this study is outlined in Figure 1.

Figure 1. Theoretical model of the relationship between religiosity and HIV/AIDS



There are two functional models that come from this kind of conceptualization. In the first stage of this theoretical model, condom use is considered to be a function of religiosity. That is to say that the more religious a population, the lower the percentage of condom use. The second stage is that HIV/AIDS is a function of condom use. Essentially, the lower the percentage of condom use, the higher the prevalence of HIV/AIDS.

Models of Religion and Condom Use

Religion, and religiosity more specifically, are the dominant force in the cultures of the Middle East and North Africa. Islam overarches and informs elements like Arab nationalism, conservatism, patriarchy, and other parts of the cultures of the region. Religion itself however, does not *do* anything. Religion, at its core is theology and doctrine (Whitehouse 2002). As was previously noted, there is little direct evidence supporting or barring the use of condoms directly in Islamic texts. Without a concrete judgment regarding condom use within Islam, the issue of sectarian interpretation arises.

Interpretation is done by the practitioners of a religion based on their own religiosity, as well as through the influence of religious leaders. Religiosity is the adherence to a belief system

and the subsequent practice that results from those beliefs (Whitehouse 2002). It is not the religion of Islam (both in Shi'a and Sunni traditions) that fails to use condoms or even dissuade or condone the use of them, it is the religiosity of Muslims, whether influenced by particular religious leaders interpretations or not, within a particular cultural context that informs them whether or not to use condoms. Thus it is not the religion itself but the measure of religiosity a person subscribes to that causes them to engage in particular behaviors not necessarily regulated by Islam.

Religiosity is also related to certain social and economic factors that need to be taken into consideration when studying condom use and HIV/AIDS prevalence, as no social phenomenon is isolated in its effect on another. GDP per capita is one of those factors. Countries with higher national incomes tend to have lower levels of religiosity, with the United States being an extreme exception. Considering country wealth will be vital to contextualizing the role of religiosity in relation to condom use and HIV/AIDS. Other social measurements, such as fertility rates, the percentage of the population living in urban environments, and the percentage of the population aged 15 – 64 (the adult population essentially), are also worthy of consideration in this relationship.

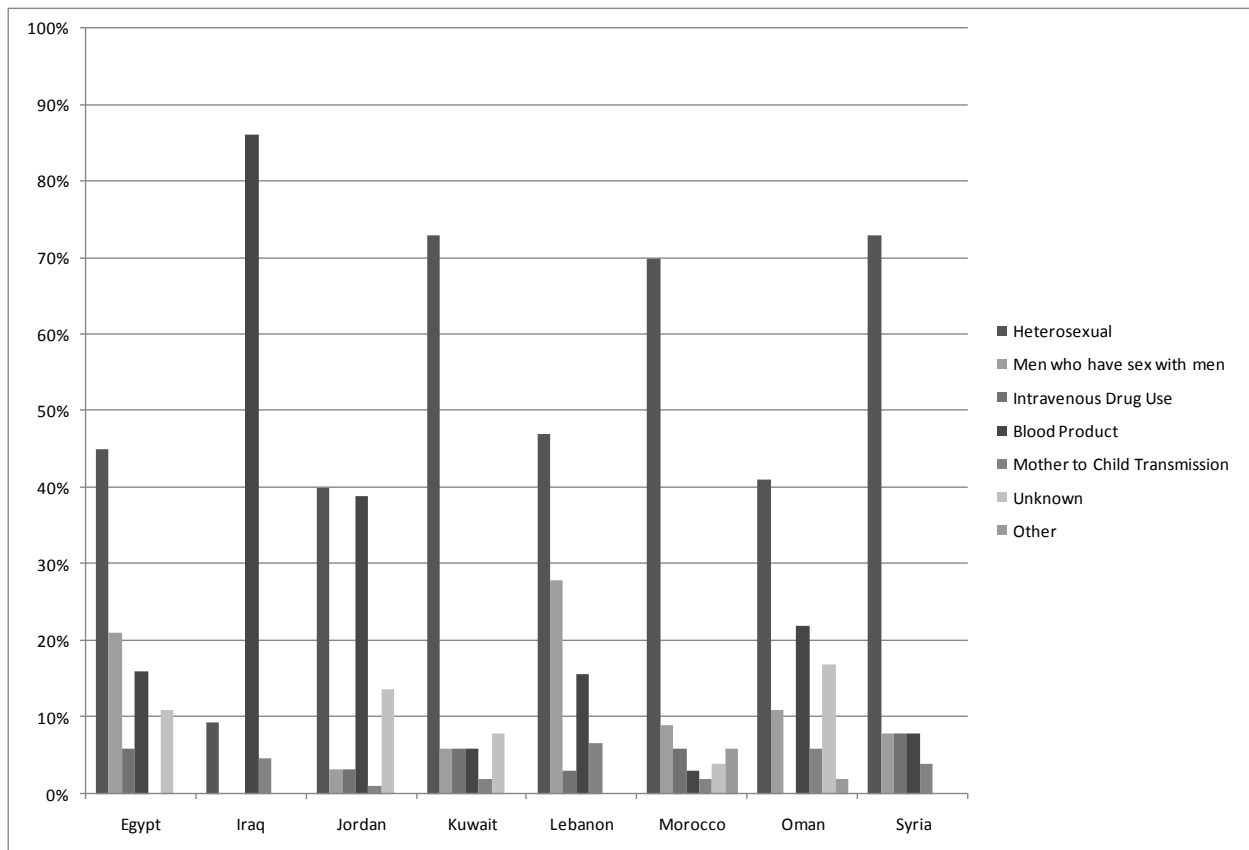
Models of HIV/AIDS Spread and Transmission

Condoms are the only contraceptive method, short of abstinence, known to prevent the transmission of diseases such as the HIV/AIDS virus. In regions where the spread of HIV/AIDS is primarily due to sexual contact, the role of condom use is critical. Understanding how HIV/AIDS is being transmitted in the countries of the Middle East and North Africa will ascertain the role of condom use as a contributing factor to the spread of the disease. The World

Health Organization has data for eight of the 21 countries included in this survey on the reported modes of transmission of HIV/AIDS cases from 1997-2000 (as a percentage of those infected).

The main categories of interest for this particular study are heterosexual transmission, men who have sex with men (MSM), unknown, and other. The unknown and other are potential categories affected by low levels of condom use. Figure 2 shows these reported modes of transmission.

Figure 2. Reported Modes of Transmission of HIV/AIDS, 1997-2000 (N=8)



It is clear from Figure 2 that the majority of HIV/AIDS infections in seven of the eight countries around the region reported heterosexual as the main mode of transmission. All eight countries show significant percentages of men who have sex with men. Sexual transmission, both hetero and homosexual, account for over 75% of the HIV/AIDS cases in half the countries

in this population. In other countries, it is still a substantial factor. Five of the countries report between four and 17 percent unknown or other modes of transmission, both of which have the potential to be impacted by the low prevalence rate of condom usage in the region.

The other three possible reported modes of transmission, as shown in Figure 2, are intravenous drug use, blood products, and mother to child transmission. As discussed in the literature review, intravenous drug use is on the rise in the region, making it a growing, but not a primary threat to the spread of HIV/AIDS in the region. Blood products have had a historically significant impact on disease transmission, but resulting infections from blood transfusions is decreasing the world over, as modern screening practices are becoming standard. Mother to child transmission is in some ways a byproduct of sexual transmission. Women in the Middle East and North Africa are becoming passively infected by their husbands, often after returning from working abroad and engaging in risky extramarital affairs with male or female prostitutes or other workers. Mother to child transmission is unavoidable when women are unaware that they have been infected by their partners.

It is hard to extrapolate from such a small sample of countries the overall modes of transmission in this region, but it is a good starting place for such an investigation. It should also be noted that these are *reported* modes of transmission by the governments of these countries, and may not in fact be accurate reflections of how the disease was transferred to those who reported infection. Additionally, this data does not reflect those who are unaware they are infected with HIV/AIDS or do not report their positive status, which is a potentially high percentage of those actually infected in the region.

DATA AND DATA SOURCES

Data for this study are drawn from a variety of sources, mainly official intergovernmental organizations, including UNAIDS, the World Health Organization, World Bank World Development Indicators, and the United Nations Department of Economic and Social Affairs Population Division. Religion and religiosity data were taken from the CIA World Factbook and the World Values Survey, respectively. Using the sources examined below provides a total number of countries for this study of between eight and 21, depending on the specific analysis.

Countries Included

The first step in conducting this preliminary investigation into the problem of HIV/AIDS transmission in Muslim-majority countries in the Middle East and North Africa was determining those countries that would be included in data analysis. There are many definitions of "the Middle East," "Near East," "Muslim Umma," so it is only to be expected that there are variations in which countries are considered part of these regional concepts. This study adopts the definition employed by UNAIDS as it is a much more appropriate list of countries than that of the World Health Organization.

Though both the World Health Organization and UNAIDS include 22 countries in their regional categorizations, the World Health Organization classifies the region as the Eastern Mediterranean, which is not entirely reflective of the populations covered in this study. The World Health Organization excludes Algeria, a country geographically included in this study, and includes Pakistan, a country on the fringes of this study. Therefore, the UNAIDS list, as shown in Table 1, is the best fit standard for using enough countries to make the study statistically significant and address the region as a whole, while making sure the sample is not too large and unmanageable.

Table 1. Countries used in analyses (N=21)

Afghanistan	Iran	Libya	Somalia
Algeria	Iraq	Morocco	Sudan
Bahrain	Jordan	Oman	Syria
Djibouti	Kuwait	Qatar	Tunisia
Egypt	Lebanon	Saudi Arabia	United Arab Emirates
			Yemen

Because this study looks at religiosity as a factor, it needs to employ the most complete list of Muslim-majority countries for the region. Because it is not Muslim-majority, Israel was not included in this study despite its having a place in the UNAIDS country list and being geographically within the region. Gaza and the West Bank Palestinian territories were also left out because they are not a formally recognized country and were not consistently included in the different data sources or by UNAIDS.

AIDS Prevalence

HIV/AIDS statistics are available from a number of sources. UNAIDS, the World Health Organization, World Bank's World Development Indicators, Demographic Health Survey, and the CIA World Factbook all offer different estimations of HIV/AIDS prevalence and incidence. The HIV/AIDS statistics used for this study are from the report produced by UNAIDS in 2006, the latest available data. In determining which resource to use for the most accurate and up-to-date prevalence rates of HIV/AIDS in the region, I found UNAIDS to have a much more complete data set (shown in Table 2) than the World Health Organization, which did

not have data for most of the countries of interest to this study beyond 2000, if any data at all.

Table 2. Adults aged 15-49 HIV/AIDS Reported Prevalence Rates (percentage of population), 2006 (N=21)

Country Name	HIV/AIDS Prevalence Rates
Djibouti	6.90%
Sudan	2.70%
Somalia	1.60%
Lebanon	0.50%
Iran	0.40%
Morocco	0.40%
Tunisia	0.30%
Afghanistan	0.20%
Algeria	0.20%
Bahrain	0.20%
Egypt	0.20%
Iraq	0.20%
Jordan	0.20%
Kuwait	0.20%
Libya	0.20%
Oman	0.20%
Qatar	0.20%
Saudi Arabia	0.20%
Syria	0.20%
United Arab Emirates	0.20%
Yemen	0.20%

Other sources, such as the CIA World Factbook (which primarily uses estimations from UNAIDS and the Demographic Health Survey), were not consistently available for every country, were considered but not used for this study for that reason. Data on HIV/AIDS

prevalence was reported by UNAIDS for all 21 countries in the study population as defined above.

Prevalence of HIV/AIDS, not incidence (number of new HIV/AIDS cases) was chosen because while prevalence rates have their own set of accuracy problems, incidence is generally much more underreported and therefore a less accurate measure of the scale of the HIV/AIDS epidemic in the Middle East and North Africa.

Table 2 illustrates the relative uniformity of HIV/AIDS rates across the region -- 14 of the 21 countries studied have estimated prevalence rates of 0.2 percent. However these are generally projections made by UNAIDS due to a lack of underreporting by national governments. In countries where the HIV/AIDS prevalence rates are above 0.2 percent, it is because of an increase in UNAIDS-sponsored surveillance programs within the countries in cooperation with local authorities. The countries with the three highest prevalence rates -- Djibouti, Sudan, and Somalia -- are all in eastern Africa.

Modes of Transmission

It is not just the prevalence of HIV/AIDS in the Middle East and North Africa that is important to this study. How the prevalence came to be, specifically the way in which HIV/AIDS is transmitted from person to person in these countries helps shed light on the contributing factors to the disease. This study aims to show a relationship between low levels of condom use and HIV/AIDS. Identifying what the dominant mode of transmission is in these countries will help determine what responsibility condoms play in how HIV/AIDS is spread.

The World Health Organization, while not used for HIV/AIDS prevalence due to inconsistent recording, does offer limited data in regard to the modes of transmission of HIV/AIDS infections. Data is available from country-specific reports for eight of the 21 countries in the study population. Although there are only eight countries reporting specific modes of transmission to the World Health Organization, these eight countries are fairly geographically representative of the region. Table 3 shows that there are North African, Gulf, Levantine, and Arabian countries represented in this data.

Table 3. Modes of Transmission of HIV/AIDS, 1997-2000 (N=8)

Country Name	Heterosexual	Men who have sex with men	Intervenes Drug Use	Blood Product	Mother to Child Transmission	Unknown	Other
Egypt	45%	21%	6%	16%	<1%	11%	
Iraq	9.30%			86.10%	4.60%		
Jordan	40%	3.20%	3.20%	38.90%	1.10%	13.70%	
Kuwait	73%	6%	6%	6%	2%	8%	
Lebanon	47%	28%	3%	15.60%	6.70%		
Morocco	70%	9%	6%	3%	2%	4%	6%
Oman	41%	11%		22%	6%	17%	2%
Syria	73%	8%	8%	8%	4%		

Although this data is only representative of less than half of the study population, there is no other equivalent data available to support the large implications of low condom prevalence as a factor in how HIV/AIDS is being transmitted around the region. Sexual transmissions, both heterosexual and homosexual, are the majority modes of transmission in seven of the eight

countries in the sample. Additionally, the categories of unknown and other have the potential for sexual transmission as well, increasing the importance of the low levels of condom use in the region.

Condom Use

Contraceptive data, unlike HIV/AIDS statistics, is not available from a variety of sources. The percentages of condom use chosen for this study are from the United Nations Department of Economic and Social Affairs Population Division on World Contraceptive Use in 2005. The contraceptive prevalence data from the World Bank's World Development Indicators were considered, but those figures are for all forms of contraception, not just condoms. The UN Population Division data is compartmentalized by percent for various types of contraception, including a category for condom use, so it was a much better fit for this research.

The percentages reported by the UN Population Division in 2005 are for married women aged 15 to 49 and there is data available for 18 of the 21 countries in the study population, as shown in Table 4. Data was not available in 2005 for the countries of Djibouti, Libya, and Somalia. The data for those three countries was excluded when performing the data analyses because they have no data. Afghanistan and Lebanon reported zero percent condom use for 2005, which was intentionally included in the analyses, in order to emphasize just how low reported levels of condom use are in the region. Due to how skewed the data is, the log 10 of condom use was used in analysis.

Table 4. Married Women aged 15-49 Who Reported Using Condoms (percentage of population),
2005 (N=18)

Country Name	Reported Percentage Using Condoms
Bahrain	9.60%
Iran	5.40%
Jordan	3.40%
Kuwait	2.90%
Qatar	2.90%
Algeria	1.50%
Morocco	1.50%
Oman	1.50%
Iraq	1%
Egypt	0.90%
Saudi Arabia	0.90%
Sudan	0.30%
Syria	0.30%
Tunisia	0.30%
United Arab Emirates	0.30%
Yemen	0.30%
Afghanistan	0
Lebanon	0

Bahrain has the highest reported percentage of condom use of all the countries. At 9.6 percent, it is almost double Iran, the second highest rate at 5.4 percent. Almost half the countries with available data report less than 1 percent condom use.

Religion and Religiosity

In order to measure the prevalence of Islam in the study population, religion data reported by the CIA World Factbook was used in this study. The CIA World Factbook was chosen in order to ensure that the countries in the study population are Muslim-majority, and the CIA World Factbook reports data on the percentages of each religion in a given country. Data is available for 19 of the 21 countries in the study population and, while a percentage of Muslims is not available for Somalia and Yemen, what is listed is the sect of Islam dominant in the country: Sunni in Somalia and Shaf'i (Sunni) and Zaydi (Shi'a) in Yemen. What percentage of the population in each country prescribes to which sect, however, was not reported.

Additionally, 16 of the 21 countries report what sect(s) of Islam are found within each country. This information is potentially useful because, as previously mentioned, there are differences between Sunni and Shi'a interpretations of Hadith and Shari'a, resulting in potentially different rates of condom use and HIV/AIDS prevalence. Iran, which has the second highest reported percentage of condom use, is 89 percent Shi'a. There are also substantial Shi'a populations in Bahrain and Kuwait, two of the countries with high reported rates of condom use.

The countries with the highest HIV/AIDS prevalence rates – Djibouti, Sudan, and Somalia – are identified by the CIA World Factbook as being majority Sunni. Although, Lebanon and Iran both appear at the in top of the HIV/AIDS prevalence list, and both countries

have significant Shi'a populations. Concrete connections cannot yet be determined between the different sects of Islam and any potential influence on condom use or HIV/AIDS because the data reported by the CIA World Factbook on the sectarian breakdown of each country is incomplete and therefore not able to be used in conclusive analyses.

Data from The World Values Survey on religiosity is also being included as a second tier of understanding the impact of religion on condom use and the spread of HIV/AIDS. This data, however, is only available for a limited number of countries. The eight countries that offer data on religiosity are a measure of the percentage of the population that considers themselves personally religious. This will assist in estimating the impact of a certain behavior, in this case, use of condoms, by people who consider themselves Muslim, not just people who were born Muslim. Table 5 shows both the reported percentage of Muslims in each country in the study, as well as the percent religious (the measurement of religiosity) when available.

Table 5. Reported Percentage Muslim in Each Country (N=19) and Reported Percentage of Muslims Surveyed Who Consider Themselves to be Religious (N=7)

Country Name	Percent Muslim	Percent Religious
Afghanistan	99	
Algeria	99	59
Bahrain	81.2	
Djibouti	94	
Egypt	90	98.7
Iran	98	94.9
Iraq	97	86.7
Jordan	92	85.9
Kuwait	85	
Lebanon	59.7	
Libya	97	
Morocco	98.7	94.6
Oman	75	
Qatar	77.5	
Saudi Arabia	100	70.4
Somalia		
Sudan	70	
Syria	90	
Tunisia	98	
United Arab Emirates	96	
Yemen		

Other Variables

There are a few other variables that should be taken into consideration when trying to decipher a relationship between religiosity, condom use, and HIV/AIDS, shown in Table 6.

Gross National Product (GDP) per capita is important because it is generally “poorer” countries that are most impacted by HIV/AIDS, so assessing where the countries of this study fall economically becomes relevant. The urban demographic is relevant because it shows whether or not people are concentrated, which has a bearing on how disease is spread, how condoms can be distributed, and how healthcare services can be made available. The fertility rate is a measure of population growth, an indicator of how a country is reproducing. Percentage of the population aged 15 to 64, basically the adult population, is the best-fit demographic for the population at risk for HIV/AIDS in the countries of this study. Typically, HIV/AIDS has the largest impact on the adult population, not on children in this region.

Table 6. Other Variables used in analyses, 2005

Country Name	GDP per capita			
	Current USD (in millions)	Percent Urban	Fertility Rate	Percent of the Population Aged 15-64
Afghanistan	7,308	23	7	53
Algeria	102,256	63	2	66
Bahrain	12,914	97	2	70
Djibouti	709	8	5	56
Egypt	89,369	43	3	62
Iran	189,784	67	2	67
Iraq	40,660	67	4	58
Jordan	12,712	82	3	60
Kuwait	80,781	98	2	74
Lebanon	21,944	87	2	64
Libya	38,756	85	3	66
Morocco	51,621	59	2	64
Oman	27,250	72	3	63
Qatar	42,463	95	3	77
Saudi Arabia	309,778	81	4	60
Somalia	2,483	35	6	53
Sudan	27,542	41	4	57
Syria	26,320	51	3	60
Tunisia	28,683	65	2	68
United Arab Emirates	129,702	77	2	77
Yemen	15,066	27	6	51

All of this data was obtained from the World Bank World Development Indicators, except where noted. Highlighted data was missing from the WDI and therefore taken from the

CIA World Factbook. Additionally, because of the skewed nature of the GDP per capita data, the log 10 of this data was used in analysis.

RESULTS

The main theoretical model for this study outlines that religiosity has a negative effect on condom use. That is to say that where religiosity is higher, condom use will be lower. Subsequently, where condom use is lower, HIV/AIDS prevalence will be higher. The regression models for this study are in the expected directions to support this argument; however they are not statistically significant at the $p < 0.05$ level of significance. Due to the limited availability of data for religiosity, religion was used for comparative purposes. There does not appear to be a significant relationship between religiosity/religion and condom use or between condom use and HIV/AIDS prevalence. This could be due to the severe underreporting of HIV/AIDS prevalence in the majority of countries in this study, making a statistically significant relationship hard to determine with such unreliable data. Additionally, the small sample of data available for religiosity makes a relationship of any sort difficult to decipher.

Religiosity and Condom Use Results

In order to estimate the effect of religiosity on condom use, condom use was first regressed on religiosity alone, then in the presence of control variables. Controls included GDP per capita, national fertility rates, percentage urban, and the percentage of the population aged 15 to 64. These additional variables were controlled for because they are significant social and economic influences on the study population. GDP per capita is considered to be the most impactful additional variable because of the connection between economics and religiosity. Fertility rates are next because of their connection to contraceptive measures, followed by the urban population, who are generally the most impacted by availability of different forms of

contraception. Finally, the age range of 15 to 64 is the last control, as it is the target population for persons who would be using condoms and also the population the most impacted by HIV/AIDS in this region.

Religiosity is the preferred operationalization for the role of religion in condom use, but this variable is only available for seven of the 21 countries in this study. Religion, as the percent Muslim within a country, however, is available for a larger panel, 19 of the 21 countries. Religion is therefore used in primary analysis, as shown in Table 7, because the variable of religion allows for the most cases to be studied, even though it is not as appropriate a measurement as religiosity. The World Values Survey is a far more appropriate measure religiosity than the CIA World Factbook religion data; however it is only available for a small number of cases.

Table 7. Regression Models for Condom Use (N=15)

Log(Condom Use)	Model 1	Model 2	Model 3	Model 4	Model 5
Religion	-0.096	-0.062	-0.180	-0.074	-0.411
Log(GDP per capita)		-0.067	-0.023	-0.044	0.286
Fertility Rate			-0.355	-0.173	-0.766
Percent Urban				0.570	1.003
Population Aged 15-64					-0.955
N	15	15	15	15	15
R-squared	0.009	0.013	0.128	0.421	0.623

The coefficient for religion is negative in Model 1, indicating that as religion increases, condom use decreases. It is not significant using a $p < 0.05$ level of significance. Because GDP per capita is the most important additional variable, it was controlled for first. The resulting relationship between religion and condom use was still not significant, at the $p < 0.05$ level, but the coefficient for religion remained negative. The slight decrease in strength could be the result of controlling for GDP per capita.

Models 3 through 5 are only included for completeness, but because of the small number of degrees of freedom, the results of these models will not be used for interpretation. While none of the models in Table 7 have significant coefficients for religion, they are all in the expected negative direction. In all of these models higher levels of religion are associated with lower levels of condom use.

In Table 8, instead of religion, condom use was regressed first with religiosity alone, and then with the same additional economic and social controls present in Table 7. Table 8 also shows no significant correlation at the $p < 0.05$ level of significance between religiosity and condom use, just as there was no significant relationship between religion and condom use in Table 7. However, all of the models in Table 8 have a positive coefficient for religiosity, the opposite of what is expected.

Table 8. Regression Models for Condom Use (N=7)

Log(Condom Use)	Model 6	Model 7	Model 8	Model 9	Model 10
Religiosity	0.224	0.188	0.134	0.506	0.559
Log(GDP per capita)		-0.141	-0.160	0.021	-1.186
Fertility Rate			-0.546	-0.794	2.135
Percent Urban				0.816	0.718
Population Aged 15-64					3.175
N	7	7	7	7	7
R-squared	0.050	0.069	0.364	0.814	0.997

While religiosity is a preferred measure of how religious each Muslim-majority country is, it is only available for a small number of countries. Religiosity is the preferred measure of Islam, rather than just percent Muslim, in this study because it is a better indicator of how religious these populations perceive themselves to be, rather than just to what religion they were born. Models 6 through 10 are included only for comparability and should be taken with a grain of salt because due to the small sample, it is difficult to obtain a statistically significant

correlation between the two variables. Even though the sample size is small it is puzzling as to why all of the models in Table 8 are in the positive direction.

Religion and Religiosity Results

The reason Model 6 in Table 8, the effect of religiosity on condom use, may exhibit a positive coefficient for religiosity could be related to the specific seven countries of religiosity data available from the World Values Survey. Figure 3 shows the positive trendline of the religiosity data and condom use for those seven countries.

Figure 3. Religiosity and Log(Condom Use) (N=7)

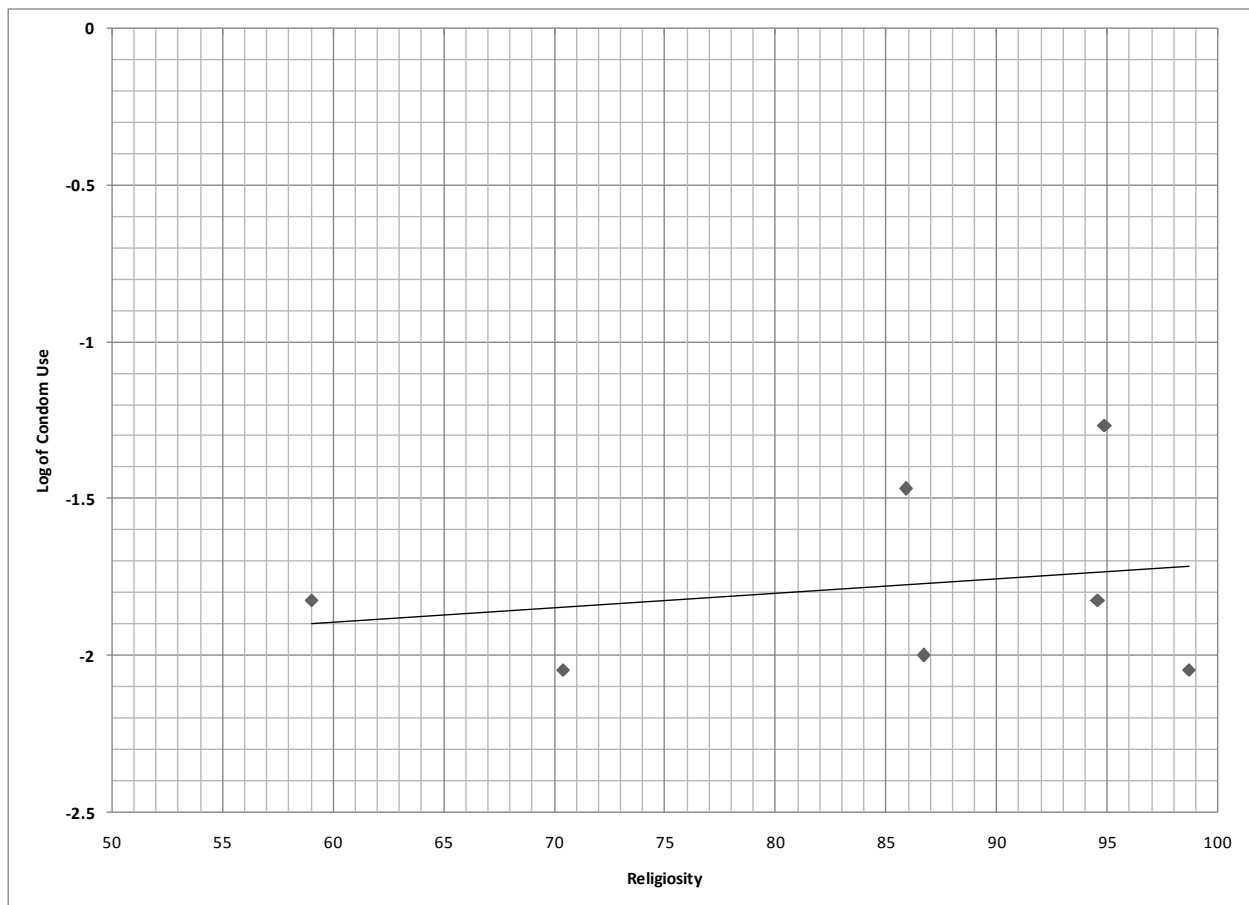


Figure 3 clearly shows that there is a positive slope between religiosity and condom use. It appears as though when a country is more religious, there is a higher rate of condom use. As comparison, the same seven countries were selected from the CIA World Factbook data on religion. Figure 4 shows the relationship between religion and condom use in those seven countries.

Figure 4. Religion and Log(Condom Use) (N=7)

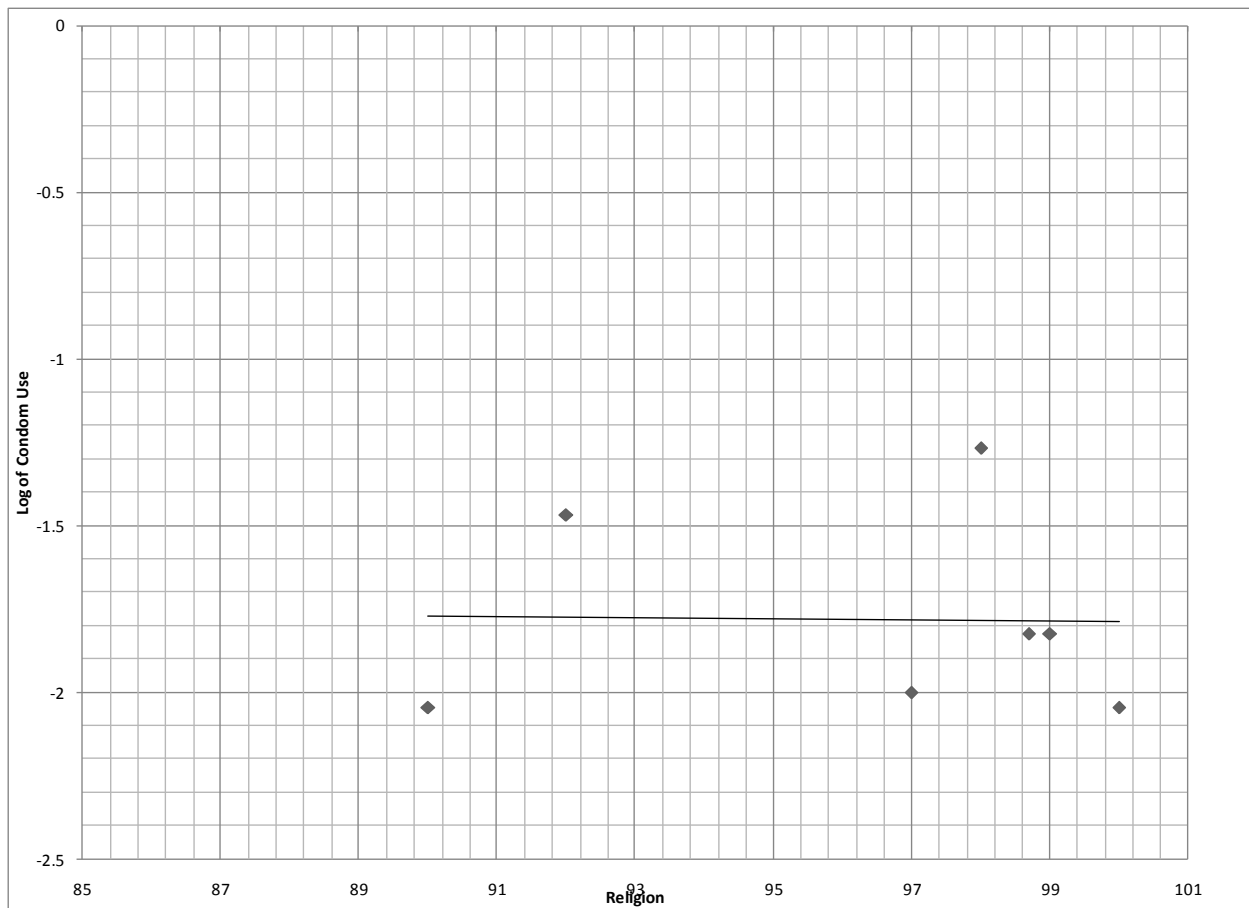


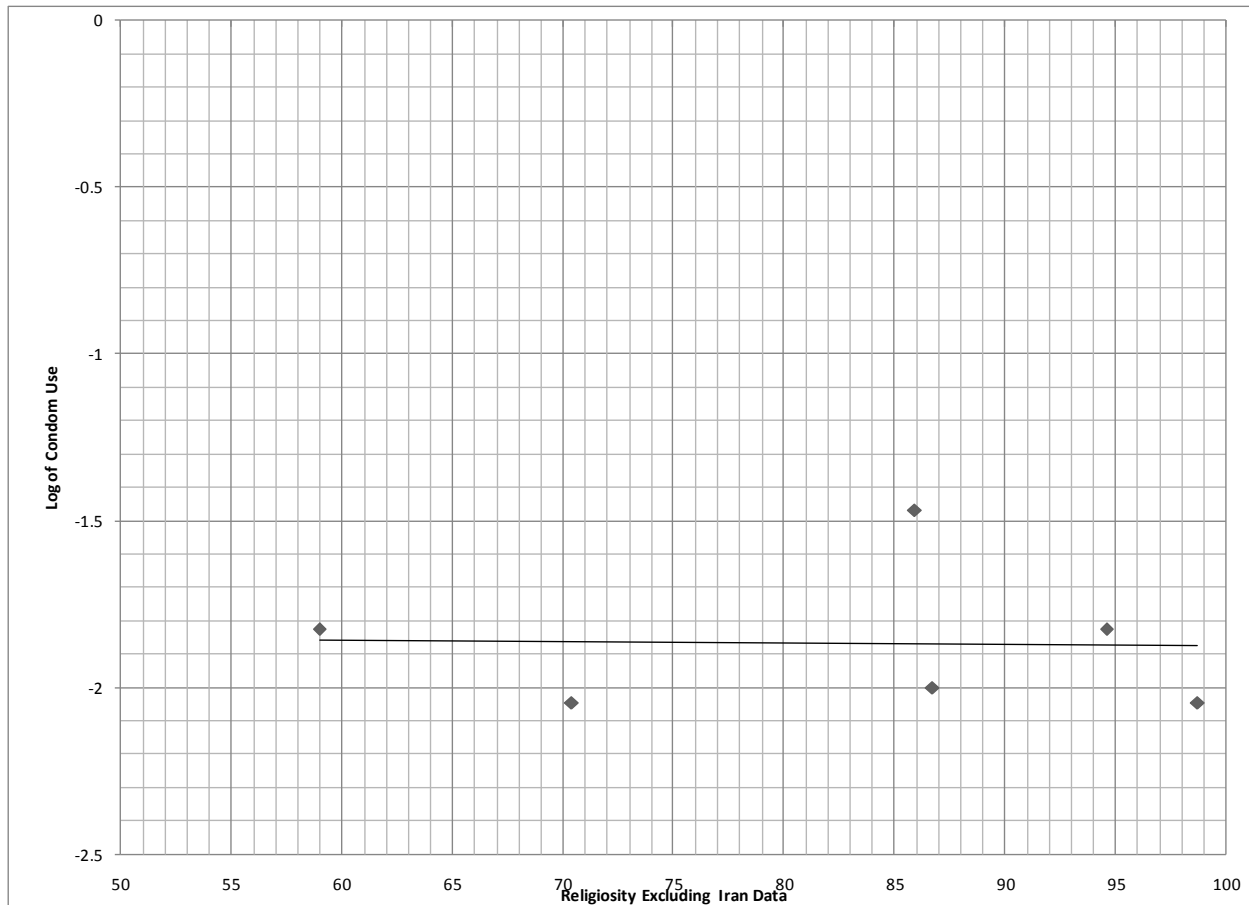
Figure 4 shows the relationship between religion and condom use of the same seven countries used by the World Values Survey religiosity measure. The trendline in Figure 4 is different from the positive trendline in Figure 3. The trendline in Figure 4 is flat. On the surface

it does not appear that it is specifically those seven countries with available data that cause a positive relationship between religiosity and condom use.

However, there is an outlying point, one with high religiosity and high levels of condom use that could be causing Figure 3, the religiosity data to become positively correlated. This point in Figure 3 corresponds to the country of Iran, which has a 94.9 percent religiosity rate as well as the second-highest condom use percentage, at 5.4 percent.

When Iran was removed from the data, as shown in Figure 5, the trendline for religiosity is similarly flat to that of the trendline in Figure 4, the religion data. This means that religiosity is not necessarily positively related to condom use, but that because of one extreme outlier, Iran, when included in such a small sample size of those specific seven countries, creates a positive relationship where it would not have been otherwise. It is difficult to speculate, given the lack of religiosity data by the World Values Survey for the other 14 countries in the study what the overall relationship between religiosity and condom use is for all the Muslim-majority Middle East and North Africa countries.

Figure 5. Religiosity and Log(Condom Use), excluding Iran (N=6)



Condom Use and HIV/AIDS Results

In order to estimate the effect of condom use on the prevalence of HIV/AIDS, HIV/AIDS prevalence was first regressed on condom use alone, then in the presence of control variables. Controls included GDP per capita, national fertility rates, percentage urban, and the percentage of the population aged 15 to 64. These additional variables were controlled for because they are significant social and economic influences on the study population, as discussed previously. Table 9 shows the regression model for HIV/AIDS.

Table 9. Regression Models for HIV/AIDS (N=16)

HIV/AIDS	Model 11	Model 12	Model 13	Model 14	Model 15
Log(Condom Use)	-0.247	-0.246	-0.261	-0.018	-0.033
Log(GDP per capita)		-0.061	-0.070	-0.048	-0.043
Fertility Rate			-0.034	-0.166	-0.195
Percent Urban				-0.447	-0.412
Population Aged 15-64					-0.057
N	16	16	16	16	16
R-squared	0.061	0.065	0.066	0.160	0.160

The coefficient for condom use is expectedly negative for all the models in Table 9.

None of the models are significant at the $p < 0.05$ level of significance. This indicates that while not statistically significant, the overall trend is that as HIV/AIDS prevalence increases, condom use decreases. Again, Models 13 through 15 are only included for completeness of the variables and will not be used in discussion.

DISCUSSION AND CONCLUSIONS

In terms of HIV/AIDS cases, the total number of adults and children living with HIV/AIDS in this region was projected to be around 510,000 in 2005 (Jenkins and Robalino 2003). As the previous figures and tables have indicated, the prevalence of HIV/AIDS is not consistent around the region. The countries with the highest prevalence rates appear to be in North Africa, but this may have more to do with more consistent surveillance and reporting by UNAIDS and the World Health Organization than how prevalent the virus is in reality. There is more being done to combat HIV/AIDS in the North African countries on the whole than there is in the Middle Eastern countries surveyed for this project. The majority of the Middle Eastern countries report 0.2 percent HIV/AIDS prevalence, which in all likelihood is simply a “best guess” by UNAIDS as to the actual prevalence rate because of a lack of reported data.

This study aimed to pinpoint Islam as a primary factor in the spread of HIV/AIDS in Muslim-majority countries in the Middle East and North Africa. The higher the percentage Muslim of a country, the lower the percentages of condom use; this supports the claim that Islam is the dominant influence on condom use, which is alarmingly low in these countries. While the initial hypothesis of this study stated that it is religiosity, not religion, which was the fundamental social cause of HIV/AIDS in this region, it seems that neither measure of Islam yield statistically significant results.

While the theoretical model of this study cannot be confirmed at this time, the results displayed in Tables 7, 8, and 9 are important to understanding the relationship between religiosity/religion, condom use, and HIV/AIDS prevalence. Tables 7 (religion and condom use) and 9 (HIV/AIDS prevalence and condom use) show the theoretically expected negative direction, but not anything significant. Therefore, strong confirmation of the theoretical model is not possible at this time, but there is evidence to support that the model is correct, just not statistically significant. The results tend to be in the direction expected, and there are strong qualitative reasons that religion, especially religiosity, is important, even if it cannot be statistically demonstrated in this study. Qualitatively the model still makes a strong argument.

The relationship between religiosity and condom use is more difficult to determine, because there are so few countries for which religiosity data is available. The lack of significance between religiosity and condom use at the $p < 0.05$ level of significance does not discount the main results of a relationship between Islam and condom use. A relationship between religiosity and condom use was not able to be shown with any certainty because of the extreme outlier of Iran within such a small sample size of countries with available religiosity data. While the religiosity was not able to be successfully correlated to condom use, religion

was, at least directionally, although not statistically significantly, due a much larger availability of data for religion as a variable.

As expected, the relationship between condom use and HIV/AIDS prevalence was negative, although not statistically significant. This generally supports the theoretical model expressed in Figure 1, that where condom use is lower, HIV/AIDS prevalence rates are higher. Despite the fact that these models were not significant does not affect the well known fact that condom use has an impact of the spread of HIV/AIDS, especially in regions like the Middle East and North Africa, where sexual contact is the leading mode of transmission.

It has been previously argued that religion in general is a protective factor against HIV/AIDS, but this does not seem to be the case for Islam. This study indicates that low levels of condom use are related to the observance of Islam in the Middle East and North Africa. A rise in Islamic fundamentalism would result in an increase in Islam, and therefore anti-family planning attitudes and a decrease in condom use. It could also push deviant behaviors, such as homosexual encounters, intravenous drug use, prostitution, and other risk factors for HIV/AIDS transmission further underground and potentially less safe. The issue then becomes a matter of unfortunate timing: the spreading of religiosity coinciding with the brink of a disease epidemic.

The implications of this study are that the lack of condom use in the Muslim-majority countries of the Middle East and North Africa seem to be associated with Islam. This fact could have imminent ramifications on the future of the epidemic in the region, as well as the larger HIV/AIDS pandemic. International health organizations and local governments should consider significant changes to education and intervention policies to reflect the role of Islam as the important social cause of HIV/AIDS. Through understanding more about how Islam functions in this epidemic, comprehensive programs working through religious and cultural avenues can

become more effective. More needs to be done on the part of each country's government and health ministries to provide better access to overall health care, but specifically HIV testing, education about the disease and its causes, and prevention measures. Cooperation with international bodies, such as the World Health Organization and UNAIDS, is also important to providing the financial support and infrastructure needed to provide these public services.

No longer can policy makers within and without the Middle East and North Africa ignore the HIV/AIDS epidemic that is impacting thousands of people in this region on a daily basis. International health organizations need to reform their approach to education and prevention programs to reflect the religious and cultural influence of Islam to ensure effective intervention in the region. Local civic and governmental leaders also need to reassess the previously held attitude that HIV/AIDS does not impact their populations because their Muslim. HIV/AIDS *does* impact their populations, and Islam is a considerable part of its transmission.

This study, while limited to Muslim-majority countries in the Middle East and North Africa, has implications for Muslim populations around the world. Islam is the fastest growing religion in the world, with over a billion adherents, so the potential implications of this study affect other regions where Muslims are significant portions of the population. This means that Islam should be elevated to a significant concern for global public health in general, as well as the entire HIV/AIDS pandemic. The Middle East and North Africa are on the edge of full-blown epidemics and without decisive action now, it is only a matter of a few years before the situation will be beyond repair.

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