An Analysis of National HIV/AIDS Education Efforts Among 15-39 Year Olds and Health Care Workers Applying the Health Belief Model (HBM) in Six Cities in Sonsonate, El Salvador

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Chapter 1

Introduction

Global impact of Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS)

The HIV/AIDS pandemic continues to escalate all over the world. Since the first case was reported in the United States in June 1981, it is estimated that 65 million people have been infected worldwide of whom 25 million have died (Zerhouni, Whitescarver, & Fauci, 2006). In 2006, it was estimated that 39.5 million people are living with HIV worldwide with 2.9 million deaths occurring that year ("2006 Report on the global AIDS epidemic: A UNAIDS 10th anniversary special edition," 2006). The effects of this pandemic are far reaching. The fight continues as to how best to combat this deadly disease. With no vaccine available, concentration has been placed on symptomatic treatment and education about transmission and prevention methods as an attempt to halt this disease's progression.

HIV in El Salvador

Although 62.5% of the worldwide prevalence of HIV/AIDS is confined to the continent of Africa, HIV/AIDS is a true pandemic reaching across the entire globe. Among those nations effected, El Salvador, population 6.8 million people, a small country with a total population less than that of Manhattan, NY, is amid its own fight against the spread of HIV/AIDS ("2006 Report on the global AIDS epidemic: A UNAIDS 10th anniversary special edition," 2006; Epidemiological fact sheets on HIV/AIDS and sexually transmitted infections," 2006). The first case of AIDS was reported in El Salvador at Hospital Rosales in San Salvador in October 1985 in a bisexual

man who had recently returned from the United States (Martinez De Quintanilla, 1992). Since then, the epidemic has continued to grow seemingly concentrated in the urban areas.

Since 1991, a steady increase in the annual incidence has occurred, from 2.5 per 100,000 population in 1992 to 7.6 per 100,000 in 1996 ("Epidemiological fact sheets on HIV/AIDS and sexually transmitted infections," 2006; PAHO, 2005). As of December 2005, 16,343 cases of HIV/AIDS have been reported to the National AIDS Program with 9,004 of those being HIV positive and 7,339 cases having AIDS. The highest prevalence rates for reported HIV cases are the departments of San Salvador, Sonsonate, and La Libertad with 9061, 1177, and 1055 cases reported respectively (National Program of STDs, 2007b; *The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006). In 2005, an average of 4.4 persons were infected with HIV every day in El Salvador (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006).

The accuracy of reported HIV/AIDS cases varies worldwide. Attempting to comply with the recommendations of the WHO and UNAIDS, most countries have a reporting system for HIV/AIDS cases. The difficulty in accuracy, however, lies in the quality of the reporting system in use. Reporting rates are low in developing countries due to limitations in the health care and epidemiological systems within the country ("Epidemiological fact sheets on HIV/AIDS and sexually transmitted infections," 2006). In El Salvador, depending on the source, the estimates range from as low as 20,000 to a maximum of possibly 36,000 individuals living with HIV/AIDS ("Country profile HIV/AIDS: El Salvador," 2004; USAID, 2004; Vazquez, Cedillos, & Wheeler, 2003). Prevalence rates of persons living with HIV/AIDS range from 0.5% to 0.7% within the

general population up to 17.8% in high-risk populations ("2006 Report on the global AIDS epidemic: A UNAIDS 10th anniversary special edition," 2006). According to the AIDS National Program data, the number of HIV cases from 2001-2005 has increased over the number of AIDS cases. This may be a result of the initiation of anti-retroviral therapy (ART) in 2001 and an increased effort to offer free HIV tests (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006). The increased numbers of HIV positive individuals could be a result of longevity resulting from ART in those who have not yet developed AIDS. However, it could also be a product of that since more diagnostic testing is being offered, more individuals are being found to be HIV positive. Regardless of the reason, the fact remains that the numbers of HIV positive individuals in El Salvador continues to rise, thus increased awareness and continued diligence in prevention efforts are needed.

The most heavily affected population, in El Salvador, is the 15-39 age group with 35% to 67.4% of reported AIDS cases occurring within this age range (USAID, 2004). This age range accounts for over half of the total population, 3.6 million individuals, and also represents the most economically productive and sexually active population in the country ("Epidemiological fact sheets on HIV/AIDS and sexually transmitted infections," 2006; *The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006). As of 2005, AIDS has become the third leading cause of death among individuals 20-24 years of age in El Salvador and the second among individuals 25-49 years of age (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006). Based on population and current infection rates, anywhere from 1.3 to 2.4 million individuals in this age range will

become HIV positive during their lifetime. Unless this rate can be slowed, the future population of El Salvador will be devastated.

The prevalence between males and females, in El Salvador, differs significantly. The ratio of infected men is almost double that of women at 1.9:1 (USAID, 2004). One report stated that in 2000, 3,482 cases were reported with 73.3% of those being male (PAHO, 2005). The predominate route of transmission is by sexual contact which accounts for 84% to 88.5% of all cases with 76% transmitted heterosexually, 4% to 7.2% transmitted through anal intercourse, and 3% to 5.5% transmitted bisexually (USAID, 2004). Vertical transmission, from mother to child, accounts for approximately 4% of cases and intravenous drug use and blood transfusions combine for another approximately 2% of cases ("Epidemiological fact sheets on HIV/AIDS and sexually transmitted infections," 2006; PAHO, 2005). El Salvador has been described as having a centralized HIV/AIDS epidemic and as such, education efforts at the present time are concentrated within the cities, namely San Salvador. However, a hidden epidemic in El Salvador remains, apparently due to ongoing stigma and associations of inevitable death, immorality, and homosexuality related to being infected with HIV (USAID, 2004).With this in mind, the prevalence in the outlying/rural areas may be higher than is currently known simply because of the regional and demographic isolation compared to the cities. Efforts to reach

those in rural areas requires acknowledgement of the existing difficulties and finding ways to overcome them.

Purpose of the Study

The purpose of this study was to apply components of the Health Belief Model (HBM) of behavior change to the general population aged 15-39 in Sonsonate, El Salvador to determine the impact that multiple educational efforts have made on educating the population about HIV/AIDS by assessing the level of knowledge, the perceived susceptibility, the perceived severity, and the level of behavior change within this population. It analyzed how the educational efforts have served as cues to action along the continuum leading to behavioral change as outlined in the HBM and ultimately to what extent this population is engaging in behavioral change in regards to this health issue (Figure 4). Future recommendations will be made as to how best to conduct future HIV/AIDS prevention programs for this population.

Research Questions Specific to the Study

1. What was the current knowledge level of HIV/AIDS causes, prevention, and transmission among a population ranging from 15-39 and a population of physicians in six cities throughout Sonsonate, El Salvador?
2. How did the measure of perceived risk, perceived susceptibility, and participation in risky behaviors relate to each other and to knowledge level for a population aged 15 – 39 in the target area?
3. Where were the areas that have significant knowledge, perception, or behavioral deficits regarding HIV/AIDS within the target population?

Significance of the Study

This analysis provided a better understanding of how the study population received the educational campaigns in relation to the principles of the HBM. The analysis consisted of the general population, aged 15-39, health care providers, and compiled,

national data from the study area. Through triangulation of these various data sets, a clearer understanding was gained about the general populations' perceived risk, perceived susceptibility, and initiation of behavioral change as it is compared to that of the health care providers and the actual quantitative data available for the area. In addition, the utilization of a Geographical Information System (GIS), allowed the results to be displayed in a graphical format so that specific populations of people with specific knowledge deficits and unique educational needs were identified and can be targeted in future educational efforts. From this study, recommendations to improve effectiveness of future HIV/AIDS prevention programs will be determined.

Delimitations

Conducting a study in an international setting brings many challenges that are direct contributors to these delimitations. In this study, study design was a delimitation. The choice to embark upon a one-time "snapshot" look at this population was made based on several factors. The researcher wanted to conduct a study with a large population (n) so that broad as well as target conclusions could be reached as to the educational level of the population in regards to HIV/AIDS and that relation to the Health Belief Model (HBM). To ensure a large sample size, the researcher designed this study so that varying populations would be involved. This decision was to allow this study to be conducted in six different cities/villages at the same time. Also, by ensuring a large sample size and spreading the study across such a large geographical region, the idea of follow-up seemed like an undoable notion. In addition the cultural nature of the population in this country is such that the idea of follow-up and returning for future sessions as part of a research project is entirely a foreign concept. With the time

constraints for the researcher to be in country and for the success of the study, the researcher chose to limit the study design by designing it as a one-time survey of the population. The goal of the researcher to have a substantially large sample size, encompassing several geographical areas, and the cultural tendencies of the target population were all combined in the decision to pursue a study with only a one-time interaction with the sample.

Another delimitation related to study design is physical location of where the study will take place. The researcher again wanted a large sample size (n) so the study was conducted at the equivalent of a health department in each of the six cities/villages (Unidad de Salud). These locations are well known by the entire community and the services offered at them range from medical consultations with a physician to nutrition counseling for families. Also, these are gathering places for people in each of the communities. They serve almost as community centers do here in the United States. The researcher wanted to ensure a mixture of the population within the sample and thus chose to use the health departments as intake centers for participants in the study.

Limitations

Limitations of this study involved aspects surrounding sample demographics. Even though efforts were made to conduct this study at locations within the community that would attract a wide variety and range of participants, since this study was a one-time survey of the population, the sample demographics were widely influenced by chance. Whoever happened to show up during the time of the study and qualified was included and no effort was made by the researcher to influence this.

Another limitation of this study was the relative lack of randomization of the sample. Again the population was heavily influenced by chance and thus all subjects that qualified and agreed to participate was included during the duration of the study. This lack of controlled randomization may have had some statistical ramifications. However, since the researcher's main objective was to compile a descriptive, population account of the areas included in the study, this risk was taken.

Definition of Terms

The terms defined below will be used throughout this paper.

Health Belief Model (HBM) - The HBM hypothesizes that health related action depends upon the simultaneous occurrence of three classes of factors. These include the existence of sufficient motivation or health concern to make health issues salient or relevant, the belief that one is susceptible or vulnerable to a serious health problem, to the sequelae of that illness, or to the condition or perceived threat, and the belief that following a particular health recommendation would be beneficial in reducing the perceived threat, at a subjectively acceptable cost (Rosenstock, Strecher, & Becker, 1988).

Perceived Susceptibility - defined by Hochbaum, Leventhal, Kegeles, and Rosenstock, during the 1950's, as a person's view of the likelihood of experiencing a potentially harmful condition (Champion, 1984).

Perceived Severity - defined by Hochbaum, Leventhal, Kegeles, and Rosenstock as being concerned with how threatening the condition is to the person (Champion, 1984).

Cues to Action – specific stimuli that are often necessary to trigger the decision-making process. These can be conceptualized as educational or mass media messages designed to raise awareness of a health threat (Petosa & Wessinger, 1990).

For the purposes of this study, alternative definitions were developed by the researcher that relate directly to this study's specific subject matter:

Perceived Susceptibility - encompassing general knowledge about transmission and prevention of HIV/AIDS and an overall view of one's belief that he or she may contract HIV/AIDS in the future.

Perceived Severity - one's own assessment of one's actions may increase his/her chance of contracting HIV/AIDS.

Cues to Action - any method of delivering HIV/AIDS prevention materials to the general public. This includes radio, TV, billboards, and print. This can also include community events and recommendations from health care providers.

Geographical Information Systems (GIS) – computer models of maps and globes along with tools to analyze them utilizing a layering method to achieve what the user wishes to display

Summary

The researcher used this study to help to understand the educational deficits that exist regarding HIV/AIDS in the department of Sonsonate, El Salvador. The health threat

of HIV/AIDS is not a new one. However, efforts need to be continued to ensure that this deadly and life-changing disease is well understood and that prevention and protection measures are also well understood. By utilizing various methods and approaches to reporting data, the researcher attempted to uncover specific geographic areas as well as specific areas of needed educational efforts in regards to HIV/AIDS. This study was conducted within the framework of the Health Belief Model (HBM) and every attempt was made to draw as many correlations as possible between the population and specific areas of the model. Geographic Information Systems (GIS) was also utilized with this study to provide a graphical representation of the results. By using various methods of reporting, the results of this study will hopefully clearly depict the objectives and also an accurate representation of the population within this area. It is the hope of the researcher that the results from this study may be used to target particular populations and act as a spring board for tailored educational efforts in an attempt to reduce incidence and prevalence rates HIV/AIDS in Sonsonate, El Salvador.

Chapter 2

Review of the Literature

Introduction

The demographic makeup of El Salvador contributes to the problems that combat attempts at educating the population about HIV/AIDS prevention. Despite a relatively small landmass, 8,124 square miles, stretched out over 14 departments, the population of El Salvador is widely dispersed throughout it (National Program of STDs, 2007b; *The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006). The outlying areas are the ones that maintain 40% of the population or 2.8 million people with the urban centers boasting the other 60% or approximately 4 million people (National Program of STDs, 2007b; *The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006).

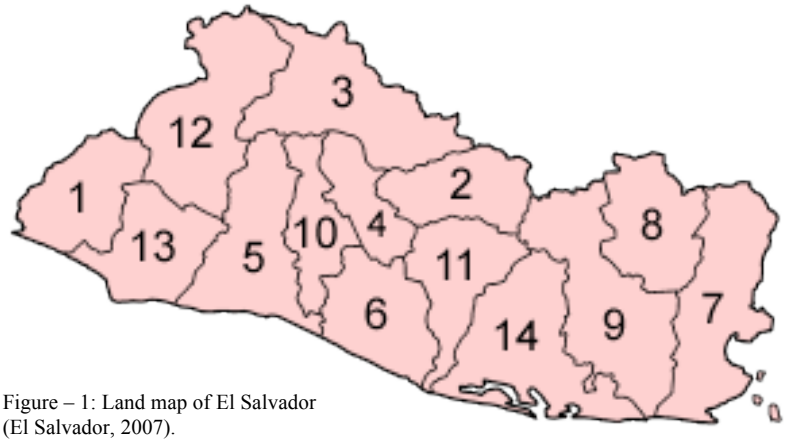

Figure – 1: Land map of El Salvador (El Salvador, 2007).

1. Ahuachapan
2. Cabanas
3. Chalatenango
4. Cuscatlan
5. La Libertad
6. La Paz
7. La Union
8. Morazan
9. San Miguel
10. San Salvador
11. San Vicente
12. Santa Ana
13. Sonsonate
14. Usulutan

The areas outlying the main city centers encompass a stark contrast to the very modern and western locales of the cities. The terrain can range from coastland to mountains while modernization also ranges from relatively equivalent to western society all the way to extremely primitive conditions without running water or indoor plumbing. With a general population calculation of 58% of El Salvadorians living below the poverty line, with less

than $2 USD per day, low income and poverty-stricken areas can be found almost anywhere throughout the country (Guerrero & Mendizabal; National Program of STDs, 2007b).

The purpose of this chapter is to review the current literature concerning the educational effort modalities that are used to combat HIV/AIDS around the world and in El Salvador. A brief overview of El Salvador's health care system will be presented first. Next, the most recent and historic efforts by the Ministry of Health in El Salvador in response to HIV/AIDS will be discussed. Then, a review of how mass media has been used around the world to help with HIV/AIDS education will be presented. Next, a summary of various educational efforts targeted at HIV/AIDS will be discussed. Then, a review of multiple educational models, Social Cognitive Theory (SCT), Theory of Reasoned Action (TRA), and the Health Belief Model (HBM), will be presented with a historic account of how each originated and how each is used to predict behavior. Finally, a special emphasis review of the Health Belief Model (HBM) will be presented next to include the early efforts of validation and the use of the HBM specifically in the HIV/AIDS effort. The proposed contribution this study will make to the current literature will be addressed at the conclusion of this chapter.

The Health Care System in El Salvador

Health care availability in El Salvador is provided via three principal health systems; the Ministry of Public Health and Social Welfare (MOPHSW) (Ministerio de Salud Pública y Asistencia Social), the Social Security Institute (Instituto Salvadoreno del Seguro Social), and and the private or fee-for-service system. Nearly 80% of the population depends on the MOPHSW system for government, subsidized care that is

provided to all citizens regardless of their ability to pay. This encompasses a system of clinics and hospitals throughout the country. Within the MOPHSW system, Hospital Rosales, located in the capital of San Salvador, provides the bulk of HIV/AIDS treatment. Approximately 17% of the population, consisting predominantly of the working class, receives their health care via the Social Security Institute. The other 3% of the population consist of those that can afford to visit private hospitals and offices that use a fee-for-service billing (Vazquez et al., 2003).

El Salvador's Response to HIV/AIDS

El Salvador's effort to combat and slow the progression of HIV/AIDS has strengthened since the onset of cases in the 1980's. While initial HIV/AIDS prevention activities started as early as 1988, El Salvador was the last country in the region to pass legislation protecting patient rights and guaranteeing access to treatment, which occurred in 2001. The National AIDS Program was established in 1989 and it works closely with several ministries, non-governmental organizations (NGOs), and civil societies to raise awareness and promote prevention programs (USAID, 2004). National efforts to combat HIV/AIDS come in various forms in El Salvador. Several strategic plans have been put into action over the years with the most recent one initiated in 2005. This plan has a wide range of focuses. Human rights, gender equality, acquisition of knowledge, strengthening of preventive and protective measures, and extending coverage of services to vulnerable populations are some of these efforts to guide the national response to HIV/AIDS over 5 years (2005-2010). In addition, the National Commission Against AIDS (CONASIDA) was formed in 2004 consisting of various subcommittees that focus on protecting the human rights of persons living with HIV and to monitor and evaluate different aspects of

the HIV/AIDS epidemic and the national response to it (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006).

Various campaigns and programs have been utilized in El Salvador. Even though predominantly concentrated in the urban areas, these campaigns/programs demonstrate the concern and attention that HIV/AIDS is receiving at the governmental level. One strategic and targeted campaign focused on preventing HIV transmission from mother to child. This effort was launched in 2001, and included billboards, posters, articles, and TV public service announcements as a means to educate mothers about the importance of knowing their HIV status. In addition to the advertisements, HIV testing, baby clothes, anti-retroviral therapy, pre and post delivery care, and formula were all offered to mothers as a free service (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006).

"If you are expecting . . . . . don't expect more . . . .insist on controlling you pregnancy" (Si está esperando . . .no esperás más . . .Inicia ya tu control de embarazo).

Figure – 2: Brochure for campaign to educate about mother to child transmission (*The Fight Against AIDS in El Salvador, A Commitment of a Nation,* 2006).

Other programs targeting specific populations of people have included education efforts among high risk populations such as migrant workers, men who have sex with men (MSM), and commercial sex workers (CSW) (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006).

To date, several massive media campaigns have also been initiated to raise awareness and to promote healthy sexual behaviors. These campaigns have proven to be the most costly of any other effort by the El Salvadorian government in the fight against HIV/AIDS. In September 2005, El Salvador launched its largest expenditure in history in the fight against a disease, costing more than $800,000, with a campaign "Win The AIDS Battle" (Ganale la batella al SIDA) (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006). The target audience for this campaign was adolescents, since this group has the highest prevalence of infection. Slogans such as "Think, control, faithful, protect from AIDS" (Piensa controlate se fiel protegete del SIDA) and "At the party you can win the battle against AIDS" (En la fiesta . . . Tu puedes ganarle la batalla al SIDA) began showing up on billboards, public transportation, cinemas, restaurants,

bars, and night-clubs depicting teenagers in everyday situations and focusing its messages around the central themes of delaying the first sexual contact, mutual fidelity, self-control, and the importance of protection. Another focused effort towards the adolescent population conveyed that to maintain a 100% avoidance of HIV and exercise a responsible sexuality one should "Decide to wait" (Decidete a esperar).

Figure – 3: Brochure Decide to Wait (*The Fight Against AIDS in El Salvador, A Commitment of a Nation,* 2006).

Recognition of the existing stigma also did not go unnoticed and the government launched the campaign "Unite Against Discrimination" (Unamonos Contra la Discriminación) in 2006 (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006).

Throughout the literature on El Salvador and its fight against HIV/AIDS several recommendations for future programs have been made. After presenting an overview of their entire effort against HIV, the Ministry of Health states that a stronger focus should be placed on widespread dissemination of information to a larger section of the

population and to vulnerable populations (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006). Another study, from the Pan American Journal of Public Health, proposes that future studies should aim to gather more data on health-seeking behaviors as information on knowledge and AIDS related behaviors has been shown to uncover populations at risk and allows a means to monitor a population over time for effects of prevention efforts (Vazquez et al., 2003). The gathering of information related to the behavioral patterns that put someone at risk for contracting HIV will provide the framework for future programs that target populations in areas where gaps in knowledge exist. To date, no studies were identified that studied the behavior patterns related to HIV/AIDS knowledge and prevention in El Salvador.

The Role of Mass Media in HIV/AIDS Education

The media has been used to promote HIV/AIDS prevention in developing countries almost since its discovery in the early 1980's. Mass media interventions are defined as any programs or other planned efforts that disseminate messages to produce awareness or behavior change among an intended population through channels that reach a broad audience. These channels include radio, TV, video, print, and the internet and can take different forms such as radio variety shows, songs, spots, soap operas, music videos, films, pamphlets, billboards, posters and interactive web sites (Bertrand, O'Reilly, Denison, Anhang, & Sweat, 2006). Through the years, various methods of utilizing the media have been proposed. Entertainment education (E-E) is a strategy utilizing an intentional incorporation of educational messages into an entertainment program to increase audience members' knowledge about a social issue, create more favorable attitudes, and change their overt behaviors regarding the social issue (Karlyn, 2001;

Vaughan, Rogers, Singhal, & Swalehe, 2000). Entertainment-education strategy is based on Bandura's social cognitive theory which suggests that individuals learn new behaviors by observing and imitating the behavior of admired others, or role models. Bandura posited that individuals might increase their self-efficacy, that is, their perceived ability to carry out a specific task, by observing role models successfully perform that task. For example, a viewer who observed a television character, with whom they identified closely, go for an HIV test may feel that he/she is able to obtain an HIV test. Studies have found that involvement with characters in dramatic entertainment-education programs leads to positive behavior change (Sood, Shefner-Rogers, & Sengupta, 2006).

Support for use of the media is strong and documented correlations exist linking the effects of media and behavioral change. As Singhal and Rogers point out, over the past two decades, mass media-based entertainment education campaigns have been used effectively to influence awareness, knowledge, attitudes, and practices regarding various public health issues (Sood et al., 2006). Mass media messages about HIV/AIDS prevention have been associated with correct conceptions about the modes of HIV transmission. Scholars argued that strategically designed mass media messages could serve as precursors to behavior change. The role of interpersonal communication in social networks serves as an antecedent to changing health behaviors. Recent literature suggests that mass media generated interpersonal communication contributed to the reach and effectiveness of health promotion campaigns (Sood et al., 2006). Despite the growing positive support, controversy remains regarding the effectiveness of mass media public health campaigns in relation to producing healthier behaviors. As one author put it, "It is important to empirically investigate the potential pathways through which mass media

can influence behavior. This empirical type of investigation can add weight to or detract from the argument that mass media public health campaigns are effective in changing behavior" (Agha, 2003). The use of this tool offers a powerful avenue to reach large numbers of people. As with any tool, the media should be used efficiently. Program development should aim at targeting specific populations and evaluation of such programs should be ongoing.

The efforts of extensive media campaigns on HIV/AIDS prevention, has shown various results. One criticism of evaluating mass media campaigns has rested on issues of selection bias, recall bias, and no ability to incorporate randomized control study designs due to the saturation of such media as radio and TV (Hutchinson & Wheeler, 2006; Keating, Meekers, & Adewuyi, 2006). A study in the early 1990's attempted to dispel some of these concerns. This was the first field experiment design for evaluating a mass media HIV/AIDS prevention campaign at the national level among a general population when published in 2000. It evaluated the respondents' knowledge, attitudes, and practice of HIV prevention behaviors. The study displayed that a radio soap opera stimulated adoption of HIV/AIDS prevention behaviors in the treatment area of Tanzania from 1993 to 1995 and then throughout the study area from 1995 to 1997. It showed statistically significant decreases in the number of sexual partners for both men and women during the 1993 to 1995 experiment, which were then replicated in the comparison area after 1995. Statistically significant increases in the number of sexually active respondents with more than one sex partner who report that they were current users of condoms during the 1993 to 1995 experiment. Similar findings were matched with cross-sectional analyses from a national survey and the reports from listeners in interviews. This study also

demonstrated a high external and internal validity by triangulating data from independent sources combined with field experiments (Vaughan et al., 2000).

Other studies on condom use in Tanzania and Uganda have shown that exposure to media increased condom use secondary to radio soap opera exposure. A TV drama in Cote d'Ivoire found that men and women with heavy program exposure were more likely to have used a condom at their last sexual encounter than those with no exposure. Women and men who reported being exposed to messages in the mass media were at least twice as likely as those with no exposure to know of condoms as a means to avoid HIV/AIDS (Bessinger, Katende, & Gupta, 2004). Knowledge of transmission routes and prevention methods against HIV/AIDS as well as improved attitudes toward the disease have also been attributed to exposure to media campaigns. Schlemmer reports in one study evaluating the South African TV drama, Soul City, that respondents spontaneously mentioned the drama most frequently as their source of information about AIDS on television and radio (Goldstein, Usdin, Scheepers, & Japhet, 2005). Other studies conducted in North India, Kenya, Nigeria, and Senegal all evaluated the link between exposure of media messages and subsequent increases in knowledge, awareness, and attitudes toward HIV/AIDS (Agha, 2003; Keating et al., 2006; Lagarde, Pison, & Enel, 1998; Sood et al., 2006). In the Kenyan study, respondents with high exposure to the campaign were 1.5 times as likely as those not exposed to be aware of the risk of AIDS in their community and have a higher likelihood to report AIDS as a serious problem (Agha, 2003). Other studies have also demonstrated a dose-response effect to levels of exposure and increases in knowledge of behavioral change, suggesting that campaigns using

multiple media channels may be most effective in improving sexual health knowledge (Babalola & Vonrasek, 2005; Bertrand et al., 2006; Bessinger et al., 2004).

All studies have not been successes, inability to find a correlation between media exposure and knowledge and awareness increases have also been reported. A study in Zambia did not find a change in general AIDS knowledge and condom use that could be attributed to exposure to their radio drama (Bessinger et al., 2004). Also, in Cameroon, no evidence was found in increases in condom use for sexually transmitted infection (STI) prevention among youths exposed to a social marketing campaign (Bessinger et al., 2004). A study evaluating a targeted radio campaign towards "high risk" populations in Mozambique found that recall of specific messages in specific risk groups was low. However, a multivariate model demonstrates that among those exposed to the radio campaign, 97.2% reported intent to change their sexual behavior compared with 62.8% of those not exposed to the campaign. This study illustrates the difficulties in using radio to target a specific group with a corresponding behavior change message (Karlyn, 2001).

Limitations of media campaigns have resulted in the inability to acquire a true control group due to the nature of media campaigns and the avenues utilized to deliver them. Another limitation is the inability to draw direct causation due to data collection by self-recall (Bessinger et al., 2004; Karlyn, 2001).

Other HIV/AIDS Education Efforts

Aside from media based efforts, countless community-based programs have been initiated in many HIV/AIDS affected countries in an attempt to curb the increasing rates of infection. The desire of these programs has largely been geared towards analyzing behavioral patterns and then implementing programs to facilitate the desired behavioral

change. Behavioral studies have consistently found that knowledge about the causes, consequences, and methods of prevention of HIV infection is necessary but insufficient to stimulate behavior change (Vaughan et al., 2000). Empirical findings suggest that HIV/AIDS prevention programs that emphasize social cognitive dimensions, rather than just informational aspects, should be more effective in achieving behavioral change. Cognitive models, such as the health belief model have been found to be highly relevant in explaining HIV prevention behavior (Vaughan et al., 2000). A good argument towards the continual diligence towards theses programs was demonstrated in a study that suggests that adolescents with less knowledge about AIDS, irrespective of ethnic group status, are more likely to perceive themselves at high risk for contracting the disease (DiClemente, Boyer, & Morales, 1988). Another finding strengthens this position further, it showed that adolescents who participated in an intensive 9-session AIDS prevention program showed that discussion groups produced a long-term increase in knowledge about AIDS and higher reported intentions to cope with AIDS-risk situations (Slonim-Nevo, Auslander, Ozawa, & Jung, 1996). A study in Zimbabwe produced similar results, showing that carefully focused, small group, face to face, participative, HIV prevention counseling sessions are likely to alter adolescents' perceptions of normative support for condom use (Wilson & Lavelle, 1992). In an evaluation of the South African TV drama, Soul City, it was shown that its model combined steps to behavior change, ideas from DiClemente's behavior change model, elements of the diffusion of innovation, and components from Bandura's social learning theory to demonstrate a link between individuals, their immediate community, and the greater sociopolitical environment (Goldstein et al., 2005).

Learning Theories

Several theories have been documented that describe human behavior related to health and illness. Some examples include the Social Cognitive Theory (SCT), which originated in 1962, the Theory of Reasoned Action (TRA), which originated in 1967, and the Health Belief Model (HBM), which originated in the 1950's (Glanz, Rimer, & Lewis, 2002).

These models reflected a confluence of learning theories derived from one or both of two major sources: Stimulus response (SR) theory and Cognitive theory (Glanz et al., 2002). SR theory itself represents a marriage of classical conditioning and instrumental conditioning theories and it stipulates that learning results from events and reinforcements, which reduce physiological drives that activate behavior. Stimulus response theory also addresses the use of punishments. In this case, behavior that avoids punishment is learned because it reduces the tension set up by the punishment. Skinner formulated the widely accepted hypothesis that the frequency of a behavior is determined by its consequences or reinforcements. Skinner also hypothesized that the more temporal association between a behavior and an immediately following reward is sufficient to increase the probability that the behavior will be repeated. Such behaviors are termed operants; they operate on the environment to bring about changes resulting in reward or reinforcement. In this view, no mentalistic concepts such as "reasoning" or "thinking" are required to explain behavior. While Skinner does not deny the existence of the mind, he believes that behavioral response can be fully explained by reinforcement contingencies alone (Glanz et al., 2002). Cognitive theorists emphasize the role of subjective hypotheses or expectations held by the subject. Within the context of this theory,

behavior is a function of the subjective value of an outcome and of the subjective probability or expectation that a particular action will achieve that outcome. Such formulations are generally termed "value-expectancy" theories (Glanz et al., 2002). Reinforcements, or consequences of behavior, are believed to operate by influencing expectations regarding the situation. The Social Learning Theory (SLT) of Rotter and Bandura is derived from these views and holds that behavior is determined by expectancies and incentives (Rosenstock et al., 1988). Expectancies are composed of environmental cues, consequences of one's own actions (outcome expectation), and one's own competence to perform the behavior needed to influence outcomes (efficacy expectation). The incentives (reinforcement) are defined as the value of a particular object or outcome. Outcomes may be internal perceptions such as health status, physical appearance, approval of others, or external perceptions such as economic gain, or other consequences. Behavior is regulated by its consequences but only as those consequences are interpreted and understood by the individual (Rosenstock et al., 1988).

The Health Belief Model (HBM)

The Health Belief Model (HBM) was originally developed to help explain why people fail to participate in programs designed to prevent and to detect disease (Janz, Champion, & Strecher, 2002). This model emerged from efforts to explain and modify behaviors. One of the first major studies using the HBM was completed by Hochbaum to identify factors related to decisions by 1200 subjects to have chest x-rays for the detection of TB (Champion, 1984). The HBM hypothesizes that health related action depends upon the simultaneous occurrence of three classes of factors. These include the existence of sufficient motivation or health concern to make health issues salient or

relevant, the belief that one is susceptible or vulnerable to a serious health problem, to the sequelae of that illness, or to the condition or perceived threat, and the belief that following a particular health recommendation would be beneficial in reducing the perceived threat, at a subjectively acceptable cost (Rosenstock et al., 1988).

Another component that broadened the HBM theory, in 1988, was a component focused on self-efficacy. Simply stated, self-efficacy is one's own belief that an individual is capable accomplishing a particular behavior (Champion, 1984; Harrison, Mullen, & Green, 1992; Rosenstock et al., 1988). According to Bandura, self-efficacy is believed to be situation specific-focused on beliefs about one's personal abilities in specific settings. As Bandura puts it, "convictions that outcomes are determined by one's own actions can have any number of effects on self-efficacy and behavior. People who regard outcomes as personally determined but who lack the requisite skills would experience low self-efficacy and view activities with a sense of futility" (Rosenstock et al., 1988). For behavior change to succeed, people must have an incentive to take action, feel threatened by their current behavioral patterns, and believe that change of a specific kind will be beneficial by resulting in a valued outcome at acceptable cost, but they must also feel themselves competent to implement that change (Rosenstock et al., 1988).

The HBM then incorporates several key constructs in its attempt to explain behavior. These constructs are derived from psychological theory that hypothesizes that behavior is a function of two factors: the value an individual places on a goal, in this case health, and the individual's belief that specific actions will achieve that goal (Petosa & Wessinger, 1990). The HBM hypothesizes that a decision to undertake a health action will not be made unless the individual is psychologically ready to take action relative to a

particular health threat or condition (Cummings, Jette, & Rosenstock, 1978). This readiness to act is based on several factors. It encompasses the individual's perception of his or her own susceptibility to the condition, the severity of the condition, the belief that behaviors exist that would be beneficial in reducing susceptibility to the condition, and that the barriers, whether they be financial, physical, or emotional are less beneficial than engaging in the behavior to lessen the likelihood of the condition (Adih & Alexander, 1999; Cummings et al., 1978; Eisen, Zellman, & McAlister, 1990; Harrison et al., 1992; Petosa & Wessinger, 1990). The HBM also encompasses certain "cues to action," or specific stimuli that are often necessary to trigger the decision-making process. These "cues to action" can be conceptualized as educational or mass media messages designed to raise awareness of a health threat (Petosa & Wessinger, 1990). Each component of the HBM is theoretically modifiable using traditional health education strategies. The original formulation was oriented solely toward the desire to avoid a specific disease threat. This approach has been reformulated and expanded to include a dimension of general health motivation. The health motivation dimension was added to represent relatively non-specific and stable differences in individuals' health interests as well as perceptions of control over health matters (Cummings et al., 1978).

The Health Belief Model (HBM) was used as the framework of this study because it incorporates all the necessary components to adequately appraise a program such as a national health promotion campaign. The analysis consisting of monitoring cues to action is a perfect fit for addressing media campaigns. These programs serve as comprehensive cues to action in reaching the target population. This is precisely why the HBM is such a

good fit for analysis of national media efforts at education because it encompasses the idea of cues to action along the continuum of behavior change.

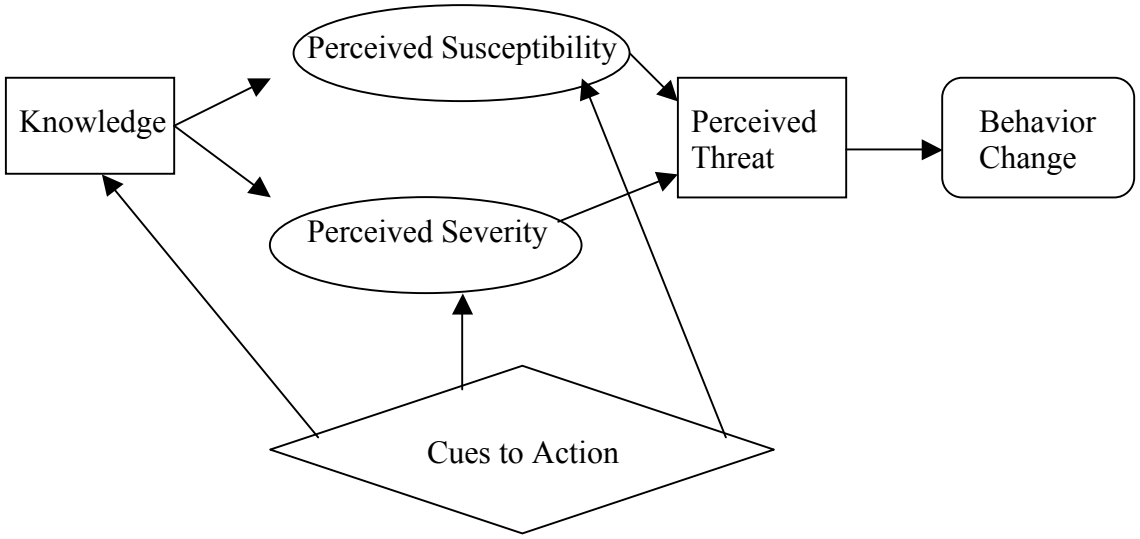

Figure 4: Diagram of Health Belief Model (HBM)

For this study, the Health Belief Model (HBM) diagram was modified to include components specific to this study.

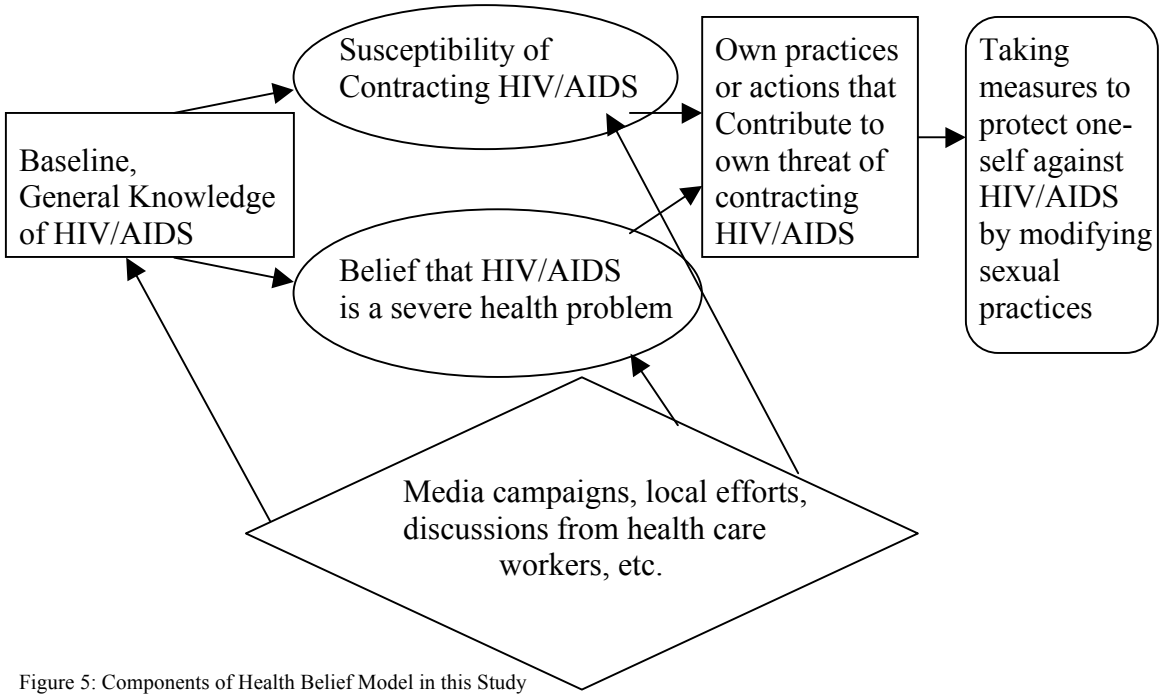

Figure 5: Components of Health Belief Model in this Study

Components that were evaluated through this study were the ideas of perceived susceptibility, perceived severity, and how cues to action (ie media campaigns and national education efforts) have impacted these ideas in the area of Sonsanate, El Salvador. Perceived susceptibility has been classically defined by Hochbaum, Leventhal, Kegeles, and Rosenstock, during the 1950's, as a person's view of the likelihood of experiencing a potentially harmful condition (Champion, 1984). Perceived severity was defined by Hochbaum, Leventhal, Kegeles, and Rosenstock as being concerned with how threatening the condition is to the person (Champion, 1984). For the purposes of this study, alternative definitions were developed by the researcher that relate directly to this study's specific subject matter:

Perceived susceptibility was defined as encompassing general knowledge about transmission/prevention of HIV/AIDS and an overall view of one's belief that he or she may contract HIV/AIDS in the future. Perceived severity was defined as one's own assessment of one's actions and how that may increase his/her chance of contracting HIV/AIDS. Cues-to-action was defined as any method of delivering HIV/AIDS prevention materials to the general public. This included radio, TV, billboards, and print. This also included community events and recommendations from health care providers.

Validating the Health Belief Model

Despite its legacy as a gold standard, the validation and reliability of the HBM remains in question. Because it was developed as an educational tool, to assess perceptions of health, it has not undergone all the rigors of instrument validation, which is typically part of scientific research. Research done on the HBM has expressed concern

about the lack of development of measurement scales that meet criteria for reliability and about the absence of data relating to relationships among the belief dimensions (Maiman, Becker, Kirscht, Haefner, & Drachman, 1977). Green states that the HBM is, “the most documented set of health beliefs,” but nonetheless it is, “ . . . almost totally without standardization, tests of reliability or of validity” (Maiman et al., 1977). In 1978, further scrutiny of the HBM and its lack of validation, led to the statement that concepts with validated measures advance science whereas concepts without validated measures provide, at best, a way of viewing a domain. Another author stated, “measures, in the absence of articulated concepts, are empty” (Cummings et al., 1978). The need to validate the HBM gained awareness and efforts emerged to determine ways to test for reliability and validity (Champion, 1984). At this point, reliability had been studied but validity in relation to the measurement of its component beliefs was still relatively untouched. In the absence of a demonstration of the ability to validly measure the constructs included in the HBM, the practical utility of the formulation was reduced. An investigation of construct validity depends on both: a network of relationships among a set of observed measures and a series of theoretical assumptions about the relationships of an asset of hypothetical constructs to one another and to the observed measure (Cummings et al., 1978). At this time, few attempts had been made to obtain direct estimates of construct validity. Campbell and Fiske (1978) argued that evidence for construct validity exists when there is convergence between independent measures of the same trait and discrimination between measures of different traits. They showed that it is possible to examine convergence and divergence within a matrix of inter-correlations of two or more theoretically unrelated traits measured by two or more independent methods.

Although the Campbell and Fiske approach represented an important advance at the time, it was unable to provide precise estimates of construct validity (Cummings et al., 1978). A new structural equation approach emerged in which Joreskog developed a powerful maximum likelihood technique which partitions the variance of a measure into three portions; valid variance, reflecting what the measure is intended to measure; correlated error variance, reflecting influences other than those the measure was designed to tap which also affect other measures; and residual variance, variance which is not otherwise accounted for, were all incorporated to address validity (Cummings et al., 1978).

This study design observed how various data collection methods contribute to validity. The original components of the HBM can be measured with substantial validity using questionnaire or interview items. Also, the seven-point Likert scale and the multiple choice method both produce valid results, with the Likert scale showing some superiority. This approach has the advantage of providing the researcher with precise, easily interpretable quantitative estimates of a measure's valid, correlated, and residual variance (Cummings et al., 1978).

In 1984, Champion chose to tackle this argument and propose means to produce valid and reliable instruments to be used when the HBM is incorporated into an evaluation (Champion, 1984). Reliability, validity, and measures of error were all addressed. Reliability hinges on the measurement of error. Reliability is a form of measurement for random errors. For an instrument to have high reliability, the corresponding random error is small. Several methods exist to measure error. Error based sampling of total content, measured using an internal consistency coefficient, coefficient alpha, which can provide an excellent measure of internal consistency and error over time

can be measured by correlating parallel forms of a test given approximately two weeks apart or by using a test-retest correlation, both of which determines equivalence (Champion, 1984).

Validity was also addressed since it must be established before the instrument is useful. Validity pertains to the degree to which an instrument measures what it is supposed to measure. Three types: criterion, content, and construct validity exist. Criterion validity involves correlating responses to an instrument against that of an external criterion. In this type, validity is shown by a degree of correlation between a measure and a criteria. Content validity addresses adequacy of sampling content. Kerlinger states that content validity was representative of instrument content as it relates to the domain. Content validation consists of expert judgment in which the property being measured is judged for relevance. Construct validity is characterized by its relationship to and dependence on theory. If a measurement has construct validity, it represents the constructs as theoretically specified. Factor analysis is a powerful tool for construct validity because it helps determine the internal structure and cross structure of a set of variables. If the factors correspond to the theoretical structure, then construct validity is evidenced (Champion, 1984).

More recently, Harrison commented on analysis of validity in regards to the use of the HBM. To assess perceived validity, it is required that each study relate the HBM to a health behavior (Harrison et al., 1992). Others have postulated as to acceptable methods to gain validity. Janz and Becker assessed the predictive power of the HBM by calculating ‘significance ratios’ ie dividing the significant positive findings by the total number of findings (Harrison et al., 1992). Rosenthal (1984) demonstrated that the

Pearson product moment correlation (r) can be used as a common estimate of effect size (the magnitude of a relationship) and gave formulae for converting other statistical results to *r*. Janz and Becker (1984) also found that the HBM was significantly related to health behaviors by showing that significant positive relationships between HBM dimensions and health behaviors exist (Harrison et al., 1992). Therefore, despite some past controversy and question in regards to reliability and validity, the HBM remains a solid framework to study health behaviors.

The Health Belief Model and HIV/AIDS

This HBM framework is very conducive to analyzing the health behaviors surrounding HIV/AIDS. The use of the HBM in the study of HIV/AIDS prevention programs has been well documented. Numerous studies were identified that incorporated the HBM in relation to HIV/AIDS prevention strategies all over the world (Adih & Alexander, 1999; Koopman, Rotherman-Borus, Henderson, Bradley, & Hunter, 1990; Petosa & Wessinger, 1990; Slonim-Nevo & Mukuka, 2005; Vaughan et al., 2000; Volk & Koopman, 2001; Wilson & Lavelle, 1992). Results of studies utilizing the HBM in HIV/AIDS prevention programs were mostly supportive, showing positive correlation between the HBM constructs and preventive HIV/AIDS health behaviors. A study in Tanzania supported the HBM design. Its results strengthened the HBM design by demonstrating positive relationships between self-efficacy beliefs about control of one's sexual behavior, interpersonal communication about condom use with sexual partners or opinion leaders, feelings of personal susceptibility to HIV/AIDS, belief in the efficacy of preventive behaviors, perceived social norms with respect to preventive behaviors, and perceived barriers to the adoption of HIV preventive behaviors. Its authors go on to say

that by incorporating a cognitive model rather than merely an informational one, relevant assumptions can be made in explaining HIV prevention behavior (Vaughan et al., 2000). Emmons, in 1986, reported that AIDS knowledge, perceived susceptibility, perceived efficacy of preventive behavior, barriers to action and perceived social norms predicted HIV preventive practices in a cross sectional study of 909 homosexuals in Chicago (Wilson & Lavelle, 1992). In a survey of 1072 random digit dialed adults in Montreal, Allard (1989) reported that beliefs concerning the susceptibility, severity and efficacy of solutions to AIDS predicted HIV preventive steps (Wilson & Lavelle, 1992). Another study, in Zimbabwe, found that barriers to action were the most consistently significant predictor of health behavior, followed by effective solutions, susceptibility, then severity of threat of infection (Wilson & Lavelle, 1992). Hingsone found that, in western studies of the HBM, facilitating cues and the absence of barriers to action have emerged as major predictors of HIV preventive behavior (Wilson & Lavelle, 1992). A team of researchers conducted a study of women from an urban area in the US and found that personal susceptibility was reliably associated with several protective behaviors for HIV (Volk & Koopman, 2001). A study conducted in Kenya specifically tested HBM constructs in relation to condom use and found that the components of the HBM that are the most related to HIV risk behavior vary by community and probably even by age and possibly by other group characteristics (Volk & Koopman, 2001).

However, negative correlations were also demonstrated. One such study took place in Ghana and addressed condom use among adolescents. It incorporated such HBM constructs as perceived susceptibility, perceived self-efficacy, and perceived barriers but showed that these did not directly influence condom use at last intercourse (Adih &

Alexander, 1999). Another study found that greater perceived susceptibility was associated with higher risk sexual behavior. In essence, people sometimes are more likely to perceive themselves to be at risk for HIV infection when they engage in high-risk sexual activity (Volk & Koopman, 2001).

Even though a significant body of research exists utilizing the HBM in relation to HIV/AIDS prevention programs, research suggests further studies will help groups learn so that programs can be developed that target populations with lower awareness levels. Especially in cross-cultural situations, such as Latin America, more comprehensive research needs to be conducted so that future programs for HIV/AIDS prevention can be more effective. Most analytical research on the effects of the HBM and its principles on the learning and knowledge about HIV/AIDS has been conducted in the United States and in Africa. The HBM has both intuitive as well as practical importance in the study of health behaviors.

Even though international donor agencies and governments have invested millions of dollars in different types of communication interventions in developing countries, relatively few have been subjected to any type of rigorous evaluation to date (Bertrand et al., 2006). Many of the classical approaches to evaluation may not be effective models for this type of program. The classic, scientific theory model identifies a research problem and recommends a randomized, controlled study design to ensure limited bias and optimizes the scientific method. However, to effectively evaluate a program such as nationally delivered media campaigns, a researcher can in no way utilize the classic randomized control design. The structure of the program under investigation has limitations within the construct of the pure scientific model. Hornik's *Public Health*

Communication, Evidence for Behavior Change, details the importance of using other study designs besides randomized trials when evaluating full coverage media campaigns. The fact remains that it is not viable to assign subjects randomly to treatment groups when the intervention consists of full coverage programs aiming to reach the largest possible audience, which is the case with national AIDS prevention programs in most countries (Bertrand et al., 2006). Since randomized control designs are not feasible with this type of program, other evaluation designs must be used instead. One frequently used alternative for measuring effects is to compare outcomes by level of exposure, also known as dose response analysis. If using this approach, you must control for socio-demographic factors or access to media. For example, a strong association between levels of exposure and behavior change may merely reflect the effect of education and urbanization on both variables. To address this bias, researchers often control for socio-economic status and access to media. This does not resolve the issue of reverse causality, that people already doing the behavior may be more attentive to the messages about it (Bertrand et al., 2006). Such research will be of greatest benefit to program managers if it includes detailed descriptions of the interventions under study, including media channels, main messages, duration, reach, frequency and underlying theoretical principles (Bertrand et al., 2006). An accurate assessment of the effects of such programs is vital information for the development of any future programs.

By continually adapting and improving instruments and methods used in evaluating the HBM and its relation to HIV/AIDS knowledge and prevention and by having predictive validity, then experimental studies about people's beliefs relating to health behavior in relation to HIV/AIDS prevention and otherwise would enable the

design of interventions where changing beliefs would be one component in an overall intervention strategy (Harrison et al., 1992).

Contribution of the Study

Extensive efforts to educate vulnerable populations about the dangers and risks associated with HIV/AIDS are well documented. While programs have been conducted in almost every avenue thinkable, the effort to evaluate the effects these programs have on the public awareness and impact on behavioral change remains difficult to assess. Especially in the region of Latin America, very little evidence exists on the effects of the overall educational efforts on behavioral change and their impact on infection rates. This study contributes to the literature by independently analyzing the general public's knowledge of HIV/AIDS, their perceived susceptibility, their perceived severity, and their level of behavioral change and comparing that data with that of the health care community and with reported, epidemiological data of incidence and prevalence for six cities in Sonsonate, El Salvador. The impact will be addressed on a level that has not been reached to date. This study will help facilitate the development of future efforts to address deficiencies in knowledge, awareness, and prevention of HIV/AIDS so that future efforts will be more targeted and create a higher level of behavioral change.

Chapter 3

Methods

Introduction

This chapter will provide a clear and thorough explanation about the entire study design and the methods with which the researcher carried them to completion. A review of this study's research questions will be revisited first. Next, a brief explanation of the research methodology will lead into a more thorough discussion of the research design for this study. Then, a detailed account of the study population along with the actual sample will be presented. A discussion of the instrument questionnaire will be explained along with the methods used to ensure reliability and validity within the study will be presented next. Finally, a review of the statistical methods will ensue along with an overall summary of the methodology used throughout the duration of this study.

Research Questions Specific to the Study

The following is a list of research objectives that will be addressed throughout this study.

1. What was the current knowledge level of HIV/AIDS causes, prevention, and transmission among a population ranging from 15-39 and a population of physicians in six cities throughout Sonsonate, El Salvador?
2. How did the measure of perceived risk, perceived susceptibility, and participation in risky behaviors relate to each other and to knowledge level for a population aged 15 – 39 in the target area?
3. Where were the areas that have significant knowledge, perception, or behavioral deficits regarding HIV/AIDS within the target population?

Methodology

This was a survey-based, quantitative study. It involved an evaluation and analysis of a population encompassing six varying geographical regions throughout the department of Sonsonate, El Salvador. This study was a one-time evaluation using a survey-questionnaire format. Responses from participants were coded to give each answer a numerical value. These responses were then tabulated using various statistical analyses to render a complete quantitative view of the gathered information.

Study Design

The design for this study was descriptive in nature. The researcher's motivation behind this choice was to design a study that would gather information about the current educational level of the target population concerning HIV/AIDS that at the time of this study was merely speculation. Several government agencies and non-governmental organizations (NGO) report vastly different numbers in regard to prevalence and incidence of HIV/AIDS throughout El Salvador. It was the researcher's thought that concrete numbers probably do not exist secondary to variances in reporting methods. Despite the varying values that are reported for the actual prevalence and incidence of HIV/AIDS cases in El Salvador, one common statistic is that the incidence continues to rise every year (National Program of STDs, 2007a). The most recent data received by the Ministry of Health's National HIV/AIDS Program in El Salvador reports that Sonsonate, part of the Occidente region of the country, produced 14% of the new HIV+ cases from January – June of 2007 (Sonsonate, 2007b). Therefore, even though many campaigns have been initiated and conducted throughout El Salvador by the Ministry of Health,

which were previously discussed, it occurred to the researcher that the educational level of this population may be lacking in the area of HIV/AIDS.

The variables that were analyzed within this study help to structure it in such a way that the most information was gathered about the population. The experimental variables can be divided into three main categories. The first category encompassed the variables within the population dealing with demographic variations and exposure to various sources of media. Dealing with a population sample such as the one in this study, with a significant n value, introduced a significant amount of demographic variability. The researcher recorded as many demographic characteristics as was considered acceptable for this study design. Demographic characteristics that were documented included: ability to read, gender, age, marital status, religion, education level, and occupation. Since many of the campaigns used for HIV/AIDS education within El Salvador utilized TV, radio, or print media, the researcher was concerned with the amount of access the participants in this study had to various types of media. Media exposure variables that were considered included: ownership of a TV, frequency of watching TV, amount of time spent watching TV, ownership of a radio, frequency of listening to the radio, and the amount of time spent listening to the radio.

Sample

As stated earlier, El Salvador contains fourteen departments. Sonsonate is located in what is considered the western part of the country. It was chosen to be the location for this study because Sonsonate has historically fallen in the top three departments as far as new and existing cases of HIV/AIDS (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006). The historic leader for new and existing cases of

HIV/AIDS in El Salvador has consistently been the department of San Salvador (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006). Since San Salvador continually has the highest numbers of cases of HIV/AIDS, the researcher felt that it was reasonable to expect that a majority of the focus for educational campaigns about HIV/AIDS was also focused in this area. Therefore a concerted look and analysis of an area outside this very urban area would add a new dimension to the already existing data on the effects of the various media campaigns. The department of Sonsonate has a total population, as of 2007, of 530,988 with approximately 45% (237,570) residing in urban areas and the other 55% (293,418) residing in rural areas (Sonsonate, 2007a). Of this total population, 63.5% (337,076) are over the age of 15 years old (Sonsonate, 2007a). Sonsonate is divided into sixteen municipalities: Acajutla, Santo Domingo de Guzmán, Santa Catarina Masahuat, Salcoatitán, Juayua, Nahuizalco, San Antonio Del Monte, Sonsonate, Nahulingo, Sonzacate, Izalco, Caluco, Cuisnahuat, Santa Isabel Ishuatán, San Julián, and Armenia (Sonsonate, 2007b). This study was conducted in six of these municipalities: Acajutla, Armenia, Nahuizalco, Nahuilingo, San Antonio Del Monte, and San Julian. The researcher picked the municipalities for this study based on multiple factors. First, the researcher wanted to conduct a study in the areas where the most new HIV/AIDS cases were being reported within Sonsonate. It was the researcher's thought that these areas were lacking somehow in proper education or the numbers of new cases would not continue to rise in those areas. The following chart shows the distribution of new HIV cases by municipality in Sonsonate from January to June 2007.

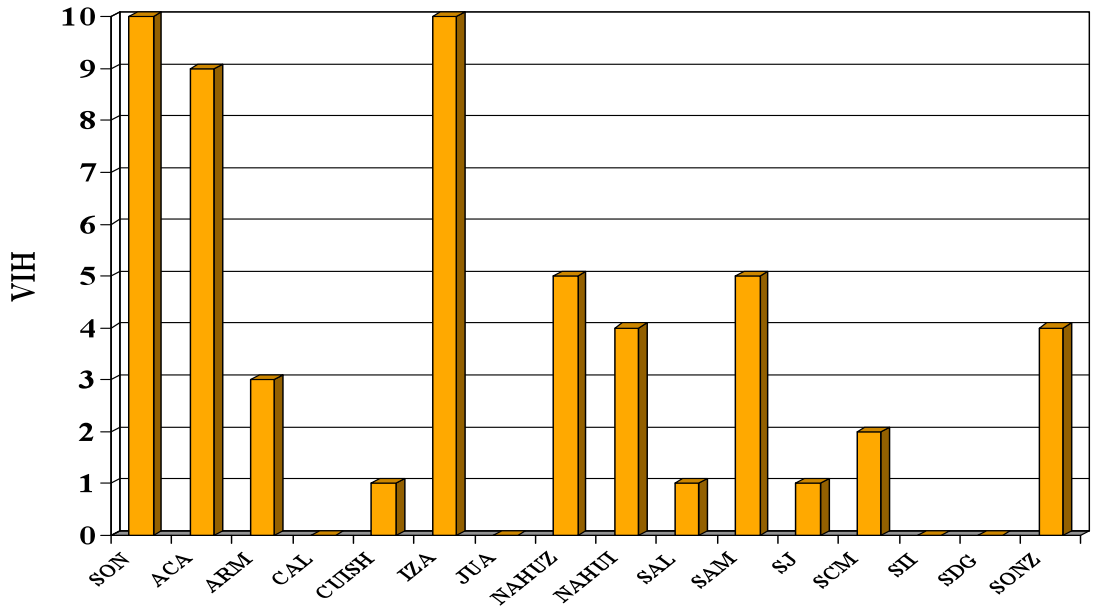

Figure 6: New HIV cases by municipality in Sonsonate: January – June 2007

The six municipalities chosen for this study fell among the highest according to the chart. Some exclusions of municipalities were made by the researcher. The municipality of Sonsonate City had the highest number of reported new cases of HIV, however, this municipality was excluded from the study because it is the largest urban center in the department of Sonsonate and the researcher wanted to conduct a study away from urban centers as much as possible. Izalco is another municipality with a high number of reported, new HIV cases, however, this municipality was also excluded from the study. This municipality was involved in a widespread Dengue Fever outbreak at the time this study was conducted and it was taking a toll on the entire health care staff for the entire municipality. Since the researcher relied upon cooperation and aid from the local health care support staff, the decision was made to exclude Izalco as a study area.

Two samples were selected for this study. One sample consisted of 15-39 year old males and females from the six municipalities or towns throughout the department of

Sonsonate, El Salvador. The age range of 15-39 was selected because it is the most highly susceptible population historically within El Salvador with up to 67% of cases occurring between these ages (USAID, 2004). The six municipalities or towns that were selected consist of Acatjutla, Armenia, Nahuizalco, Nahuilingo, San Antonio del Monte, and San Julian. The six municipalities or towns include a mix of densely populated areas and areas that are sparsely populated. The following are the projected population rates for each of the six municipalities as of 2005: Acajutla – 69,084, Armenia – 27,557, Nahuilingo – 44,321, Nahuizalco – 15,168, San Antonio Del Monte – 35,784, and San Julián – 15,678 (Sonsonate, 2007a).

The terrain of the municipalities ranges from coast-land around the municipality of Acajutla to mountainous areas surrounding the municipalities of Nahuilingo and Nahuizalco. A sample size of 1,500 individuals, approximately 250 participants from each of the six municipalities or towns was the goal for the number of participants to recruit for this study. Within each municipality or town, the research setting will be a clinic (Unidad de Salud) that is equivalent to a health department in the United States. These clinics are maintained and governed by the Ministry of Health in El Salvador. They offer many programs to people that reside in the area. These programs range from physician consultations and pre-natal care to nutritional programs and vaccination clinics for children. This site was ideal for recruiting participants for this study because it is a well-established fixture in each community and it is a place that is frequented by many members of each community for various reasons other than simply seeking medical attention. Participants were selected from each of the six municipalities or towns from the setting of the health clinics. The second sample consisted of health care providers in each

of the six municipalities or towns. Every physician that provided consultations in each of the six municipalities or towns was asked to complete the same questionnaire as the general population with the addition of six extra questions that pertain specifically to medical providers and their interactions with HIV/AIDS patients. Every attempt was made to recruit every physician that worked at each of the six health centers (Unidad de Salud) for this study.

Instrumentation

In this study, recommendations from multiple sources were implemented throughout the creation of the instrument, sampling design, and statistical analysis. Development of the instrument for this study began by a review of the literature of other studies incorporating the Health Belief Model (HBM) (Adih & Alexander, 1999; Champion, 1984; Cummings et al., 1978; DiClemente et al., 1988; Petosa & Wessinger, 1990; Sapp & Weng, 2007; Wilson & Lavelle, 1992). After a thorough literature review, some recommendations from other studies and examples of other questionnaires were reviewed and sections that fit this study were considered in the final questionnaire design for this study.

Several recommendations were found in the literature search. One recommendation pointed out the importance of assessing suspected reading level of the sample population. While the overall literacy rate in El Salvador is 84%, in the sample population the literacy rate is unknown (National Program of STDs, 2007b). Therefore, the instrument was designed to be an interview-style assessment to alleviate any discrepancy that may occur from various reading levels. Another recommendation stated that items assessing practical as well as general information must be included to ensure

that all possible relevant domains of AIDS knowledge and beliefs are assessed. Brief measures of knowledge and beliefs are unlikely to show sensitivity to treatment effects, and if knowledge items are too easy, the "ceiling effect" of high scores will limit the measure's capacity to demonstrate treatment effects. Knowledge about AIDS is rapidly changing, therefore items must be based on what is known with high confidence (Koopman et al., 1990). These concerns were addressed in the development of the instrument questions and every effort was made to alleviate items that did not adhere to these specifications.

Instrument questions were compiled completely or modified from other instruments used in various, past studies addressing HIV/AIDS (Agha, 2003; Koopman et al., 1990; Petosa & Wessinger, 1990; Wilson & Lavelle, 1992). The specifics of this study required the addition of several other original questions by the researcher as well. The final, standard instrument questionnaire consisted of four sections: HIV/AIDS knowledge, perceived severity, perceived susceptibility and behavior. An additional section for physicians was added to the questionnaire given to the physicians. An original HIV/AIDS knowledge question pool of seventy questions was developed by compiling questions used by Koopman, Petosa, and DiClemente (DiClemente et al., 1988; Koopman et al., 1990; Petosa & Wessinger, 1990). These questions were compiled from published articles that studied effects of HIV/AIDS education efforts. Upon review by the researcher, a total of twenty-six true/false questions were selected out of the original seventy questions and included in the final HIV/AIDS knowledge section. The perceived severity section of the questionnaire was composed of twelve questions consisting of true/false and Likert-style questions. Likert-scale questions have been shown to be

superior to multiple choice questions and vignette style questions when addressing components of the HBM (Cummings et al., 1978). Refer again to Figure 6. The perceived susceptibility section consisted of ten, true/false questions. The behavior change section consisted of nine true/false questions. The sample was obtained by randomly selecting participants from each of the six clinic sites on a daily basis. The participants may have been coming to the clinic for themselves or bringing someone else to the clinic. They could have been coming for a physician consult or for any other program offered by the clinic. The only requirement for participation was that the participant be between the ages of 15-39.

Validity and Reliability

To determine the validity of the instrument, several methods were incorporated. Recommendations from the literature focused on the importance of avoiding ambiguously worded items as they tend to produce invalid and unreliable responses (Koopman et al., 1990). To address this issue and also to address content validity, the instrument questions were evaluated prior to the beginning of the start of the study by two separate panels. One panel consisted of four PhD's, who are familiar with the HBM, who were given the proposed questions along with the researcher's own definition of perceived susceptibility, perceived severity, and cues to action as it related to this study. Their review of the questions was used to ensure that the focus of the questions was in alignment with the selected HBM constructs. Based on the recommendations of this panel, questions were eliminated, retained, or modified for inclusion into the final instrument. After the final assessment from this panel, a new instrument was constructed. At this time, the completed instrument was translated into Spanish. After translation, it

was sent to a second panel for review. This panel consisted of two physicians residing and practicing in El Salvador, a nursing instructor in El Salvador, and a representative from the HIV/AIDS division of the Ministry of Health in El Salvador. This panel served as this researcher's panel of experts. This panel of experts reviewed the instrument for question clarity, appropriateness, and cultural sensitivity. Questions were reviewed and changes were made based on recommendations. The final instrument consisted of thirteen demographic questions, twenty-six HIV/AIDS knowledge questions, twelve perceived severity questions, ten perceived susceptibility questions, and seven behavioral change questions. A separate section was added for any physicians that were interviewed that contained nine questions focusing on the amount of education and services offered by the health care workers to their patients in regards to HIV/AIDS.

Procedures

The idea for this study occurred to the researcher during a visit to El Salvador in 2006. The researcher was completing an elective rotation for medical school. The researcher noticed that billboards were prevalent in the city of San Salvador pertaining to HIV/AIDS, however, in areas other than San Salvador the researcher noticed much fewer billboards about HIV/AIDS. After this observation, the researcher began to wonder about the education level concerning HIV/AIDS in the outlying areas away from city centers, such as San Salvador. With the observation and idea in mind, the researcher began to search sources such as the internet for further insight into the HIV/AIDS education effort in El Salvador. After engaging in a thorough internet search, the researcher realized that for the most part any and all information pertaining to HIV/AIDS in El Salvador is varied depending on the source of the information and the majority of what could be located was

conducted in the capital city of San Salvador. This captivated the researcher and solidified the thought that any well-done and thorough study as to the education level in regard to HIV/AIDS in an area outside of San Salvador would be virtually uncontested in the literature.

On the original visit to El Salvador the first steps in procuring cooperation for this study was initiated. A meeting was arranged with Dr. Siman, the head of the HIV/AIDS division of the Ministry of Health in San Salvador to discuss the possibility of completing a study in El Salvador. Dr. Siman was happy to offer any cooperation necessary for the study. The researcher also agreed to allow the Ministry of Health to use any and all data produced by this study for use in planning future educational efforts. Additional agreements were also procured in the weeks following the initial visit to El Salvador. The researcher's medical school, the Virginia College of Osteopathic Medicine (VCOM) has an ongoing agreement with the Evangelical University in San Salvador, El Salvador (Universidad de Evangelical). The Evangelical University also has a large medical school attached to it. A meeting was arranged with the Dean of the Evangelical University and cooperation was given for this study to take place in El Salvador. Through contacts in El Salvador, access to the department of Sonsonate was procured through the National HIV/AIDS Program who's head physician in Sonsonate was eager to participate in this study.

Institutional Review Board (IRB) approval was sought through the Virginia College of Osteopathic Medicine's IRB. The application for expedited IRB approval was filed in August of 2007. IRB approval was received on August 28, 2007.

This study was conducted with the help of several nursing students from the Universidad Andres Bello. To prepare the nursing students to properly conduct this study, a three-day training session was conducted on September 5-7, 2007. This training session was comprehensive in the nature of HIV/AIDS. It included such topics as the history of HIV, the epidemiologic situation of HIV, stigma surrounding HIV, laws and regulations of HIV, counseling HIV patients, methods of security, and treatment of HIV through anti-retroviral therapy. This training session was specifically geared towards issues pertaining to HIV/AIDS in El Salvador and was conducted by local physicians who have experience in HIV/AIDS education. Multiple educational materials were used for the training seminar and they were donated entirely by the Ministry of Health in San Salvador. The last day of the training session was used entirely to thoroughly explain the questionnaire and to practice administering it. This day began by giving each student a copy of the questionnaire. Each question was reviewed individually and any clarifications were made at that time.

After a complete review of the entire questionnaire, the focus of the discussion moved on to explaining the coding system on the questionnaire and the mapping component of the study. Each questionnaire was coded with either a two or three-letter code and a four digit number code. The two-letter code coincided with the municipality or town in which the questionnaire was administered. The four digit number code ran consecutively from 0001 to 1500 with 250 questionnaires for each municipality or town. The following was the coding for the questionnaires: Acajutla: two-letter code AJ and digits 0001 to 0250, Armenia: two-letter code AR and digits 0251 to 0500, Nahuizalco: two-letter code NZ and digits 0501-0750, Nahuilingo: two-letter code NL and digits

0751-1000, San Antonio Del Monte: two-letter code SDM and digits 1001 to 1250, and San Julián: two-letter code SJ and digits 1251-1500. Questionnaires were distributed, 250 per site. Copies of physical, paper maps of each geographic location were also distributed to each site. At the beginning of each interview, each participant was "mapped on a paper map." Each interviewer asked the participant to located the relative location of where he or she lives on the paper map of the area. The interviewer then marked that point on the paper map with a dot and recorded the entire six or seven digit code from the questionnaire next to the point on the map. These points were used to create digital maps using the recorded information with the participants. After the coding system and how to record the codes on the maps was explained at length, a time was allotted for the nursing students to practice administering the questionnaire in the interview format. Final questions were taken to complete the training session.

After completion of the training session, the instructors divided the nursing students into six groups. Each group was assigned one of the municipalities. The 250 questionnaires for each group were divided among the members of each group. Each group was given maps for the municipality that they were assigned so that they could record each participant's place of residence on a map.

This study began on the same day in all of the six municipalities. The participants were recruited from each health center (Unidad de Salud) based solely on their adherence to the age requirements. No formal randomization of participants was performed but individual randomization occurred as the subjects were randomly selected while they waited for the various services offered at the health clinic. Any subject appearing to be within the age range of 15-39 was approached for possible inclusion into the study. If the

subject met the age restriction, they were asked to participate in the study. If the perspective participant agreed, the informed consent was then reviewed with each participant. Any questions concerning the informed consent was addressed at this time. The understanding and agreement of the informed consent was recorded on a separate signature page where the participant signed his or her name if he or she understood the consent and gave permission to participate in the study. If the participant was unable to sign his or her name, a fingerprint was recorded in lieu of a signature to indicate understanding and consent to be in the study. The gathering of information was initiated only after successful review and understanding of the informed consent.

After a participant was identified, found to have met the age restrictions, and agreed to and signed the informed consent, he or she was mapped on the physical, paper map for his or her municipality of residence. After the participant was successfully mapped and his or her questionnaire code was recorded on the map, the administration of the questionnaire began. All questionnaires were administered via an interview-type format. Interviews were conducted in a private setting as some of the questions were of a sensitive nature. Upon completion of the questionnaire, the participant was thanked for his or her participation and reminded that no names or identifying information will be shared by participating in this study. The goal for the completion of this study was to complete 250 questionnaires and successfully map 250 participants for each of the six municipalities.

All of the questionnaires and maps were collected after the designated collection time for fieldwork had ended. The individual answers for the questionnaires were assigned a numeric value based on how many answer choices were available for each

question. An example would be for true/false questions, a value of 1 was assigned to true answers and a value of 2 was assigned to answers of false. All data was entered into an excel spreadsheet. The two-letter code and four-digit code was listed in the first column of the spreadsheet and the question numbers were listed across the first row. A zero was entered for any question that did not receive an answer. Data entry continued until all completed questionnaires were entered into the spreadsheet.

Analysis

Analysis for this study was two-fold. All statistical analysis was done with the statistical software package Stats 9. Approaches to statistical analysis were completed with the assistance of a statistician. Descriptive statistics reported the demographic data. This data was described using the descriptive statistics of average and standard deviation. Several other tests of statistical reliability and validity were conducted as well. As per past recommendations involving the use of the Health Belief Model (HBM), Cronbach's alpha coefficient was calculated for the instrument (Champion, 1984). Cronbach's alpha coefficient was used to ensure appropriate correlation with correct responses to instrument questions as a check of construct validity. A value of alpha = 0.7 or higher was sought to accept the individual question as being significant. Further statistical analysis including regression analysis was also performed as a way to demonstrate correlations between different portions of the questionnaire. Desired correlations included correlations between demographic characteristics and exposure variables, between demographics, exposure, and perceived severity and perceived susceptibility variables, and between demographics, exposure, perceived severity, perceived susceptibility and

safe behaviors variables. Comparative analysis occurred between significant findings from both the general population sample aged 15-39 and the physician population.

Electronic mapping analysis was conducted using the Geographic Information Systems (GIS) mapping software ArcGIS 9. This program was utilized to show the gathered information in a pictorial fashion and in geographic, spatial relationship to the department of Sonsonate and to the rest of El Salvador. As stated above, each participant was mapped by placing a physical point on a paper map prior to the beginning of the interview for the study. After collection, the points on these paper maps were entered into the ArcGIS 9 software using the software package components of ArcView and ArcCatalog. A background image of the country of El Salvador was graciously provided by the University of Mississippi as a result of previous GIS work conducted by the University of Mississippi in El Salvador. With this background image, the points that were collected from the participants were cataloged and placed into the ArcGIS 9 software. After all points were entered into the software, the Excel spreadsheet containing the participants' responses was then joined to those points by using another component of the ArcGIS 9 software. After successful joining of the Excel spreadsheet to the points placed in the ArcGIS 9 software, GIS maps were produced so that individual or multiple answers to questionnaire items could be displayed in a map format. This mapping software was used extensively to create multiple maps that were used to display results from this study.

Summary

The design and completion of this study was a process that yielded results that can be added to the literature as new information. The use of the Health Belief Model enabled

this study to depict where individuals' are along the continuum from knowledge level to behavioral change. With this information, the researcher felt that better, more targeted educational campaigns could be formulated so that the most people could be reached with the appropriate HIV/AIDS educational effort. The researcher's goal was that with this information, future educational efforts could be tailored to meet specific needs rather than the mass, blanket educational efforts utilized in the past. With the addition and use of the GIS mapping software, further and more detailed information was obtained about this population. This software enabled the researcher to show, geographically, not only generally where the educational needs were but also where specific ones existed in relation to the cities in the study.

Chapter 4

Results

Introduction

The purpose of this study was to apply components of the Health Belief Model (HBM) of behavior change to the general population aged 15-39 in Sonsonate, El Salvador to determine the impact that multiple educational efforts have made on educating the population about HIV/AIDS by assessing the level of knowledge, the perceived susceptibility, the perceived severity, and the level of behavior change within this population. It analyzed how the educational efforts have served as cues to action along the continuum leading to behavioral change as outlined in the HBM and ultimately to what extent this population is engaging in behavioral change in regards to this health issue (Figure 4). Future recommendations will be made as to how best to conduct future HIV/AIDS prevention programs for this population.

Data was gathered from six municipalities or towns at the same time by the researcher with the help of a number of nursing student volunteers. During the data collection time, a total of 1,500 interviews were completed reaching the goal of 250 interviews per each of the six sites. Also, each participant was meticulously recorded on a paper map and identified with his or her personal identification number, discussed in chapter 3. The researcher coded the responses from the participants and each was given a numerical value. A zero was assigned for a non-response or an “I don’t know” answer. Other answers were coded numerically starting with number one and continuing based on the number of possible responses. An example would be with a true/false question. An answer of true received a numerical value of 1 while an answer of false received a

numerical value of 2. Theses responses were then entered into an Excel spreadsheet by the researcher with the six or seven digit identification code serving as the only identifying information. The data set was then analyzed and compiled to arrive at a rationale for answering the following research questions:

1. What was the current knowledge level of HIV/AIDS causes, prevention, and transmission among a population ranging from 15-39 and a population of physicians in six cities throughout Sonsonate, El Salvador?
2. How did the measure of perceived severity, perceived susceptibility, and participation in risky behaviors relate to each other and to knowledge level for a population aged 15 – 39 in the target area?
3. Where were the areas that have significant knowledge, perception, or behavioral deficits regarding HIV/AIDS within the target population?

Analysis

The final dataset was composed of the answers from a total of 1,454 out of the original of 1,500 individuals. The analysis used a lower number of participants because a participant's responses were omitted if the participant failed to fully complete the questionnaire.

There were around 240 individual records for each municipality or town from the general population and another 15 physicians who participated in the study. The questionnaire's questions were divided into four categories to be examined: demographics and exposure, knowledge, perceived severity and susceptibility, and behavior.

The data set was subjected to basic descriptive statistics first. The researcher refined the data contained in the Excel spreadsheet before analysis began. One revision that occurred was a recoding of the instrument questions with the assignment of a label rather than a number to identify the individual instrument questions within the various sections of the instrument (Appendix D and Appendix E). The original instrument contained the following demographic measures: ability to read, gender, age, marital status, religion, education level, and occupation. For the final analysis the occupation measure was omitted due to the extreme variability that existed among the responses. Participants were excluded from the analysis process by not fully answering the section, demographics and exposure, knowledge, perceived severity/susceptibility, or behavior, under analysis. This will be discussed further in each of the following sections.

Demographics and Exposure Statistics

The number of participants used for analysis in this section varied from 1430 to 1444 participants as the numbers who answered each question varied. The analysis of this section was composed of the following variables: ability to read, education level, marital status, religion, gender, age, owns a TV, owns a radio, watches TV, and listens to the radio. Some additional variables were created to supplement the analysis of the demographic and exposure section. A variable, nowmarried, was created that depicted a 1 if the individual was currently married, 0 if not. A variable, catholic, was created that was 1 if the individual was Catholic, 0 if not. A variable, protestant, was created that was 1 if the individual was protestant, 0 if not. Gender was also recoded so that when an individual was male the value was 1 and 0 when the individual was a woman. Three education variables were created that were 1, respectively, if the individual's education

was primary, secondary, university, 0 in other cases. Multiple new variables were created for the exposure to TV and radio sections. A variable that was 1 when the individual reported watching TV daily or weekly, 0 otherwise and a variable that is 1 when the individual reported listening to the radio daily or weekly, 0 otherwise were both added. Another TV variable was also created that was 1, respectively, if the individual reported watching TV 30 minutes to 1 hour, 1-2 hours, 3-4 hours, more than 4 hours, 0 otherwise. Radio was treated in the same manner and was composed of the same time parameters. For a full list of the demographics and exposure statistics, please refer to Appendix F. A summary of the demographics and exposure statistics is listed below in Table 1.

Descriptive Statistics of Demographics and Exposure Variables

Category	Frequency		Percentage	
Able to Read	Yes (1,285)	No (147)	89.7%	10.3%
Education Level				
Primary	541		37.7%	
Secondary	698		48.6%	
University	88		6.1%	
No School	109		7.6%	
Marital Status				
Single	558		38.8%	
Married	862		59.9%	
Divorced	12		0.8%	
Other	7		0.5%	
Religion				
Catholic	620		43.4%	
Protestant	413		28.9%	
Other*	397		27.8%	
Gender				
Male	351		24.4%	
Female	1,089		75.6%	
Own a TV	Yes (1,231)	No (212)	85.3%	14.7%
Owns a Radio	Yes (1,267)	No (175)	87.9%	12.1%
Watches TV^	Yes (1,001)	No (441)	69.4%	30.6%
Listens to the Radio^	Yes (964)	No (477)	66.9%	33.1%

Table 1: Descriptive Statistics of Demographics and Exposure Variables

*the Other category for the religion question was explained to each participant as the answer to choose if he/she did not claim any religious affiliation or any that was not either Catholic or Protestant.
^signified Yes if the participant answered that he/she watched TV or listened to the radio on a daily or weekly basis and No if they watched or listened only rarely or none at all.

The demographics and exposure data was also gathered for the second population in this study, the physicians working in the clinics where the general population was taken. The physician population consisted on a small population, n=15. However, this sample size did represent every physician that was working in each of the six health centers in each of the six municipalities or towns used for the study. Some general demographic statistics regarding the physician sample are displayed below in Table 2**.**

Descriptive Statistics for the physician population

Category	Frequency	Percentage
Reading Ability	Yes (15) No (0)	Yes 100%
Gender		
Male	9	60%
Female	6	40%
Age (Avg)		30
Marital Status		
Married	5	33.3%
Single	10	66.7%
Religion		
Catholic	11	73.3%
Protestant	3	20.0%
Other	1	6.7%
Education		
University	15	100%
Own TV?	15	100%
Own Radio?	15	100%
Watch TV?	15	100%
Listen to Radio?	15	100%

Table 2: Descriptive Statistics for the Physician Population

Research Question 1

What was the current knowledge level of HIV/AIDS causes, prevention, and transmission among a population ranging from 15-39 and a population of physicians in six cities throughout Sonsonate, El Salvador?

There were a total of 26 questions about knowledge of HIV/AIDS transmission and prevention. The alpha value for these 26 variables was 0.63 with significance occurring at $\alpha > 0.7$. All of the knowledge questions were true/false. A value of 1 was assigned if the respondent answered correctly, 0 if not.

The number of correct responses by each participant was summed and then divided by 26. This gave us an index of knowledge (k) between 0 and 1: the value of this index was equal to the percentage of questions to which the subject answered correctly. Through this process the variables become aggregated as if arising from a single dimension. This type of analysis was done to counteract the sub-optimal level of significance obtained by the α value.

A total of 170 participants were excluded from this knowledge (k) index. If a subject did not answer one (or more) of the knowledge questions, then he or she was excluded from the final analysis and thus was not computed a knowledge (k) index. This was a concern at the onset for possible implications in further analysis. However, when it was assumed that not answering a question meant no knowledge on that question by the subject, the mean and the standard deviation of the index change only slightly. The researcher took this as providing some evidence that the many missing values would not create a problem for the analysis. This will be revisited in the results section regarding regression analysis. A full report on all of the knowledge statistics refer to Appendix F. Some basic statistics about the knowledge index are displayed below in Table 3.

Descriptive Statistics for the Knowledge (k) Index

Mean			0.780552 (78.1%)		
Standard Deviation			0.121026		
Percentiles	10%	25%	50%	75%	90%
	0.615385	0.692308	0.807692	0.884615	0.923077

Table 3: Descriptive Statistics for the Knowledge (k) Index

The mean seemed fairly high (78.0 % answers correct): the average respondent gets 78.1% questions right. That calculated out to be, on average, approximately 20 out of 26 knowledge questions answered correctly. Figure 7 shows the plot of the distribution of the k index.

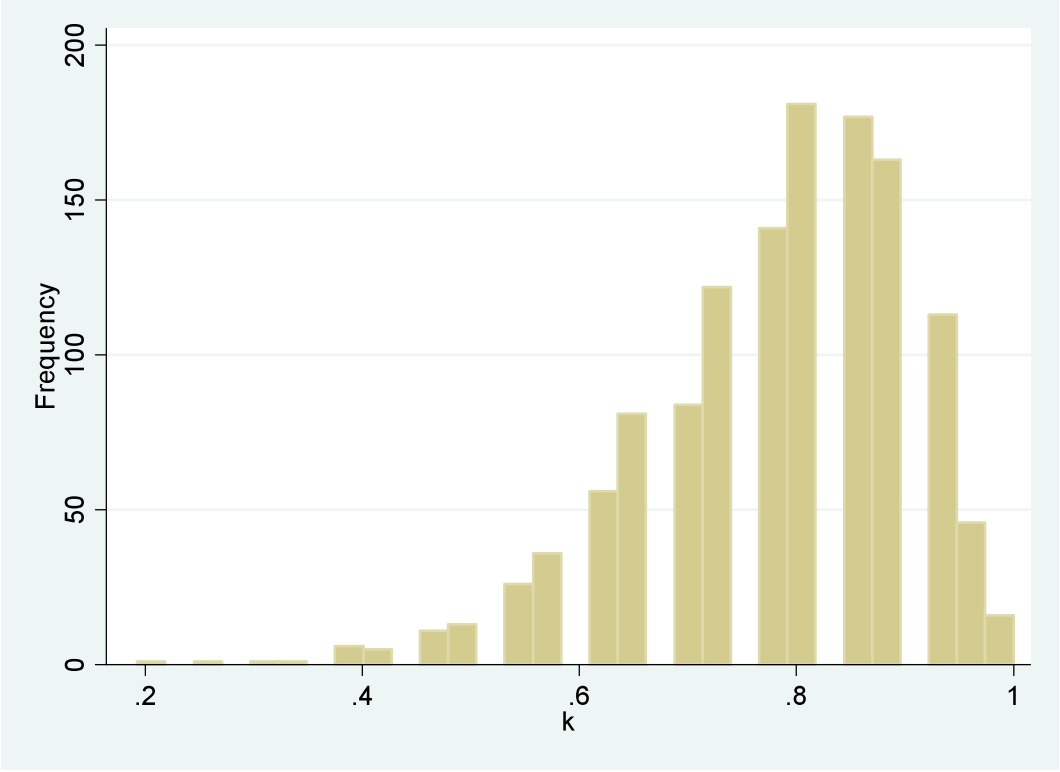

Figure 7: Knowledge (k) Index Distribution

The knowledge (k) index between men and women was similar: (k) for women was 0.7766489 (77.7%) and the (k) for men was 0.7920408 (79.2%). The knowledge (k) index by municipality or town is represented below in Table 4.

Knowledge (k) Index by Municipality or Town

Municipality or Town	Knowledge (k) Index
Acajutla (AJ)	0.7901453 (79.0%)
Armenia (AR)	0.7831144 (78.3%)
Nahulingo (NL)	0.7685051 (76.9%)
Nahuizalco (NZ)	0.7621083 (76.2%)
San Antonio Del Monte (SDM)	0.7780374 (77.8%)
San Julián (SJ)	0.8018315 (80.2%)

Table 4: Knowledge (k) Index by Municipality or Town

However, for closer observation of the analysis, please refer to Appendix F, several questions had a low, correct response rate. The questions listed in Table 5 below received less than a 75% correct response rate (approximately 385 participants answered incorrectly).

Questions With Low, Correct Response Rates and Their Percentages

True/False Question	% Answered Correctly (n value)
HIV testing is free.	73.8% (1,055)
People usually become very sick with AIDS a few days after being infected with HIV.	42.1% (600)
People have been known to get HIV and develop AIDS from insect bites.	71.5% (1,026)
It is safer not to have sexual intercourse at all than to have sexual intercourse using a condom.	72. 4% (1,028)
A vaccine has recently been developed that prevents people from getting HIV.	66.2% (941)
You can get HIV through an open cut or wound.	59.8% (854)
You can get HIV from kissing.	71.4% (1,027)
You can get AIDS from oral sex.	70.3% (1,008)
A vaccine is available to prevent AIDS.	70.7% (1,011)
Using a condom during sex can lower the risk of getting AIDS.	72.7% (1,039)
The cause of AIDS is unknown.	60.6% (871)

Table 5: Questions with Low, Correct Response Rate and Their Percentages

Within the physician sample, n=15, the knowledge rate approached perfection. The average correct response rate among the 15 physicians, for the knowledge portion, was 98.9% correct. However, one question, "You can get HIV through an open cut or wound," produced a correct response rate among the physicians of only 53.3% (8 physicians answering correctly). As stated above, the correct response to this question compares with that of the general population sample, which had a 59.8% correct response rate to the same question. The physicians who participated in this study also had an additional section consisting of 8 questions that were not included in the general population questionnaire. These questions dealt with if and how the physicians counseled

their patients about HIV/AIDS. The following table shows each of the additional questions and how the physicians responded. Refer to Table 6.

Response to Physician Section of Questions

Question	**Percentages (n values)**	
I counsel my patients on HIV/AIDS.	Yes 86.7% (13)	No 13.3% (2)
I offer my patients HIV testing.	Yes 80% (12)	No 20% (3)
I have HIV/AIDS patients.	Yes 66.7% (10)	No 33.3% (5)
I have HIV/AIDS education materials available in my clinic.	Yes 86.7% (13)	No 13.3% (2)
HIV is a major health problem in this community.	Strongly Agree 66.7% (10)	Agree 33.3% (5)
The number of HIV positive people will increase in this community over the next 5 years.	Strongly Agree 73.3% (11) Agree 13.3% (2)	Neither Agree Nor Disagree 6.7% (1) Strongly Disagree 6.7% (1)
Prostitution is a problem in this community.	Strongly Agree 40% (6) Agree 13.3% (2)	Neither Agree Nor Disagree 26.7% (4) Disagree 13.3% (2)
My patients know how HIV is transmitted and prevented.	Strongly Agree 20% (3) Agree 40% (6)	Neither Agree Nor Disagree 13.3% (2) Disagree 26.7% (4)

Table 6: Response to Physician Section of Questions

The data from the general population and the physician population on knowledge level gave the researcher adequate input to answer the first research question: What was the current knowledge level of HIV/AIDS causes, prevention, and transmission among a population ranging from 15-39 and a population of physicians in six cities throughout Sonsonate, El Salvador?

Research Question 2

How did the measure of perceived severity, perceived susceptibility, and participation in risky behaviors relate to each other and to knowledge level for a population aged 15 – 39 in the target area?

To address this second research question appropriately, the researcher first explored the individual answers to both the perceived severity/perceived susceptibility section as well as the behavior section. This information was included below in the descriptive statistics section. This process involved evaluating individual responses as well as the population's responses as a whole to determine an overall description of the population's responses, much like what was done with the knowledge section. An additional section, regression analysis, was necessary to effectively answer this research question. This process involved drawing correlations between the various sections of the study instrument.

Descriptive Statistics

The perceived severity/perceived susceptibility section consisted of a total of 17 questions. Before analysis, some additional variables had to be created to aid in the analysis process. One variable, (riskd), was created that represented 1 when the individual thought that there was a medium or high risk that he/she will get HIV/AIDS, 0 if he/she thought there was only a small risk. Another variable, (risk2d), was created that was 1 when the individual though that, in comparison to other people of her/his age and sex, there was a medium or high risk that he/she would get HIV/AIDS, 0 if he/she thought there was only a small risk. A final additional variable, (problemd), was created that was 1 when the individual thought that, in his/her community, HIV/AIDS was a

serious problem or somewhat of a problem, 0 if only a small problem. These extra variables allowed the researcher to place all the variables for this section into the same format consisting of categories labeled by 0-1.

For this entire section, the correlation among the variables in it was too low to aggregate them into an index. Instead, the researcher used each one as an independent variable. Individual analyses were conducted on each of the 17 questions within this section. Since no index was created for the perceived severity/perceived susceptibility section only simple descriptive statistics were generated. The number of participants used for analysis of this section varied from 1,424 to 1,443 depending on response rate. As mentioned earlier, if a participant did not answer the question he/she was not included in the analysis. Since all the variables were manipulated into a single scale which consisted of 0-1, a general mean statistic was generated which described the population by the higher the mean, the higher number of individuals that answered in a way that displayed a heightened perceived severity or perceived susceptibility for each question. The following table depicts the questions from this section and also the mean for each question. Refer to Table 7.

Perceived Severity/Perceived Susceptibility Questions and Means

Question	Mean
In my community, HIV is a serious problem.	0.557 (55.7%)^
People in my neighborhood are likely to be infected with HIV/AIDS.	0.514 (51.4%)^
HIV/AIDS is a health threat I take very seriously.	0.955 (95.5%)^
There is a good chance I will HIV/AIDS within the next 5 years.	0.613 (61.3%)^
HIV/AIDS is the scariest disease I know.	0.914 (91.4%)^
I know someone infected with HIV/AIDS.	0.238 (23.8%)^
The number of people with HIV/AIDS is increasing	0.927 (92.7%)^
I am afraid of getting HIV/AIDS.	0.866 (86.6%)#
I am less likely than most people to get HIV/AIDS.	0.334 (33.4%)#
I know how to protect myself form HIV/AIDS.	0.195 (19.5%)#
Someone I know is likely to get HIV/AIDS.	0.435 (43.5%)#
What risk do you think there is of you getting HIV/AIDS?	0.401 (40.1%)#*
In comparison to other people of your age and sex, what risk of you think there is of you getting HIV/AIDS?	0.431 (43.1%)#*
I have or have had in the past, sex with prostitutes.	0.070 (7.0%)#
I have sex with various people.	0.057 (5.7%)#
I have a high chance of getting HIV/AIDS because of my past history.	0.080 (8.0%)#
I know how to have safe sex.	0.303 (30.3%)#

Table 7: Perceived severity/perceived susceptibility questions and means. (A higher mean score indicates the percentage of participants that indicated a higher perceived severity or perceived susceptibility)
^ represents questions that were in the perceived severity section
# represents questions that were in the perceived susceptibility section
* represents the questions in which additional variables were created to create all variables that had a 0-1 score

This section was used predominantly in the further analysis to show relationships between the answers to the questions in this section and their effect in turn on the knowledge and behavioral variables.

There were 14 questions about safe behavior related to HIV/AIDS contained within the behavior section. The alpha value for these 14 variables was $\alpha = 0.56$ with significance value of $\alpha > 0.7$. Some behavior questions were yes/no while others had

more than two categories. To compile these variables into a single numerical scale of 0-1, 1 was assigned if the respondent engaged in safe behavior, 0 if not.

The process used to assign these designations is described for the individual question below. Remember that not all questions in the behavior section had to be put through this process, only the ones that were in a Likert-style format and not simply a yes/no response. Refer to Table 8.

How many sexual partners have you had in the last 3 months? *0* no response *1* 0-1 *2* 1-3 *3* 3-5 *4* more than 5

Tabulation of question: How many sexual partners have you had in the last 3 months?

Value	Records	Frequency*	Cumulative %
0 No response	23	2	1.58
1 0-1	1,327	91	92.85
2 1-3	80	6	98.35
3 3-5	11	1	99.11
4 more than 5	13	1	100.00
Total Records	1,454		

Table 8: Tabulation of question: How many sexual partners have you had in the last 3 months?
*numbers rounded to the nearest whole number

How many sexual partners have you had in the last year? *0* no response *1* 0-1 *2* 1-3 *3* 3-5 *4* more than 5. Refer to Table 9.

Tabulation of question: How many sexual partners have you had in the last year?

Value	Records	Frequency*	Cumulative %
0 no response	27	2	1.86
1 0-1	1,277	88	89.68
2 1-3	107	7	97.04
3 3-5	18	1	98.28
4 more than 5	25	2	100.00
Total	1,454		

Table 9: Tabulation of question: How many sexual partners have you had in the last year?
* numbers rounded to nearest whole number

These tabulations revealed that there were just a few individuals who reported having more than one partner. Since this was the case, these two records were collapsed into one single category. The researcher defined the two variables that take the value 1 as being when one individual had one partner (in the given time frame, past 3 months or past year respectively), i.e. safe behavior and assigned a 0 otherwise. Refer to Table 10.

The next question that needed to be manipulated was: How often do you drink alcohol?

0 no response *1* Daily *2* 1-2 times a week *3* 2-3 times a month *4* rarely *5* I don't drink alcohol

Tabulation of question: How often do you drink alcohol?

Value	Records	Frequency	Cumulative %
0 no response	8	0.55	0.55
1 daily	21	1.44	1.99
2 1-2 times per week	17	1.17	3.16
3 2-3 times per week	22	1.51	4.68
4 rarely	142	9.77	14.44
5 I don't drink alcohol	1,244	85.56	100.00
Total	1,454		

Table 10: Tabulation of question: How often do you drink alcohol? (italicized number in question corresponds to the first column in the table).

Since there were just a few individuals that reported drinking alcohol, these records were collapsed into one single category. A variable was given the value of 1 when an individual reported that he/she does not drink alcohol, i.e. safe behavior, while assigned a 0 otherwise. Notice that the mean of this new variable displays the percentage of those who answered that they do not drink alcohol out of the total of respondents to this question. Hence, the new variables all report the percentage of respondents that report they participated in the safe behavior related to the question.

These were all the Likert-style questions within the behavior section that could be manipulated into a 0-1 scale so that an index of safe behavior (b) could be formed. However, one more question remained in the behaviors section that needed to be manipulated into a similar way so that the behavior (b) index would be complete. Refer to Table 11. The question was: How old were you the first time you had sex?

0 no response *1* 12 or younger *2* 13-17

3 18-22 *4* 23-27 *5* Have not had sex

Tabulation of question: How old were you the first time you had sex?

Value	Records	Frequency	Cumulative %
0 no response	14	0.96	0.96
1 12 or younger	75	5.16	6.12
2 13-17	666	45.80	51.93
3 18-22	384	26.41	78.34
4 23-27	78	5.36	83.70
5 have not had sex	237	16.30	100.00
Total	1,454		

Table 11: Tabulation of question: How old were you the first time you had sex? (italicized number in question corresponds to the first column in the table).

This variable contained more than three categories with many records in it. For simplicity's sake, the researcher partitioned it into two categories by creating the a new variable, (aged), that was assigned the value of 0 when the first time the individual reported having sex he/she was younger than 18 and assigned the value of 1 when he/she was at least 18 years old when he/she first had sex or reported not having had sex. Hence, the reported number in the behavior (b) index represented the percentages of participants that reported engaging in safe behaviors. As said, before there were more than three categories with many records in it and so by partitioning all the information in only two categories some information from the data was lost. However, since the goal of the researcher was to display the numbers of participants who reported safe behavioral practices, this partitioning into a 0-1 variable category was justified. A full report of all of

the variables used within the behavior section can be found in Appendix F. The following table shows each question within the behavior section and the frequency and percent of the responding population that answered in a way that depicted a safe behavior.

Tabulation of Safe Behavior Questions

Question	Behavior Partition	Frequency	Percentage
How many sexual partners have you had in last 3 months?	Safe Not Safe	1,318 104	92.7% 7.3%
How many sexual partners have you had in last year?	Safe Not Safe	1,268 149	89.5% 10.5%
How old were you the first time you had sex?	Safe Not Safe	770 660	53.8% 46.2%
How often do you drink alcohol?	Safe Not Safe	1,236 200	86.1% 13.9%
I use a condom, have sex with only one partner, or abstain from sexual activity because of the threat of HIV/AIDS.	Safe Not Safe	697 703	49.8% 50.2%
In the last six months, I have had sex with a prostitute.	Safe Not Safe	1,311 26	98.1% 1.9%
In the last six months, I have had oral sex.	Safe Not Safe	1,252 112	91.8% 8.2%
In the last six months, I have had vaginal intercourse without a condom.	Safe Not Safe	662 747	47.0% 53.0%
In the last six months, I have had anal sex.	Safe Not Safe	1,307 59	95.7% 4.3%
There is still time to protect myself from HIV/AIDS.	Safe Not Safe	1,401 32	97.8% 2.2%
I am very careful about who I have sex with.	Safe Not Safe	1,337 77	94.6% 5.5%
I have had an HIV test.	Safe Not Safe	637 802	44.3% 55.7%
I only have sex with one person, my husband/wife.	Safe Not Safe	1,132 230	83.1% 16.9%
I have injected drugs in the past	Safe Not Safe	1,359 68	95.2% 4.8%

Table 12: Tabulation of safe behavior questions.

The number of correct responses indicating engagement in a safe behavioral practice was summed and the number was divided by 14, the total number of questions in this section, which created an index of safe behavior (b) with value between 0-1. The

value of this index was interpreted as the percentage of circumstances in which the subject behaved safely. This index was constructed so that by showing the mean of all of the 0-1 variables, an aggregation was made so that the variables can be displayed as arising from a single dimension.

The researcher made the decision to aggregate the variables in this manner even though the alpha value was not perfect. The value of this index for a certain individual could be interpreted as the percentage of times that individual behaved safely. A graphical representation of the behavioral (b) index is shown below. Refer to Figure 8.

Frequency Diagram for Behavior (b) Index

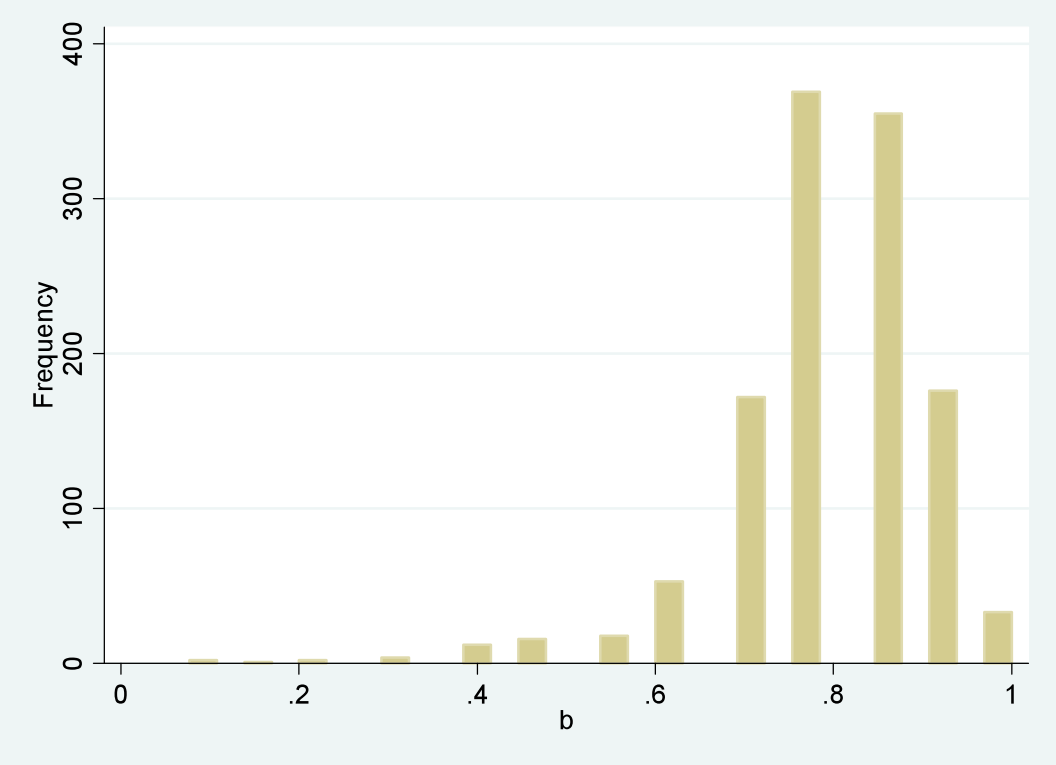

Figure 8: Frequency diagram for behavior (b) index. (As numbers approach 1, the numbers of participants who reported safe behaviors increased)

The mean was 0.79 or on average the participants in this study reported a safe behavior 79% of the time and the standard deviation was 0.12. This index of safe behavior (b) was

missing for 239 subjects. If a subject did not answer one or more questions from the behavior questions, then he/she had a missing index. This might have created a problem for our analysis. However, when it was assumed that not answering a question meant the participant engaged in an unsafe behavior, the mean and the standard deviation of the index changed only slightly. This was taken as providing some evidence that the many missing values would not create a problem for our analysis. Just one note in this regard, one reason the alpha value was not good for this category was that the questions in it may not fully have captured the safe behavior attitude of individuals. For example, 746 subjects say that they had sex without condom. But, as it can be seen from the table below, 80% (i.e. 590/746) of those who had sex without condom were currently married. By the way the question is worded we do not know whether those who had sex without a condom had sex without a condom with their partner. Refer to Table 13.

Combined Chart of Behavior Question and Marital Status.

Question	Single	Married	Total
In the last 6 months: I have had vaginal intercourse without a condom			
Safe	395	263	658*
Not Safe	156	590	746*
Total	551*	853*	

Table 13: Combined chart of behavior questions and marital status
* represents values that are less than previously reported for respective variables. These values are lower because participants that did not answer one or the other question were excluded from this comparison.

One step further, explored not just married participants in regard to this question but also participants who reported having only a single partner in the last year. By utilizing the same determinations as in the above table, the variables of the amount of participants having had sex in the last 6 months without a condom and the variable of number of sexual partners reported in the last year were combined. This showed that out

of the 746 participants who reported having had sex without condom in the last 6 months, 649 had only one partner last year. Assuming subjects were sincere, that information led the researcher to think that many of those who had sex without condom (ie an unsafe behavior) had sex without a condom only with their monogamous partner, which made this unsafe behavior less unsafe.

This same logic was used to analyze the other sexual practices questions regarding engagement in anal sex and oral sex. The same comparison was used, relating participation in these unsafe behavioral practices with whether the individual was married or in a relationship with only a single partner. A synopsis of these findings are presented in the following table.

Combined Totals Comparing Behavior With Monogamy

Question (# participating in unsafe behavior/total)	Frequency of Married Participants (#/total)	Percentage	Frequency of One Partner Within the Last Year	Percentage
In the last six months: I have had vaginal intercourse without a condom	590/746	80%	649/741	88%
In the last six months: I have had anal sex	35/59	60%	28/59	47%
In the last six months: I have had oral sex	66/111	59%	59/112	53%

Table 14: Combined totals comparing behavior with monogamy.

A full set of data concerning all the behavioral variables can be found in Appendix F.

Further analysis of the data focused on comparing the relationships between the sections of variables that have been described statistically above. The goal of the researcher was to show relationships between the sections of the instrument so that a

clearer understanding of the population, in this study, could be delineated. To make these further analyses, regression was used.

Regression Analysis

This set of analyses focused on making comparisons between the sections of data following this model:

1) Demographics and exposure to media affected knowledge about HIV/AIDS.

2) Demographics, exposure, and knowledge in turn affected how susceptible a person deemed to be to HIV/AIDS and how severe a problem he/she thought HIV/AIDS was.

3) Demographics, exposure, knowledge, susceptibility and severity all affected the safe or unsafe behavior of an individual.

Each of these comparisons was explored using regression analysis.

Focused on number 1 from the model, knowledge was used as the dependent variable and Ordinary Least Squares (OLS) was used to regress the knowledge (k) index onto the demographics and exposure variables. As a reminder, the knowledge (k) index varied in value for each participant from 0-1. This value corresponded to the percentage of questions to which the respondent answered correctly within the knowledge section. The results are presented in the following table. Refer to Table 15.

Regression of Knowledge (k) Index With Demographics/Exposure Variables

Number of obs=1230
F(22, 1207)=16.13
Prob > F=0
R-squared=0.2272
Adj R-squared=0.2131

k	Coef.	Std. Err.	t	P>t	[95% Confidence Intervals]	
gender	-0.00341	0.00742	-0.46	0.646	-0.0179693	0.0111465
age	-0.00222	0.003711	-0.6	0.55	-0.0094989	0.0050612
agesqr	4.64E-05	6.86E-05	0.68	0.5	-0.0000883	0.000181
read	0.102588	0.014774	6.94	0	0.0736029	0.1315736
nowmarried	0.000734	0.00738	0.1	0.921	-0.0137455	0.0152129
catholic	0.008817	0.007555	1.17	0.243	-0.0060042	0.023639
protestant	0.009944	0.00827	1.2	0.229	-0.0062823	0.0261694
primschool	-0.03117	0.01693	-1.84	0.066	-0.0643868	0.0020435
secschool	0.026691	0.017986	1.48	0.138	-0.0085961	0.0619774
univschool	0.069819	0.021367	3.27	0.001	0.0278982	0.1117391
tv	0.018213	0.011164	1.63	0.103	-0.0036901	0.040116
radio	0.003956	0.011287	0.35	0.726	-0.0181877	0.0260993
watchtvd*	0.008376	0.008391	1	0.318	-0.0080868	0.0248393
lstnrad_d*	0	0.008137	-0.15	0.878	-0.0172157	0.0147121
watchtv1h*	0.024863	0.009626	2.58	0.01	0.0059788	0.043748
watchtv2h*	0.03426	0.010274	3.33	0.001	0.0141034	0.0544163
watchtv3h*	0.011962	0.013307	0.9	0.369	-0.0141463	0.0380703
watchtv4h*	0.05466	0.015742	3.47	0.001	0.0237743	0.0855446
lstnrad1h*	0.002389	0.009306	0.26	0.797	-0.015869	0.0206478
lstnrad2h*	0.004202	0.009884	0.43	0.671	-0.0151892	0.0235923
lstnrad3h*	0.011286	0.012509	0.9	0.367	-0.0132562	0.0358282
lstnrad4h*	0.010203	0.011178	0.91	0.362	-0.0117285	0.0321335
_constant	0.6516545	0.048805	13.35	0	0.555903	0.7474059

Table 15: Regression of knowledge (k) index with demographics/exposure variables. Highlighted lines indicate significant independent variables. A variable is significant at the 5% level and has a positive (negative) effect on the dependent variable if t>1.96 (t<1.96). The t statistic is reported in the fourth column of the above table.
* represents variations that were produced for the exposure to TV and radio variables. watchtvd and lstnrad_d represents the participants who watched any TV or listened to any radio as opposed to not watching or not listening at all. none. watchtv1h and lstnrad1h represents watching or listening 30 min to 1 hour. watchtv2h and lstnrad2h represents watching or listening 1-2 hours. watchtv3h and lstnrad3h represents watching or listening for 3-4 hours. watchtv4h and lstnrad4h represents watching or listening for more than 4 hours.
The last line represents the constant and is usually not reported. It states that, even if all the value of the other independent variables was 0, the predicted average knowledge would be the coefficient of this constant (i.e. 0.65).

The highlighted variables represent the significant independent variables, i.e. the variables to which the researcher could attribute some power of explaining our index of knowledge. When the sign on the coefficient of a independent variable, such as read, was calculated as positive then this told the researcher that as the value of such independent variables increase, the index of knowledge (k) would also increase. This is also true for coefficients that produced a negative value. If the calculated value reached significance and was negative, then as that value increased or approached one, the knowledge (k) index would decrease. Remember that all of the variables have been recoded so that a higher value would represent a higher knowledge of HIV/AIDS, ie a higher knowledge (k) index.

Five variables produced significant findings, $t>1.96$ for positive correlations and $t<1.96$ for negative correlations. This value is represented in the fourth column of the above table. The significant variables were analyzed further by exploring each coefficient's magnitude. If a person was able to read, then the index of knowledge (k) went up by 0.1: so, if a person was able to read, he/she got, on average, 2.6 additional questions right, out of the 26 questions on the questionnaire, more than someone who was illiterate. Stated another way, if a person was able to read and was taking a 100 question survey about HIV/AIDS knowledge, he/she would get on average 10 more questions right than someone who was illiterate. Looking at Appendix F, if someone had gone to the university then his/her index of knowledge (k) went up by 0.07. So, if a person had attended a university, he/she got, on average, 1.8 (i.e. 0.07*26) additional questions right, out of the 26 questions on the questionnaire, more than someone who had never gone to school. Exposure to TV somewhat increased the knowledge (k) index with respect to

those who watched TV more than 4 hours per day. However, this effect was small and was no more than 0.05 points, which translated to an increase of 1.3 questions correct out of the 26 on the questionnaire compared to someone who watched no TV. Exposure to radio had no effect.

Several robustness checks were done for this regression. In the knowledge section above, the knowledge index had 170 missing values. If it is assumed that no answer is equal to no knowledge and the same regression was run then qualitatively, identical results were obtained compared to the ones in the table above. Interestingly, if it was assumed that no answer was equal to knowledge and the same regression was run, qualitatively identical results were again obtained compared to the ones in the table above except that now going to the primary school had a negative effect with respect to not going. Therefore, those who did not answer were those with no schooling and so presumably they did not answer because they did not have the knowledge. If artificially we make knowledgeable by assuming that no answer is equal to knowledge, then those who have just a bit more knowledge (primary schooling) appear as less knowledgeable than before.

The same regressions were run eliminating the outliers for k (Outliers were identified as having k less than .35): the rationale for running this focused on that the researcher did not want the results to depend on just few observations that had extreme values. In this corrected regression, the sign of the significant coefficient remained the same. The only difference was that now having attended a secondary school had a positive and significant coefficient.

Owning a TV (variable TV), watching TV (watchtv and the created watchtvd), and watching TV for a certain amount of time were correlated. The same was true for the radio variables. So, the regression was rerun including only TV and radio or TV, radio, watchtvd, and lstnrad_d or only watchtvd and lstnrad_d. The results were very similar to the previous regression listed above. No significant differences emerged. No religion variable was significant. Also, interestingly, no radio variable is ever significant while some or more than one TV variable remained significant. The effect of secondary school became significant only sometimes.

The second comparison, from the model above, demographics, exposure, and knowledge in turn affected how susceptible a person deemed to be to HIV/AIDS and how severe a problem he/she thought HIV/AIDS was. This comparison involved running regressions with the perceived severity and perceived susceptibility variables as the dependent variables and that made demographics/exposure and knowledge variables independent. The first step was to regress each of the perceived severity and perceived susceptibility variables onto the demographics and media exposure variables and onto the knowledge (k) index. The dependent variables all had 0-1 value, as did the previous model, however the dependent variables were not aggregated into an index therefore a Probit estimation was used for this regression and not OLS. This process produced numerous correlations as each perceived severity and perceived susceptibility variables was regressed individually with the demographics/exposure and knowledge (k) index. Due to the complexity, only significant correlations were reported ($t>1.96$ for positive $t<1.96$ for negative). The results are reported below for the significant independent variables for each of the dependent variables. The results are reported in the following

format: dependent variable: independent variable (sign of the coefficient). To understand the sign of the coefficient, remember that the variables were recoded so that a higher value meant a higher perceived severity or a higher perceived susceptibility. Numerous correlations proved to be significant when the perceived severity and perceived susceptibility variables were used as dependent variables. The following table showed each variable within this section, what correlations were significant, and whether those correlations were positive or negative. Refer to Table 16.

Significant Correlations for Perceived Severity and Perceived Susceptibility Variables

Question	Significant Correlations	Coefficient Sign*
HIV/AIDS is a problem in my community.^	k index Marital status Owns TV	Negative (-) Negative (-) Positive (+)
People in my neighborhood are likely to be infected with HIV/AIDS.^[1]	Reading ability Obtained Primary, Secondary, or University Education	Negative (-) Positive (+)
HIV/AIDS is a health risk I take seriously.^	No correlations	
HIV/AIDS is the scariest disease I know.^[2]	Reading ability Marital status	Negative (-) Negative (-)
I know someone infected with HIV/AIDS.^	k index gender Obtained university education	Positive (+) Negative (-) Negative (-)
The number of people with HIV/AIDS is increasing.^[3]	No correlations	
I am afraid of getting HIV/AIDS.#	k index Catholic Marital status	Positive (+) Positive (+) Negative (-)
I am less likely than most people to get HIV/AIDS.#	Age Catholic Listen to radio 3-4 hours at a time	Negative (-) Positive (+) Positive (+)
I know how to protect myself from HIV/AIDS.#	No significant	
Someone I know is likely to get HIV/AIDS. #	k index Gender	Positive (+) Negative (-)
The risk of me getting HIV/AIDS is high.#	k index Gender Obtained university education	Positive (+) Positive (+) Positive (+)
In comparison to other people my age and sex, I have a higher risk of getting HIV/AIDS.#	TV Marital status Protestant	Positive (+) Negative (-) Negative (-)
In the past, I have sex with a prostitute.#[4]	Reading ability Marital status Protestant	Positive (+) Negative (-) Negative (-)
I have a high chance of getting HIV/AIDS.# because of my past history.#	k index Listen to radio more than 4 hours at a time Gender Age	Negative (-) Negative (-) Positive (+) Positive (+)

Table 16: Significant correlations for perceived severity and perceived susceptibility variables
^ represents variables from the perceived severity section
# represents variables from the perceived susceptibility section
*Interpretation of the coefficient sign: When the sign on the coefficient of a independent variable, k index, was calculated as positive then this told the researcher that as the value of such independent variables increase, then the dependent variable (perceived severity or perceived susceptibility variable) would also increase. If the calculated value reached significance and was negative, then as that value increased or approached one, the effect on the dependent variable would decrease respectively.
1.Remember that for these school variables, the omitted category is no schooling. So a positive coefficient on univschool, say, should be understood as follows: an individual with a university degree has a higher chance of having a high value for the neighbor variable than an individual with no schooling but his chance is not necessarily higher than the one of an individual with only a high school degree.
2. Note that we have recoded gender so that when an individual is male the value is 1 and 0 when the individual is a woman.
3. The reference category here is 'other' in the religion variable. So, this says that if someone is catholic he has a higher chance of having a high value for the prev variable than an individual who responded 'other' but his chance is not necessarily higher than the one of a protestant individual.
4. From the tabulation of this variable it was discovered that 100 persons out of 1453 had sex with a prostitute and 30 were women.

The final comparison model ran with this data was: Demographics, exposure, knowledge, perceived severity and perceived susceptibility all affected the safe behavior of an individual. For this comparison, safe behavior was regressed, as the dependent variable, on all the other variables: the knowledge index, demographics, exposure and all the severity and susceptibility variables. OLS was used for this regression given that the dependent variable was a cardinal measure: it measured the percentage of cases in which a subject reportedly behaved safely. The results are listed in the following table with b representing the behavioral (b) index. Refer to Table 17.

Regression of the behavior (b) index with demographics and exposure, knowledge (k) index, and perceived severity and perceived susceptibility variables.

b	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
k	0.152405	0.031398	4.85	0	0.090789	0.214021
gender	-0.0449	0.00819	-5.48	0	-0.06098	-0.02883
age	0.000843	0.000515	1.64	0.102	-0.00017	0.001853
read	0.044052	0.015165	2.9	0.004	0.014292	0.073812
nowmarried	0.012678	0.007415	1.71	0.088	-0.00187	0.027229
catholic	0.024249	0.007814	3.1	0.002	0.008916	0.039583
protestant	0.01788	0.0086	2.08	0.038	0.001002	0.034757
primschool	-0.00024	0.016769	-0.01	0.988	-0.03315	0.032665
secschool	0.010025	0.017863	0.56	0.575	-0.02503	0.04508
univschool	0.002936	0.021604	0.14	0.892	-0.03946	0.045333
tv	-0.02039	0.011722	-1.74	0.082	-0.04339	0.002616
radio	0.008385	0.011519	0.73	0.467	-0.01422	0.03099
watchtvd	-0.01973	0.008706	-2.27	0.024	-0.03681	-0.00264
lstnrad_d	0.002627	0.008362	0.31	0.753	-0.01378	0.019037
watchtv1h	0.023609	0.010084	2.34	0.019	0.00382	0.043399
watchtv2h	0.016912	0.010846	1.56	0.119	-0.00437	0.038197
watchtv3h	0.002102	0.013539	0.16	0.877	-0.02447	0.028671
watchtv4h	0.010917	0.01696	0.64	0.52	-0.02237	0.044199
lstnrad1h	0.003994	0.00959	0.42	0.677	-0.01482	0.022814
lstnrad2h	-0.00776	0.010224	-0.76	0.448	-0.02782	0.012306
lstnrad3h	-0.00796	0.012843	-0.62	0.535	-0.03317	0.017242
lstnrad4h	-0.01103	0.011436	-0.96	0.335	-0.03347	0.01141
afraid	0.024442	0.010142	2.41	0.016	0.004539	0.044346
chance2	-0.00663	0.006888	-0.96	0.336	-0.02015	0.006888
protect	-0.02496	0.008544	-2.92	0.004	-0.04173	-0.00819
chance3	-0.00262	0.007061	-0.37	0.711	-0.01648	0.011236
riskd	0.01211	0.007566	1.6	0.11	-0.00274	0.026959
risk2d	0.000685	0.007402	0.09	0.926	-0.01384	0.015211
prost	-0.08339	0.013023	-6.4	0	-0.10895	-0.05783
partner3	-0.11804	0.014364	-8.22	0	-0.14623	-0.08985
chance4	-0.04586	0.012496	-3.67	0	-0.07038	-0.02134
safe	-0.01219	0.007561	-1.61	0.107	-0.02702	0.002651
problemd	0.003245	0.006804	0.48	0.634	-0.01011	0.016598
neighbor	-0.00081	0.007192	-0.11	0.91	-0.01493	0.013302
threat	0.009337	0.015778	0.59	0.554	-0.02163	0.0403
chance	-0.00341	0.006816	-0.5	0.617	-0.01679	0.009962
scary	0.011404	0.011488	0.99	0.321	-0.01114	0.033947
know	-0.02039	0.007989	-2.55	0.011	-0.03607	-0.00471
prev	0.009634	0.012615	0.76	0.445	-0.01512	0.034389
_cons	0.582437	0.032953	17.67	0	0.517768	0.647105

Table 17: Regression analysis of behavior (b) index with the demographics/exposure, knowledge (k) index, and the perceived severity and susceptibility variables. Highlighted lines indicate significant independent variables. A variable is significant at the 5% level and has a positive (negative) effect on the dependent variable if t>1.96 (t<1.96). The t statistic is reported in the fourth column of the above table.

*represents variations that were produced for the exposure to TV and radio variables. watchtvd and lstnrad_d represents the participants who watched any TV or listened to any radio as opposed to not watching or not listening at all. none. watchtv1h and lstnrad1h represents watching or listening 30 min to 1 hour. watchtv2h and lstnrad2h represents watching or listening 1-2 hours. watchtv3h and lstnrad3h represents watching or listening for 3-4 hours. watchtv4h and lstnrad4h represents watching or listening for more than 4 hours.
^represents the code for the questions in the perceived severity and perceived susceptibility section. Refer to the instrument in Appendix D for a reference.
The last line represents the constant and is usually not reported. It states that, even if all the value of the other independent variables was 0, the predicted average safe behavior would be the coefficient of this constant (i.e. 0.58).

This regression produced 12 significant correlations ($t>1.96$ for positive and $t<1.96$ for negative respectively), 6 positive and 6 negative ones. To simplify the interpretation of this regression, the results are explained below in words.

- If the knowledge (k) index was higher, the safe behavior (b) index also increased. As to magnitudes, if the knowledge (k) index was higher by 0.1 (i.e. a subject, out of 100 questions about HIV/AIDS, got 10 more right), then the safe behavior (b) index increased by 0.015 (i.e a subject, out of 100 HIV/AIDS related behaviors, reportedly behaved safely in 1.5 circumstances more).
- Being male made someone behave unsafely in 4 cases more out of 100 compared to being female.
- Being able to read made someone behave safely in 4 cases more out of 100 compared to someone who was illiterate.
- Being Catholic made someone behave safely in 2 cases more out of 100, than someone who responded “other” to the religion question.
- Being protestant made someone behave safely in 1 case more out of 100, than someone who responded “other” to the religion question.
- Watching TV on a daily or weekly basis made someone behave unsafely in 1 case more out of 100 compared to someone who reported watching TV only rarely or not at all.

- Watching TV 30 minutes – 1 hour a day made someone behave safely in 2 cases more out of 100, than someone who watched it only 30 minutes or less.
- If someone was afraid of getting HIV/AIDS, he/she would behave safely in 2 cases more out of 100, compared to someone who reported not being afraid of getting HIV/AIDS.
- If someone reported that he/she knew how to protect him/herself from HIV/AIDS, then he/she behaved unsafely in 2 cases more out of 100 compared to someone who reported that he/she did not know how to protect him/herself. Someone that knew how to protect him/herself from HIV/AIDS may have engaged more in behaviors that were unsafe (anal and oral sex e.g.) if they were done carelessly (e.g. with an occasional partner).
- If someone had sex with various people, then he/she behaved unsafely in 11 cases more out of 100 compared to someone who reported not having sex with various people.
- If someone felt he/she had a high chance of getting HIV/AIDS because of his/her past history, then he/she behaved unsafely in 4 cases more out of 100 compared to someone who reported not having a high chance of getting HIV/AIDS because of his/her past history.
- If someone knew someone infected with HIV/AIDS, then he/she behaved unsafely in 2 cases more out of 100 compared to someone who reported not knowing anyone with HIV/AIDS.

The findings produced through these regressions successfully addressed all the components to adequately answer the second research question: How did the measure of

perceived severity, perceived susceptibility, and participation in risky behaviors relate to each other and to knowledge level for a population aged 15 – 39 in the target area? By being able to successfully show so many correlations through the multiple regressions, the researcher was satisfied that all components of this question were addressed.

Research Question 3

Where were the areas that have significant knowledge, perception, or behavioral deficits regarding HIV/AIDS within the target population?

To address the third research question, the researcher utilized Geographical Information Systems (GIS) software and produced pictorial representations of the results of this study. The researcher sought to produce data that could be used in multiple avenues so that further educational programs could be implemented in areas of need. For this reason, GIS mapping seemed like a great fit to be able to practically and graphically display the results from this study. Using GIS for the purpose of mapping health related subjects is defined as a process which enables the use of health and human service qualitative and quantitative data, through a Geographic Information System (GIS) in order to more effectively visualize its relation to other data relative to where it is on the earth's surface. For this study, single dimension maps were created that displayed a single variable from the instrument as well as multi-dimensional maps that displayed multiple variables overlaid on the same map to accent correlations and clustering of similar results from multiple variables. The researcher compiled the following list of attributes in which the use of GIS mapping could contribute to this study:

- Visualization of survey results and ability to perform statistical analysis
- Overlay with other relevant information

- Ability to draw correlation between survey results
- Show trends over time
- Ability to target areas of needs
- Informing the public
- Show how the HIV/AIDS program has been successful
- Identify existing resources relative to population and types of communication

For this study, the researcher developed several questions to be addressed by creating maps from the results of the data. Questions that were addressed by mapping the survey sample:

- What was the spatial distribution of the population studied, their demographics and exposure to media?
- What were the knowledge deficits with regards to HIV/AIDS?
    - Educational deficits?
    - Confusion of transmission?
    - Lack of understanding of preventive practices?
- What was the perceived severity of HIV/AIDS?
- What was the perceived susceptibility of HIV/AIDS?
- What were the behavioral patterns within the population surveyed?

What was the spatial distribution of the population studied, their demographics and exposure to media?

To display the results using GIS for this question, the researcher constructed composite, GIS maps. The clusters of responses surround each of the six municipalities

or towns used in the study: Acajutla, Armenia, San Julián, San Antonio Del Monte, Nahuizalco, and Nahuilingo. For this question, the symbology used to represent each participant was a triangle. Each triangle seen on the following maps represents a single participant and his/her answer to the question or category displayed at the top of the map. Several examples will be displayed below. All maps that were created can be found in Appendix G. The following map displayed the reading ability among the population. Refer to Figure 9.

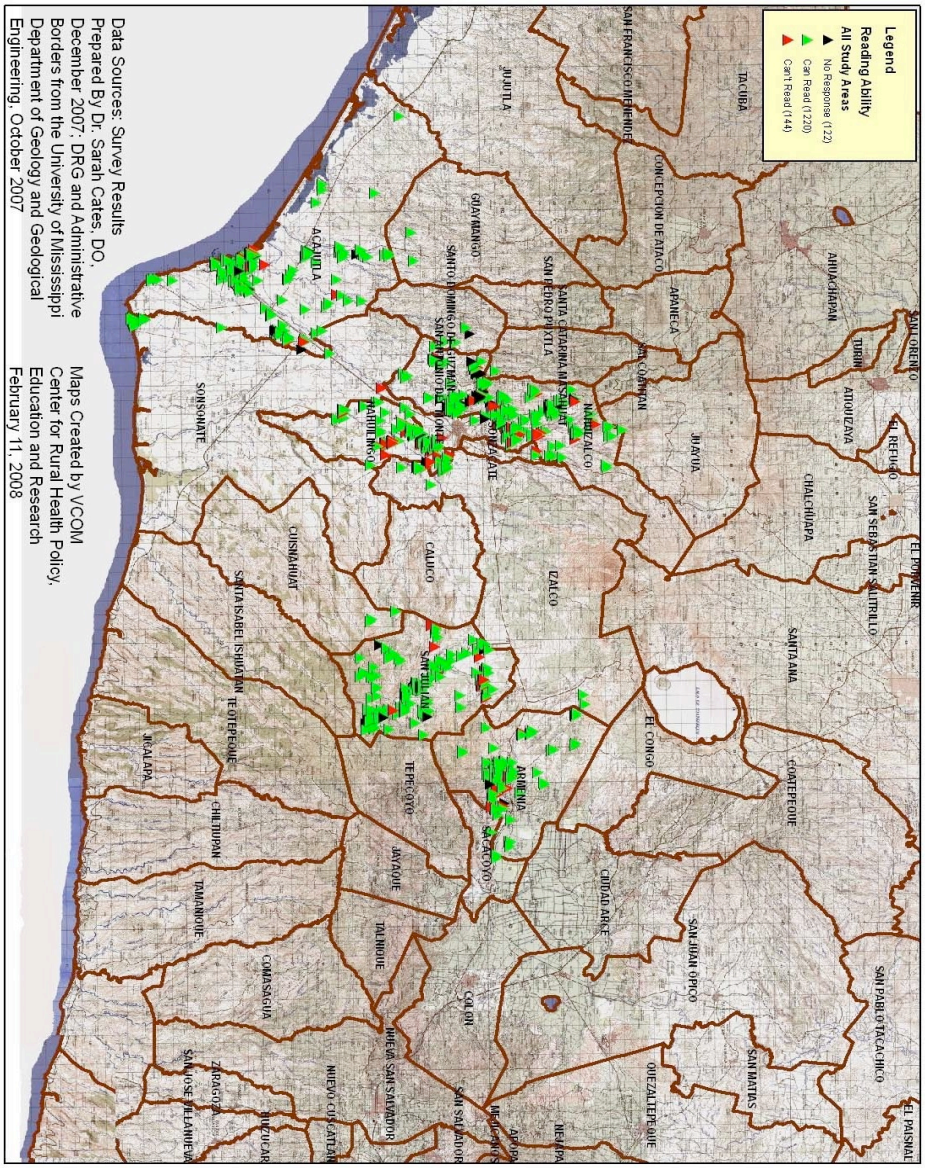

Figure 9: GIS map showing reading ability among the study population.
Black-No response, Green-Can Read, Red-Cannot Read

The GIS map for religion among the general population follows. This map displayed a good example of how GIS mapping could be utilized to show the variation in participant responses among the general population sample. Refer to Figure 10.

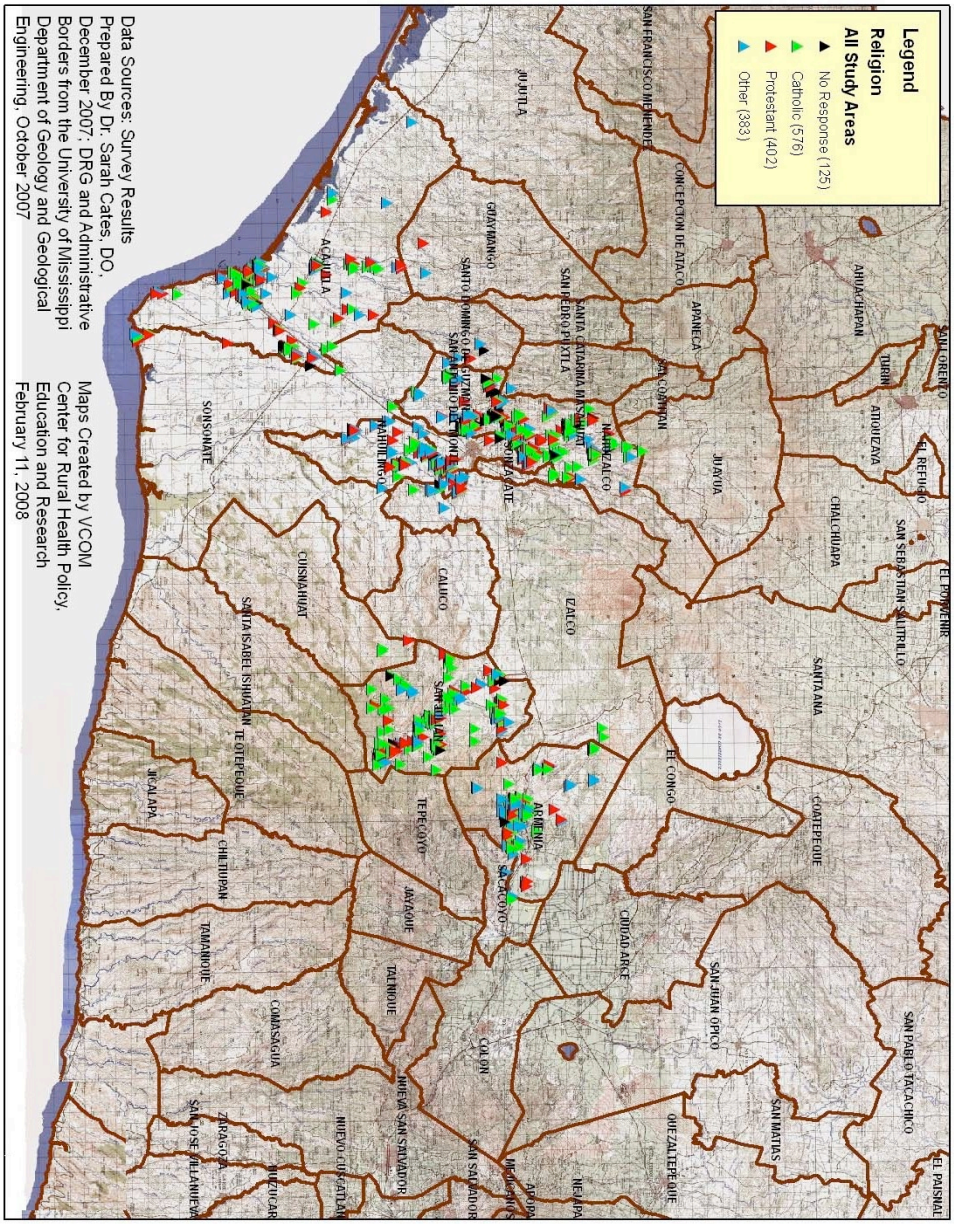

Figure 10: GIS map of the distribution of reported religious affiliations. Black-no response, Green-Catholic, Red-Protestant, Blue-Other (either affiliated with religion other than Christian or did not claim any religious affiliation.

The map of religious affiliation, gave a good indication just how widespread the population was in regard to religious preference. The map clearly displayed a fairly even mix between participants who claimed Catholicism, Protestantism, and Other respectively. The map of the educational background was also important to be able to

identify how educated the people were in each of the areas of the study. It can be seen on the following map that the location of San Julián had a large number of respondents that had finished a secondary education. Refer to Figure 11.

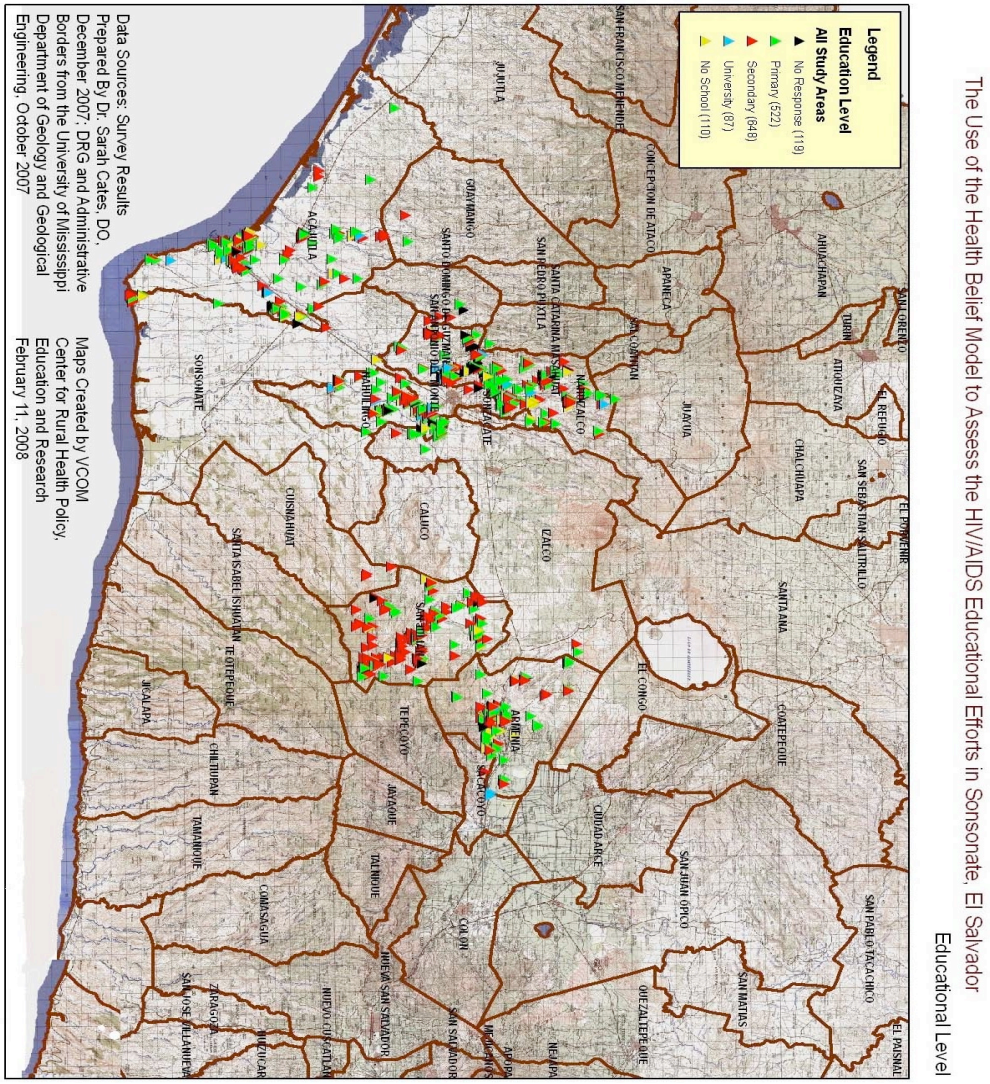

Figure 11: GIS map of education level among the general population. Black-No response, Green-Primary, Red-Secondary, Blue-University, Yellow-No school

Maps were also created to analyze the distribution of ownership and utilization of TV and radio use. Figure 12 shows the distribution of TV ownership within the participant

pool.

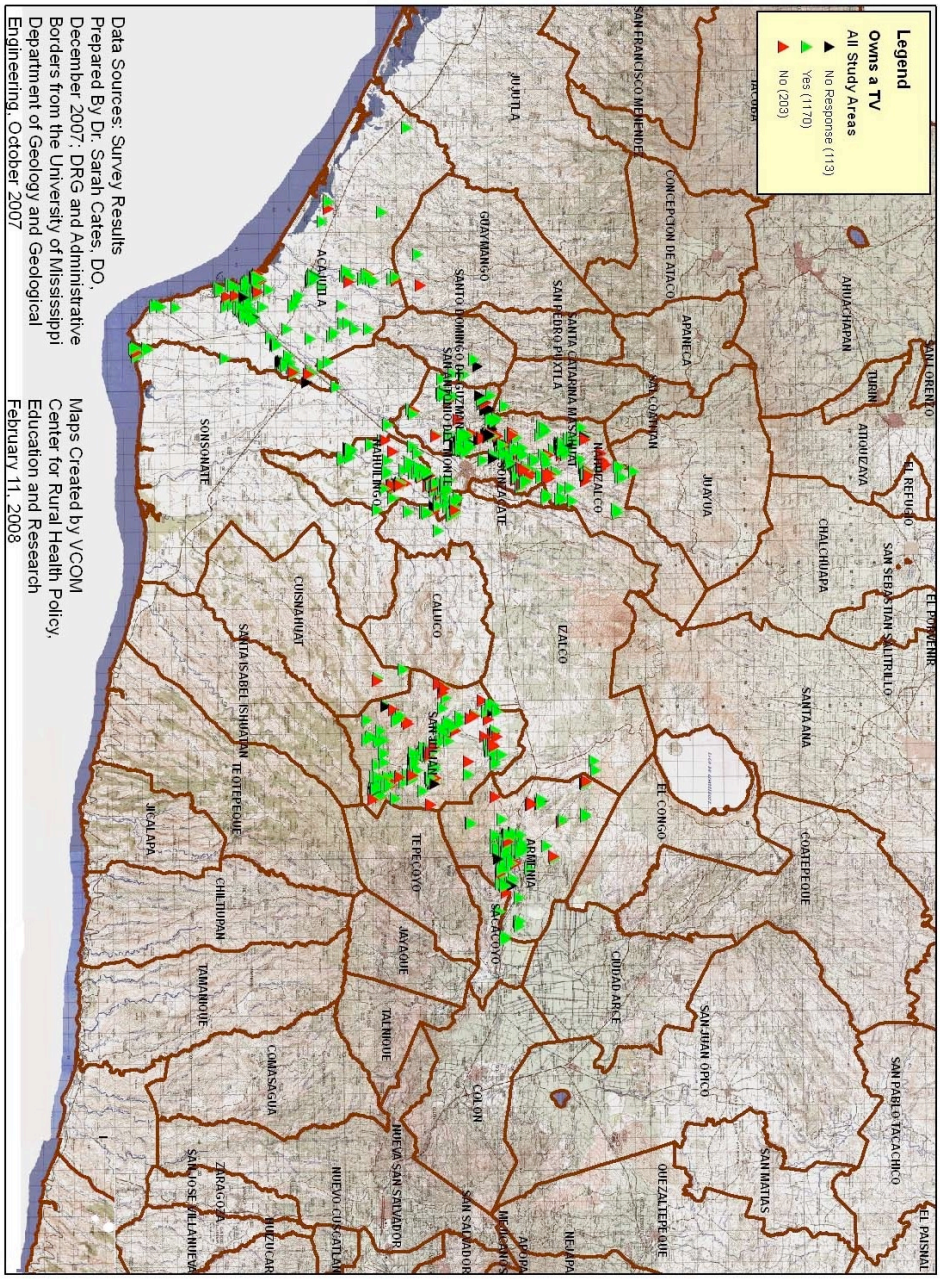

Figure 12: GIS map of ownership of a TV among the general population in the study. Black-No response, Green-Owns a TV, Red-Does not own a TV

While, the overwhelming majority of the participants owned a TV, the use of the GIS mapping revealed that there was a region geographically between Nahuizalco and the San Antonio Del Monte region that had increased instances of participants that did not own a TV. To explore this further, the researcher zoomed in on this region to see if an answer could be found as to why. The following map is a zoomed in map on the region mentioned above. Refer to Figure 13.

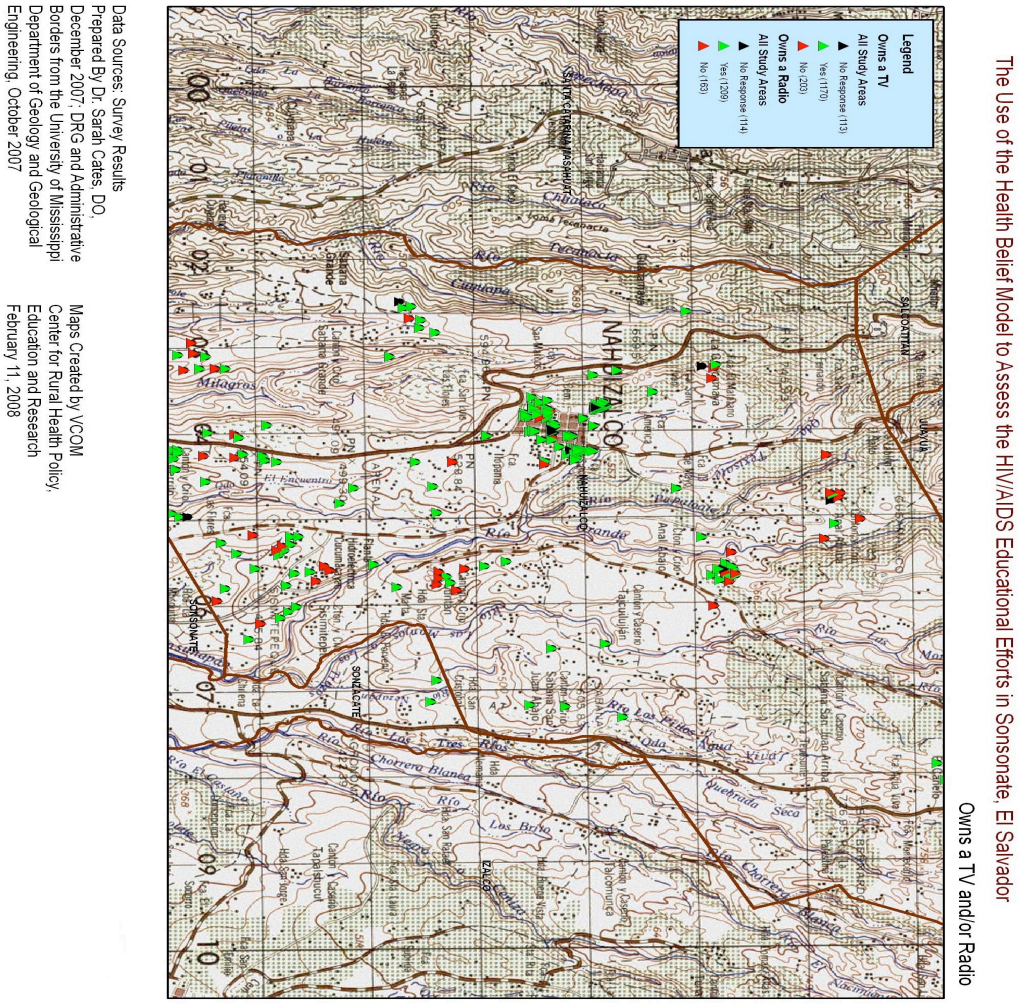

Figure 13: A zoomed-in GIS map of the distribution of ownership of a TV among participants. Black-No Response, Green-Owns a TV, Red-Does not own a TV.

On this zoomed-in version of the map depicting ownership of a TV, it can be seen just how helpful GIS is in interpreting study results. This map showed that the majority of the participants in this area that reported not owning a TV (shown by a red triangle) lived in very mountainous areas. These examples of using GIS mapping to reflected results from this study that adequately addressed the objective of explaining the relationship spatially and graphically among the demographic and exposure to media variables.

What were the knowledge deficits with regards to HIV/AIDS? Educational deficits? Confusion of transmission? Lack of understanding of preventive practices?

The second question addressed using the GIS maps was: What were the knowledge deficits with regards to HIV/AIDS? Educational deficits? Confusion of transmission? Lack of understanding of preventive practices? Again multiple maps were created and they can all be viewed in Appendix G. However, certain maps were included to show examples of what was created. These maps depicted answers to questions that were answered correctly by less than 75% of the participants within the general population. For this objective, the map symbology remained triangles that depicted participant responses. Again, each triangle represented a single participant response. The following map showed the distribution of the population and how they responded to the question: You can get HIV/AIDS from insect bites. Refer to Figure 14.

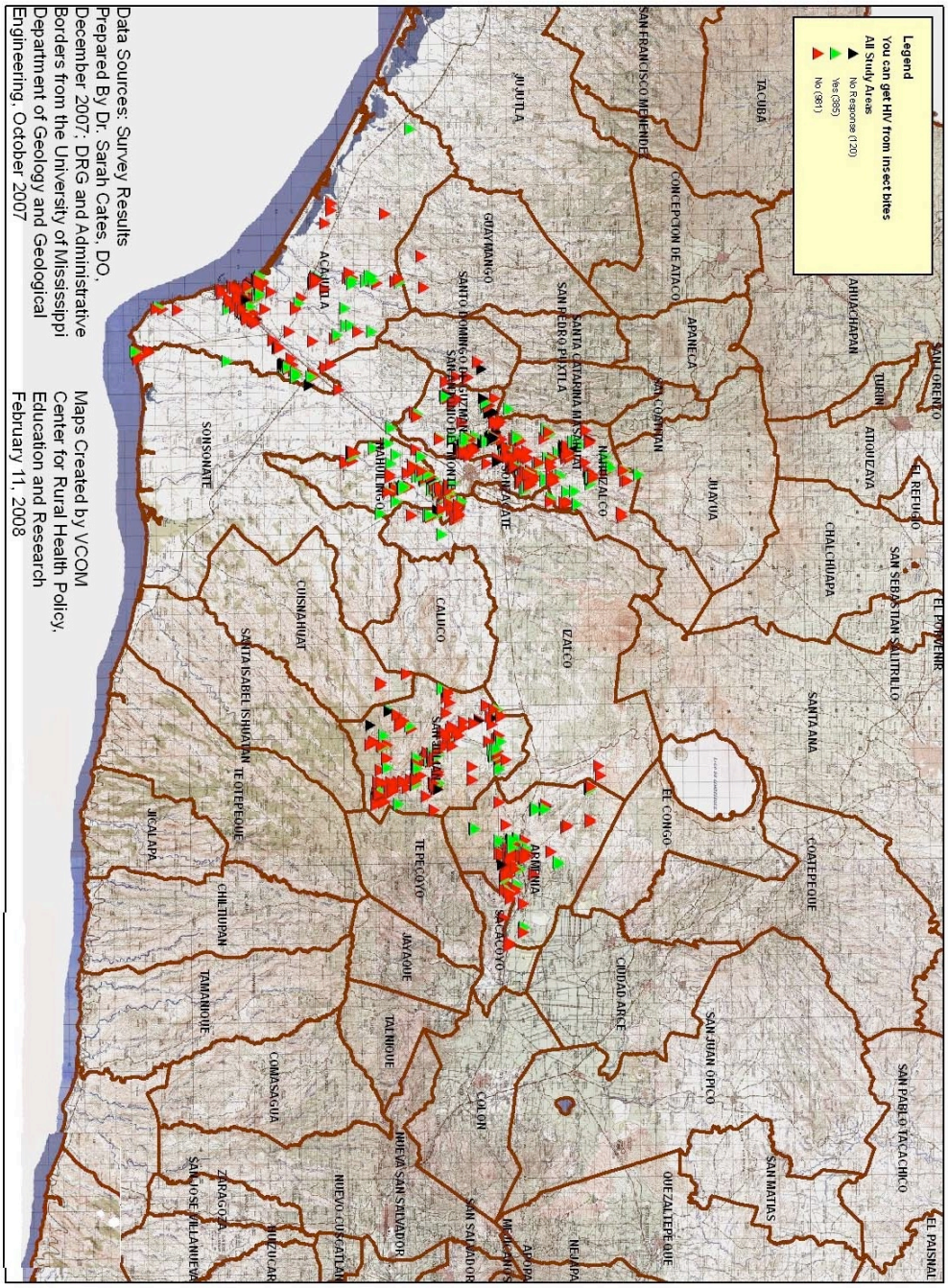

Figure 14: GIS map of participants' response to question: You can get HIV/AIDS from insects. Black-No Response, Green-Yes, Red No

This map showed that despite many governmental efforts at education, basic knowledge on transmission of HIV/AIDS is lacking within this population. Further proof of this fact

came from other maps generated from the questions analyzed as having less than 75% of the participants answering correctly. The following maps showed the distribution of another, fundamental knowledge deficit. The question mapped below was You can HIV/AIDS through an open cut or wound. Refer to figure 15.

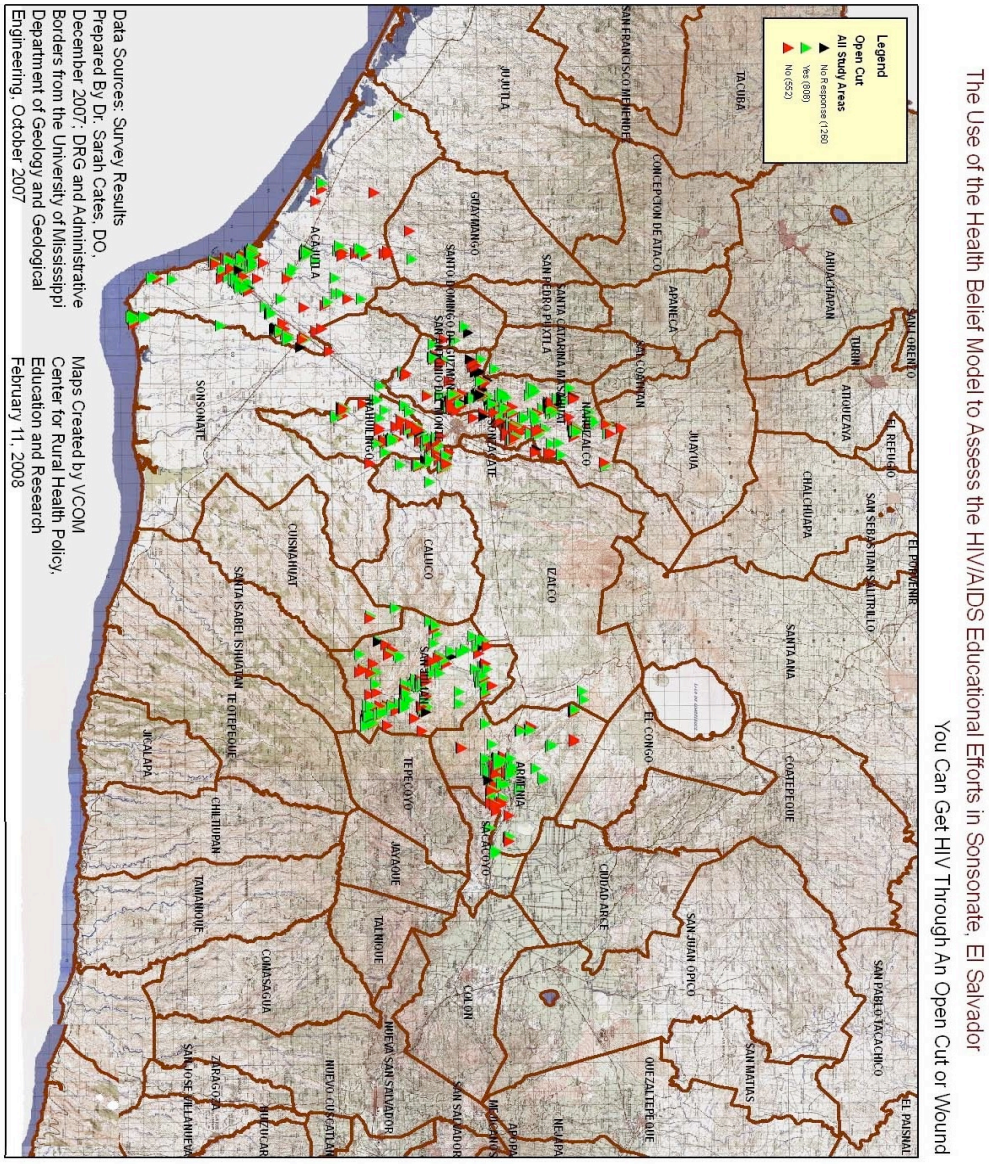

Figure 15: GIS map of the question: You can get HIV/AIDS through an open cut or wound. Black-No Response, Green-Yes, Red-No

Another example from this section is shown below and it is a map of the question: You can get HIV from kissing. Refer to Figure 16.

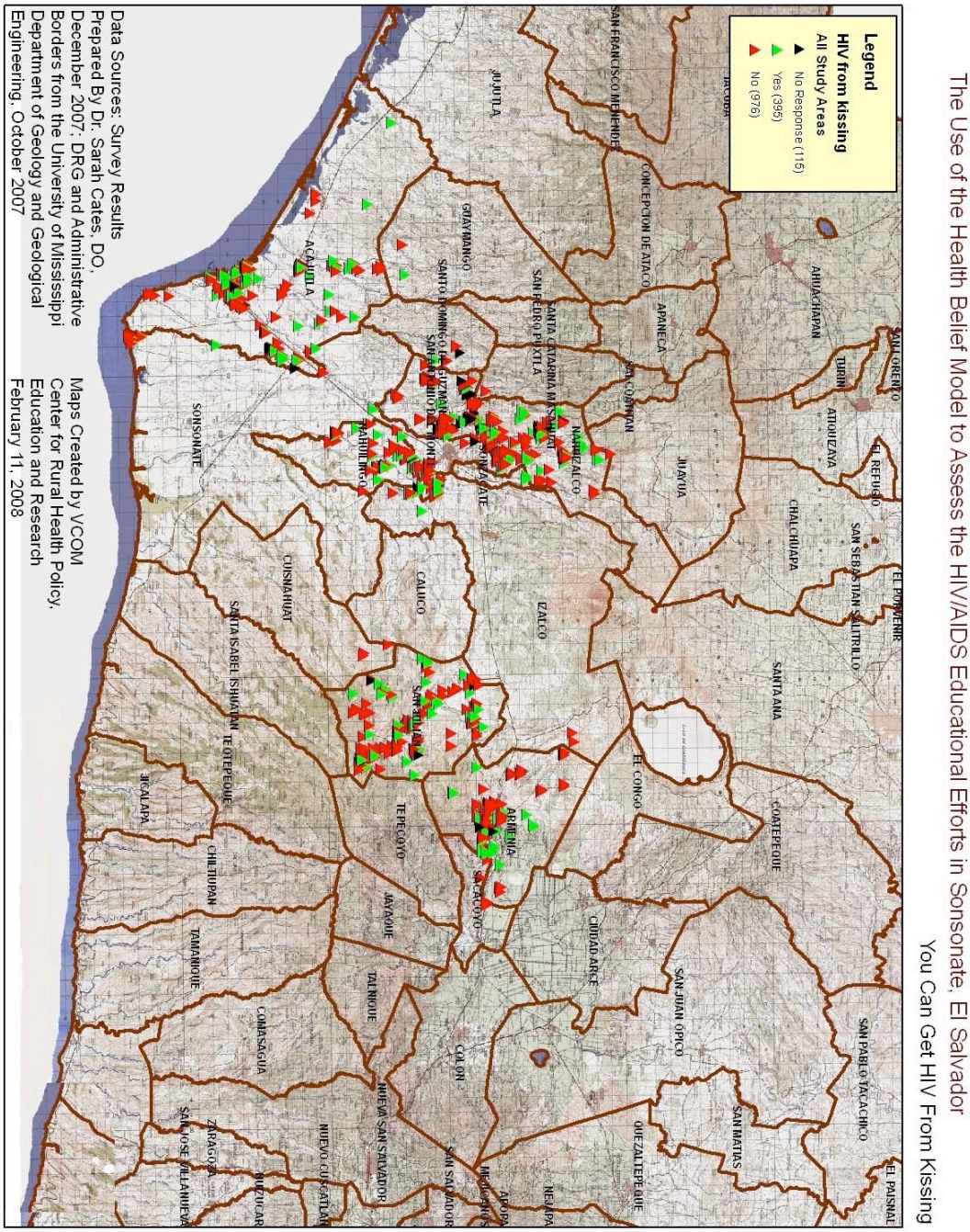

Figure 16: GIS map of the question: You can get HIV from kissing. Black-No Response, Green-Yes, Red-No

With the data that was represented in these maps, the researcher was confident that the research objective to show where the educational deficits and confusion about prevention and transmission existed within the study population.

What was the perceived severity of HIV/AIDS?

The next research question that was answered using GIS mapping was: What is the perceived severity of HIV/AIDS? Several maps were produced to show this and they can be found in Appendix G To answer this research objective, the symbology on the maps was changed to squares for the perceived severity variables and to stars for the perceived susceptibility variables, with each square or star representing a single participant within the general population. The first map was from the perceived severity section and was the distribution of responses to: In your community, how severe a problem is HIV/AIDS? This map showed a good distribution of answers among the six municipalities or towns and among the various answer choices. This map displayed the value of utilizing GIS mapping to pinpoint areas of specific knowledge needs or unique perception deficits. Refer to Figure 17.

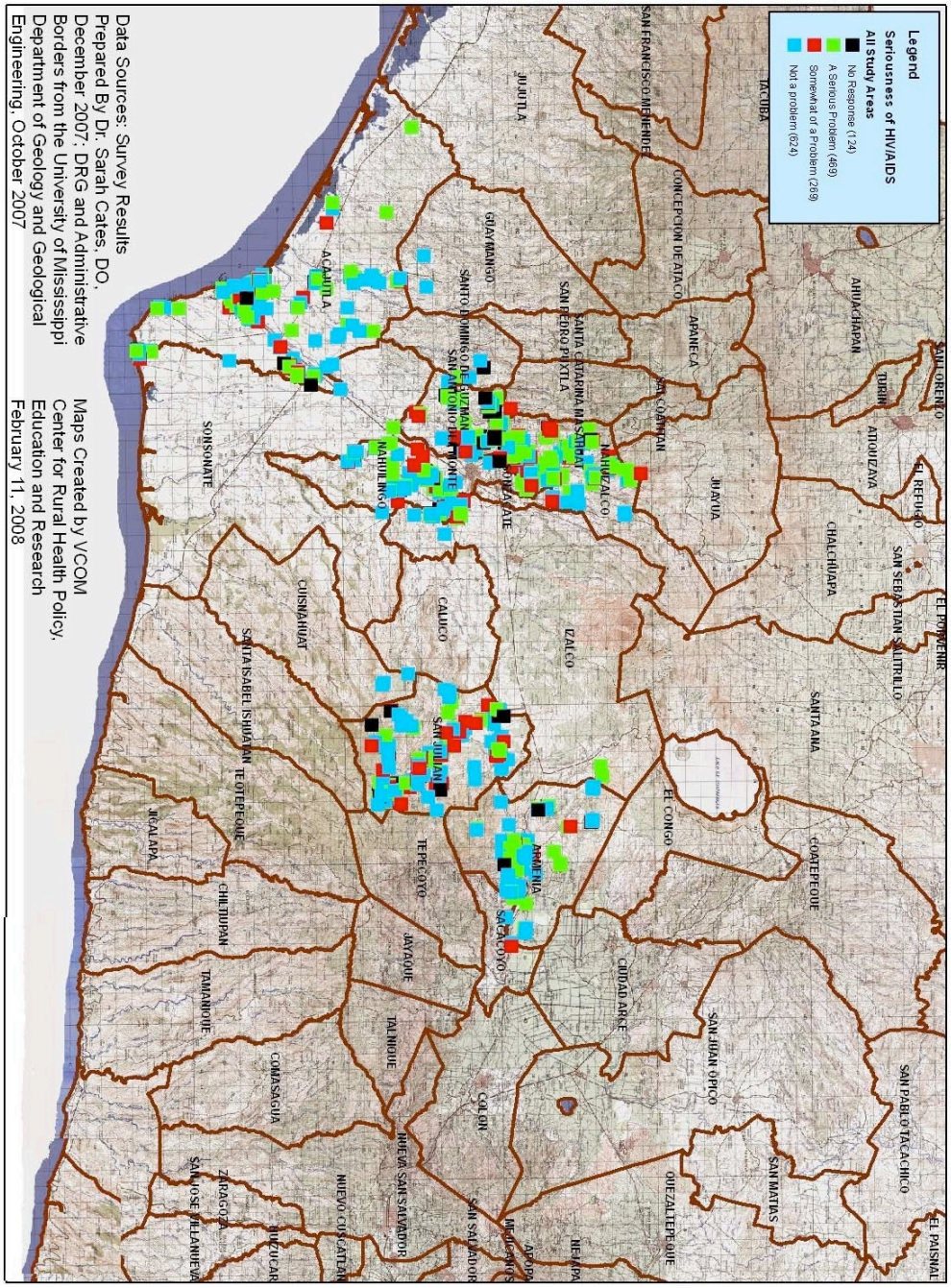

Figure 17: GIS map of the question: In your community, how severe a problem is HIV/AIDS? Black-No Response, Green-A Serious Problem, Red-Somewhat of a Problem, Blue-Not a Problem

The next map depicted another question from the perceived severity section. The question was: There is a good chance I will get HIV/AIDS within the next 5 years. The

answer distribution for this question was recorded in the following map. Refer to Figure 18.

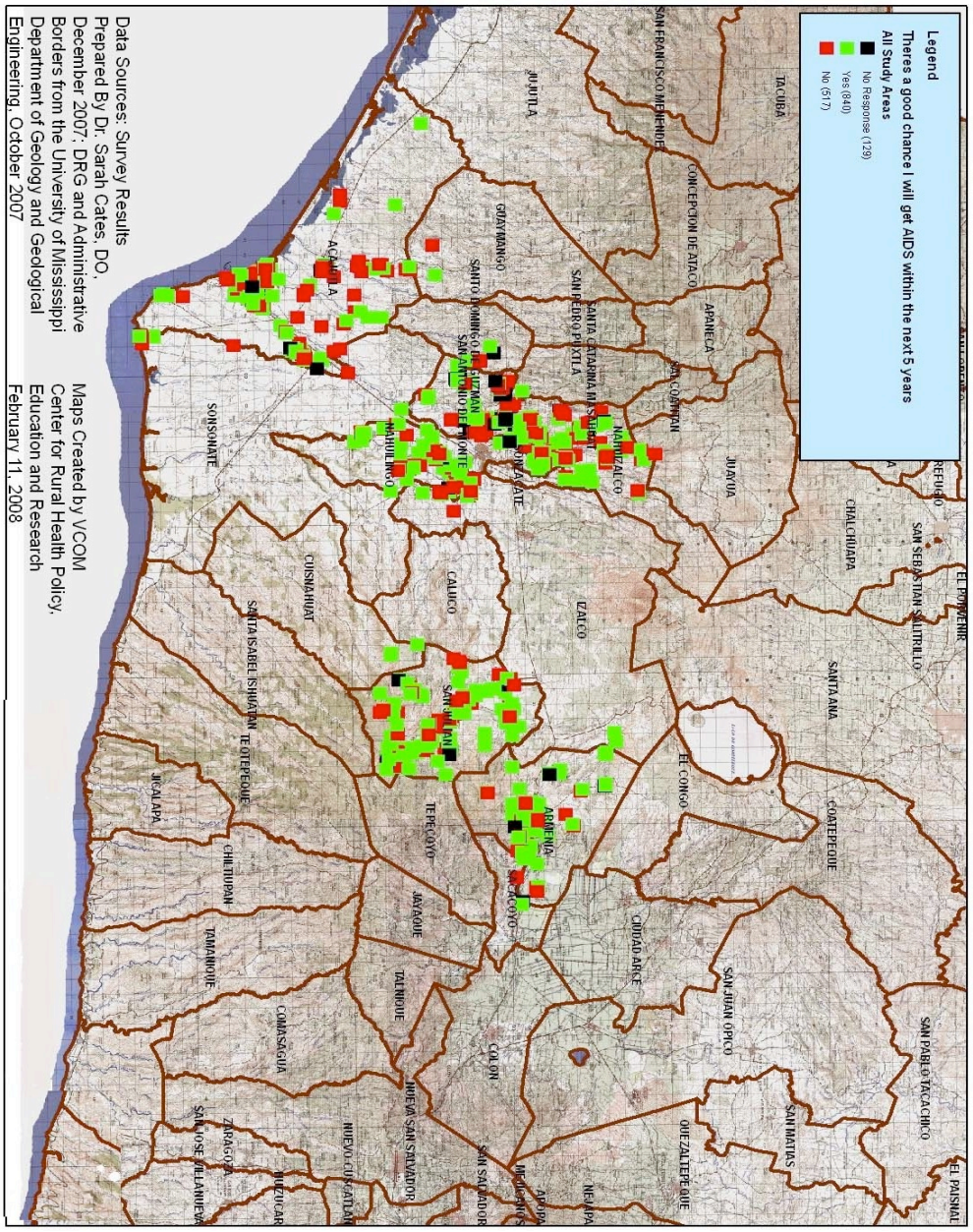

Figure 18: GIS map of the question: There is a good chance I will get HIV/AIDS within the next 5 years. Black-No Response, Green-Yes, Red-No

The next map depicted the responses from a question in the perceived susceptibility section. The question was: I am less likely than others to get HIV/AIDS. The following map showed the response to that question. Refer to Figure 19.

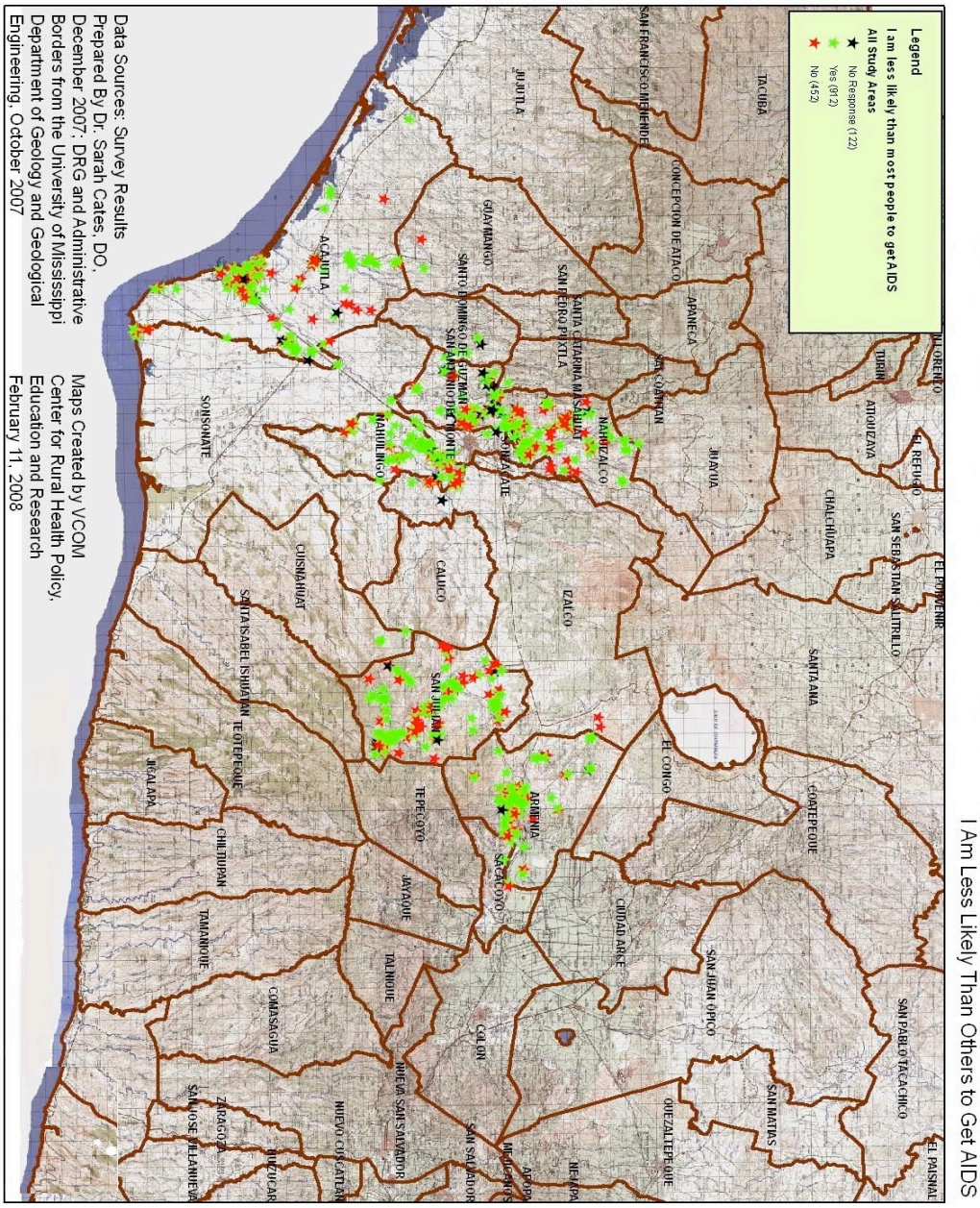

Figure 19: GIS map of the question: I am less likely than other to get HIV/AIDS. Black-No Response, Green-Yes, Red-No

With the maps that were created from the answers to questions contained in the perceived severity/perceived susceptibility section, the researcher felt confident that the research objective to graphically depict the perceived severity/susceptibility level of the general population was fulfilled.

What were the behavioral patterns within the population surveyed?

The next and final research question was: What were the behavioral patterns within the population surveyed? This objective was mapped using GIS mapping and the researcher changed the symbology for this objective to diamonds for representation of the participants. Each diamond represented a single participant. All of the maps created for this section can be viewed in Appendix G. Two maps are shown below as examples of the maps created to answer this research objective. Both maps dealt with questions from the behavior section, which analyzed participants' engagement in sexual behaviors. The following map represented the answers to the question: In the past 6 months: I have had vaginal intercourse without a condom. Refer to Figure 20.

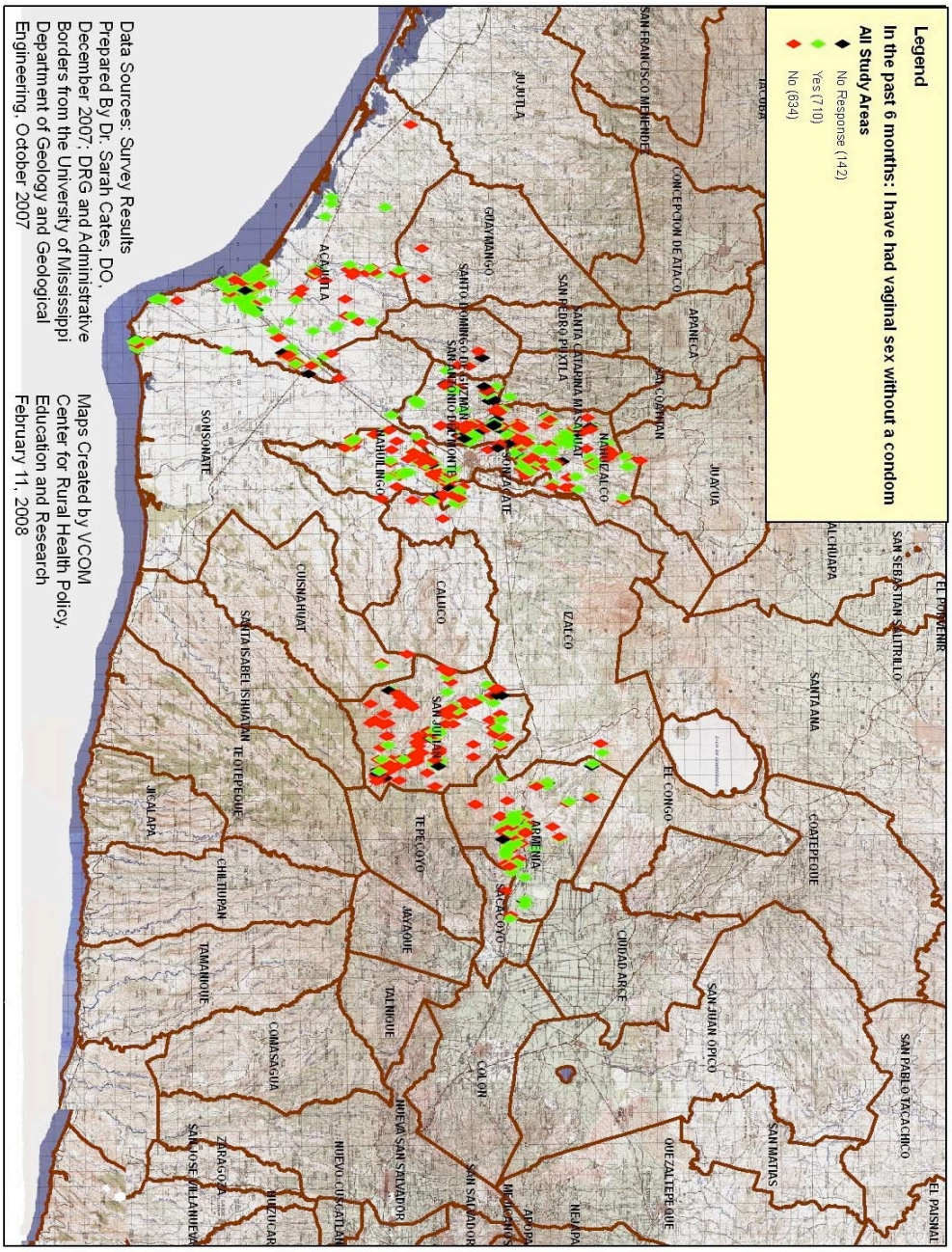

Figure 20: GIS map of question: In the past 6 months I have had vaginal intercourse without a condom. Black-No Response, Green-Yes, Red-No.

One more map from the behavior section will be shown. The next map represented the distribution of answers to the question: I have had an HIV test. This map showed the

definite pockets of participants that had and had not yet been tested for HIV. Refer to Figure 21.

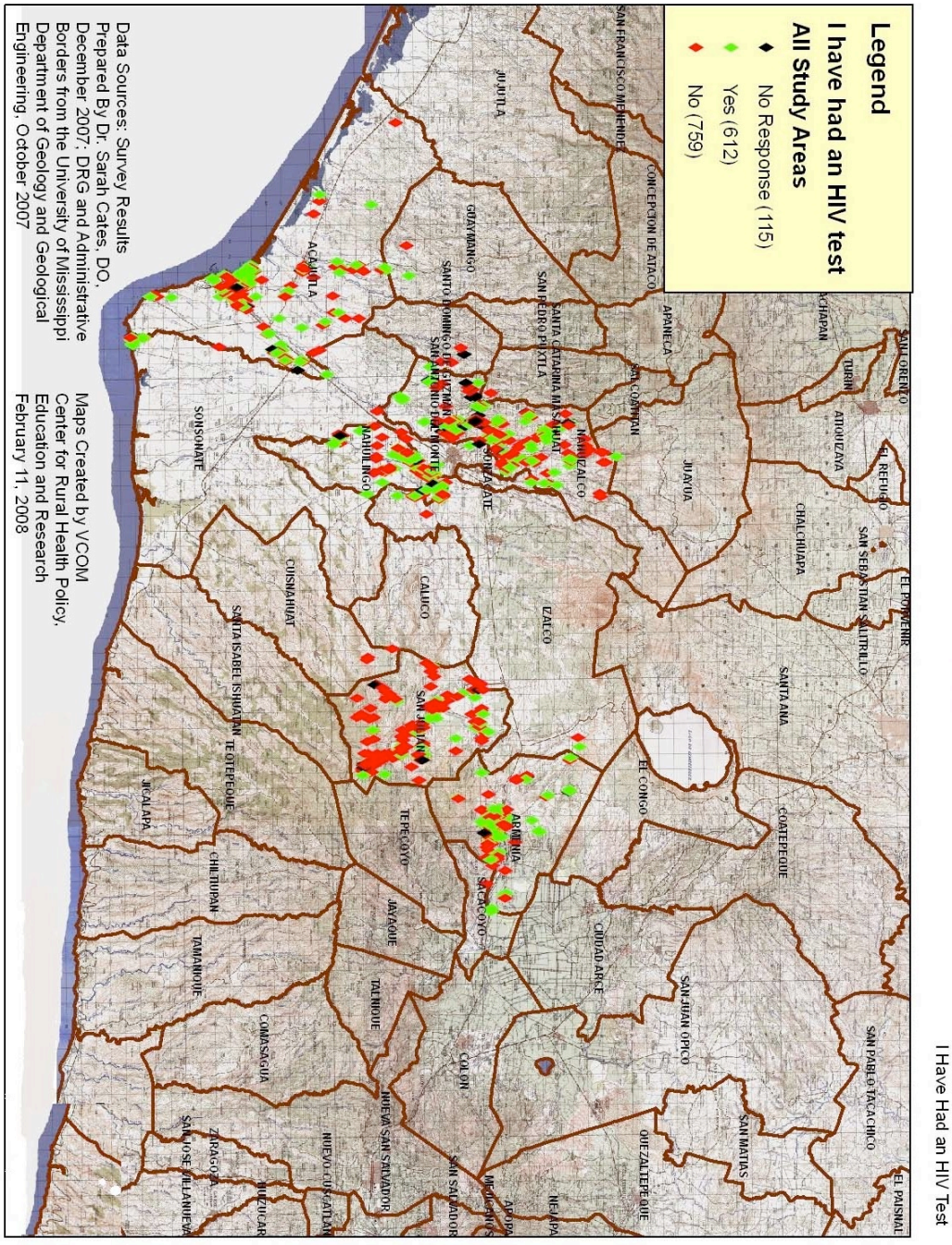

Figure 21: GIS map of the question: I have had a HIV test. Black-No Response, Green-Yes, Red-No

With the compilation of the maps created from the questions in the behavior section, the researcher was satisfied that this final research objective had been successfully addressed.

Summary

The results from this study varied from descriptive to pictorial and the researcher utilized various statistical and pictorial tools to analyze the information. By utilizing various methods, the researcher was able to clearly address each research question outlined for this study completely with the results that were created. The research questions for this study were:

1. What was the current knowledge level of HIV/AIDS causes, prevention, and transmission among a population ringing from 15-39 and a population of physicians in 6 cities in El Salvador?
2. How did the measure of perceived severity, perceived susceptibility, and participation in risky behaviors relate to each other and to knowledge level for a population 15-39?
3. Where were the areas that have significant knowledge, perception, or behavioral deficits regarding HIV/AIDS within the target population?

Research Question 1

What was the current knowledge level of HIV/AIDS causes, prevention, and transmission among a population ringing from 15-39 and a population of physicians in 6 cities in El Salvador?

The results that were compiled to answer this question included descriptive statistics that described both populations within this study, the general population 15-39 and the physician population. A knowledge (k) index was also formulated so that individual

responses to instrument items could be aggregated into a single variable measuring a value from 0-1. This index showed that the general population, overall had correct response rate of 78% on the knowledge section and the physician population had a correct response rate of 98.9%. A further analysis of the responses from both populations occurred and revealed that despite relatively high average, correct response rates, significant portions of each population had serious knowledge deficits concerning HIV/AIDS prevention and transmission.

Research Question 2

How did the measure of perceived severity, perceived susceptibility, and participation in risky behaviors relate to each other and to knowledge level for a population 15-39?

To answer this question, again descriptive statistics were used so that the frequencies and percentages could be effectively and appropriately recorded. In addition to the knowledge (k) index that was calculated for the previous question, an additional behavior (b) was also calculated to achieve the same goal of aggregating responses into a single variable with the values of 0-1. Then a more in depth analysis ensued to effectively answer this research question. Regression analysis was undertaken to explore significant correlations between the various sections, demographics/exposure, knowledge, perceived severity/susceptibility, and behavior. The correlations were divided into three categories and each category produced multiple, significant correlations from the data. These correlation findings provided a sense of where this population fell along the Health Belief Model (HBM) continuum from knowledge to safe behavior.

Research Question 3

Where were the areas that have significant knowledge, perception, or behavioral deficits regarding HIV/AIDS within the target population?

To answer the question of where, the researcher utilized Geographical Information System (GIS) software. The researcher strongly felt that merely reporting the results from this study with numerical values would do an injustice to this research. With the goal being to provide the information so that future educational efforts could be implemented and successful, the researcher wanted to show the specific areas of the study population and what specific needs were present in each area. The GIS software allowed the researcher to do just that. Electronic maps were created that highlighted one or multiple variables from the instrument. These maps clearly displayed participant responses and showed trends on a level above mere statistics. These maps physically showed where the individuals live that have false beliefs or deficits in knowledge, perception, or safe behavioral practices. By using these maps, educators could target educational efforts to specific populations because they would have an idea of what the specific educational needs were in each area.

Chapter 5

Conclusions, Recommendations, and Summary

Introduction

The purpose of this study was to gain a comprehensive knowledge about how much the target population knew about the basics of HIV/AIDS transmission and prevention and also to gauge where this population fit within the Health Belief Model (HBM) in regards to perceived severity and perceived susceptibility of HIV/AIDS. All of these components were combined to further evaluate how all of these components combine to determine whether current behavioral patterns could be linked to any of the aforementioned variables. Conclusions and recommendations were made in regard to Figures 4 and 5, which depicted the HBM structure used in this study.

The following three research questions were addressed with this study:

1. What was the current knowledge level of HIV/AIDS causes, prevention, and transmission among a population ringing from 15-39 and a population of physicians in 6 cities in El Salvador?
2. How did the measure of perceived severity, perceived susceptibility, and participation in risky behaviors relate to each other and to knowledge level for a population 15-39?
3. Where were the areas that have significant knowledge, perception, or behavioral deficits regarding HIV/AIDS within the target population?

Chapter 4 reported the results for the research questions and in this chapter, each question will be restated with and section following each one addressing conclusions and recommendations based on the findings from this study.

Research Question 1

What was the current knowledge level of HIV/AIDS causes, prevention, and transmission among a population ringing from 15-39 and a population of physicians in 6 cities in El Salvador?

Conclusions

This first research question focused on the first component of the HBM diagram depicted above in Figures 4 and 5. While overall, the knowledge level was acceptable, 11 questions produced percentages less than 75% of responders answering correctly. These questions are displayed in Table 4 in chapter 4. The 26 questions included in the knowledge section were compiled using strict criteria and from recommendations from other researchers who have conducted similar studies (DiClemente et al., 1988; Koopman et al., 1990; Petosa & Wessinger, 1990). The questions were designed to assess basic HIV/AIDS transmission and prevention knowledge and the questions were subjected to several reviews by professional panels both stateside and in El Salvador prior to initiation of the study. Also, the questions were used in a field study with a sample of the general population prior to the start of the study to ensure clarity and comprehension. With all of these factors in place, the researcher felt that all measures possible were taken to ensure accurate results from this section. As stated in chapter 4, the overall average, correct response rate to this section was relatively high at 78%. However, with further analysis, multiple discrepancies were found in regards to the overall knowledge level among the general population aged 15-39. The results of this portion of the analysis confirmed what the researcher thought would be the knowledge level among this population. A basic understanding of transmission and prevention measures of HIV/AIDS is lacking among

the general population aged 15-39 within the six municipalities or towns included in this study. Within the second population, the 15 physicians included in the study the average correct response rate for the knowledge section was 98.9% correct. However, one question, "You can get HIV through an open cut or wound," produced a correct response rate among the physicians of only 53.3% (8 physicians answering correctly). This correct response percentage correlates to the correct response percentage to this same question among the general population sample, which had a 59.8% correct response rate to the same question. This question shows the depth of the need to better educate this population but also unveils a larger problem in that the health care professionals in this area have a serious knowledge deficit that must be corrected.

Recommendations

Basic HIV/AIDS transmission and prevention knowledge is the foundation needed before any behavior modification could ever be expected. Until this entire population, physicians included, have a solid and correct knowledge about the transmission and prevention of HIV/AIDS it is the researcher's thought that any further efforts not pertaining to this singular goal is pointless. Further efforts are needed that begin again with the basics of transmission and prevention as misconceptions abound, as noted in chapter 4.

Research Question 2

How did the measure of perceived severity, perceived susceptibility, and participation in risky behaviors relate to each other and to knowledge level for a population 15-39?

This second research question focused on how the first, second, and the third components related to each other in respect to the HBM depicted in Figures 4 and 5. This question was answered from the data provided from the section of the study instrument that consisted of the total of 17 perceived severity and perceived susceptibility questions, 14 behavioral questions, and the 26 knowledge questions. Descriptive as well as regression analysis was used to effectively answer this question. After manipulation of the data and running of various regressions, which placed each section, knowledge, perceived severity and perceived susceptibility, and behaviors, as dependent variables many positive and negative correlations were produced. These regressions were conducted in a model that consisted of three factors that were outlined in chapter 4 and revisited below:

1) Demographics and exposure to media affected knowledge about HIV/AIDS.

2) Demographics, exposure, and knowledge in turn affected how susceptible a person deemed to be to HIV/AIDS and how severe a problem he/she thought HIV/AIDS was.

3) Demographics, exposure, knowledge, susceptibility and severity all affected the safe or unsafe behavior of an individual.

Demographics and exposure to media affected knowledge about HIV/AIDS

Conclusions

The results from the regressions of the first model factor produced five significant results. The significant variables included the ability to read, being educated, and having exposure to television, which all had a positive relationship with a higher knowledge about the prevention and transmission of HIV/AIDS. These results were expected by the

researcher and logical. Considering the amount of HIV/AIDS educational information that has been placed into the communities by the El Salvadorian government, one would expect that being able to read, being more highly educated, and having exposure to television would produce a higher, correct knowledge about the transmission and prevention of HIV/AIDS. These results also produced a good indication about this population and its place along the continuum of change in respect to the Health Belief Model (HBM) depicted in figures 4 and 5. These results pointed out that, in deed, this population was impacted by certain cues to action, namely television ads, printed material describing HIV/AIDS prevention and transmission, and school programs that were all initiated by the government in El Salvador (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006). However, an interesting note in this finding was that no religion or radio variables produced any significant correlations among the study population. Therefore, while the significant correlations that were produced helped to solidify this population along the HBM continuum in that it showed that certain cues to action were, in fact, prominent and seemingly influential, the absence of any of the radio variables producing a significant finding weakened this position.

Recommendations

The researcher found that most of the campaigns produced by the government involved either television or print media so then it was the recommendation to produce more campaigns that utilize the radio as an avenue. The ownership and listening frequency of a radio was similar to that of a television among this population. Also, this study demonstrated the effectiveness of utilizing the television with HIV/AIDS

prevention and transmission campaigns and it was the researcher's belief that by creating audio campaigns for the radio could only help raise the knowledge level even more. *Demographics, exposure, and knowledge in turn affected how susceptible a person deemed to be to HIV/AIDS and how severe a problem he/she thought HIV/AIDS was.*

Conclusions

The results from these regressions described how the perceived severity and perceived susceptibility variables compared with the knowledge index and with the demographics. These regressions produced numerous significant variables as the perceived severity and perceived susceptibility variables were run individually and not in an index format. All of the significant variables that were produced for each of the perceived severity and perceived susceptibility variables were represented in table 15 in chapter 4. Most of the significant correlations found were logical and expected by the researcher. Each perceived severity and perceived susceptibility variable was listed with an explanation to the significant correlations with the knowledge (k) index and with the demographics.

- *HIV/AIDS is a serious problem in my community.*

  Significant variables included negative correlations with the knowledge (k) index and with being married and a positive correlation with owning a TV. The knowledge (k) index increases (one is more knowledgeable about HIV/AIDS transmission) then his/her belief that HIV/AIDS is a problem in his/her community decreases. Also, if someone is married then he/she has a lessoned perceived severity or perceived susceptibility in his/her community compared to someone who is single. By owning a TV, one had an increased perception of

HIV/AIDS being a serious problem in his/her community compared to someone who did not own a TV.

- *People in my neighborhood are likely to be infected with HIV/AIDS.*

  Significant correlations included a negative correlation with the ability to read and a positive correlation with being educated. If one could read then he/she was less likely to perceive his/her neighbors as being infected with HIV/AIDS. Respondents with at least a primary education were more likely to perceive neighbors as being infected compared to someone with no schooling.

- *HIV/AIDS is a health risk I take seriously.*

  No significant correlations were produced for this variable.

- *There is a good chance I will get HIV/AIDS in the next 5 years.*

  Significant correlations included negative correlations with reading ability and with being married. Therefore if the respondent could read or if he/she was married they were less likely to think they will get HIV/AIDS in the next 5 years.

- *HIV/AIDS is the scariest disease I know.*

  Significant correlations included a positive correlation with the knowledge (k) index and negative correlations with gender and university education. The higher the participant's knowledge (k) index the more he/she perceived HIV/AIDS as a scary disease. Male participants were less likely to view HIV/AIDS as a scary disease compared to females. If the participant had a university education then he/she was less likely to perceive HIV/AIDS as a scary disease compared to someone with no schooling.

- *I know someone infected with HIV/AIDS.*

No significant correlations were produced for this variable.

- *The number of people with HIV/AIDS is increasing.*

  Significant correlations included a positive correlation with the knowledge (k) index and with being Catholic and a negative correlation with being married. The higher the participant's knowledge (k) index the more he/she perceived the numbers of people with HIV/AIDS to be increasing. If the participant was Catholic, then he/she was more likely to perceive the numbers of people with HIV/AIDS to be increasing compared to someone who claimed no religion. However, if the participant was married, then he/she was less likely to think the number of people with HIV/AIDS was increasing compared to someone who was single.

- *I am afraid of getting HIV/AIDS.*

  Significant correlations included a negative correlation with age and positive correlations with being Catholic and with listening to the radio for 3-4 hours. As the age of the participant increased the fear of getting HIV/AIDS decreased. If the participant was Catholic then he/she was more afraid of getting HIV/AIDS compared to someone who claimed no religion. If the respondent reported listening to the radio for 3-4 hours at a time then he/she was more afraid of getting HIV/AIDS compared to someone who did not listen to the radio at all.

- *I am less likely than most to get HIV/AIDS.*

  No significant correlations were produced for this variable.

- *I know how to protect myself from HIV/AIDS*

Significant correlations included a positive correlation with the knowledge (k) index and a negative correlation with gender. The higher the participant's knowledge (k) index the more likely he/she was to perceive to know how to protect him/herself from HIV/AIDS. If the participant was male then he was more likely to perceive to know how to protect himself against HIV/AIDS compared to females.

- *Someone I know is likely to get HIV/AIDS.*

  Significant correlations included positive correlations with knowledge (k) index, gender, and obtaining a university education. The higher the participant's knowledge (k) index the more likely he/she was to think that someone they know would get HIV/AIDS. If the participant was male then he was more likely to think someone he knows would get HIV/AIDS compared to female participants. If the participant attended a university, then he/she was more likely to think someone they know will get HIV/AIDS compared to some with no schooling.

- *The risk of me getting HIV/AIDS is high.*

  Significant correlations included a positive correlation with ownership of a TV and a negative correlation with being married and being protestant. If the participant owned a TV then he/she was more likely to perceive him/herself as having a high risk of contracting HIV/AIDS compared to participants who reported not owning a TV. If the participant was married then he/she was less likely to perceive him/herself as having a high risk of contracting HIV/AIDS compared to being single. If the participant reported being protestant then he/she

was less likely to perceive him/herself as having a high risk of contracting HIV/AIDS compared to participants who claimed no religion.

- *In comparison to other people my age and sex, I have a higher risk of getting HIV/AIDS.*

  Significant correlations included a positive correlation with the ability to read and negative correlations with being married and with being protestant. If the participant was able to read, he/she was more likely to feel that he/she was at a higher risk of getting HIV/AIDS compared to participants who could not read. If the participant was married, then he/she was less likely to think that he/she was at a higher risk of contracting HIV/AIDS compared to participants who were single. If the participant was protestant, then he/she was less likely to feel that they were at a high risk of contracting HIV/AIDS compared to participants who claimed no religion.

- *I have had sex with a prostitute in the past*

  Significant correlations included negative correlations with knowledge (k) index and with listening to the radio more than 4 hours and positive correlations with gender and age. The higher the participant's knowledge (k) index the less likely he/she was to have had sex with a prostitute. If the participant listened to the radio more than 4 hours at a time, then the chance of he/she having had sex with a prostitute also declined. If the participant was male then the chance of him having had sex with a prostitute was higher compared to being female. As the age of the participant increased, the chance of him/her having had sex with a prostitute also increased.

- *I have a high chance of getting HIV/AIDS because of my past history.*

  Significant correlations included negative correlations with the knowledge (k) index and being protestant and positive correlations with gender and age. The higher the participant's knowledge (k) index the less he/she perceived him/herself as having a high chance of getting HIV/AIDS based on past history. If the participant was protestant, he/she was less likely to perceive him/herself as having a high chance of getting HIV/AIDS based on past history compared to someone who claimed no religion. If the participant was male, he was more likely to perceive himself as being at risk of HIV/AIDS because of his past compared with female participants. As the age of the participant increased the likelihood that he/she perceived him/herself as having a higher chance of getting HIV/AIDS based on past history also increased.

- *I know how to have safe sex.*

  Significant correlations included negative correlations with the knowledge (k) index, gender, age, being married, and having a university education and a positive correlation with being Catholic. The higher the participant's knowledge (k) index, the more he/she was to perceive that he/she knew how to have safe sex. If the participant was male, then he was likely to perceive to know how to have safe sex compared to being female. As the age of the participant increased, the perception of knowing how to have safe sex also increased. If the participant was married, he/she was more likely to perceive to know how to have safe sex compared to single participants. If the participant had attended a university, then he/she was more likely to perceive to know how to have safe sex compared to

participants who did not have any schooling. If the participant was Catholic, then he/she was more likely not to perceive how to have safe sex compared to participants who claimed no religion.

Most of these explanations and findings are logical and within the realm of what was expected among this population. However, several exceptions and interesting correlations are worthy of further explanation.

The second variable, *People in my neighborhood are likely to be infected with HIV/AIDS,* produced contradictory correlations. The first correlation was logical in that if the participant was able to read then he/she was less likely to perceive his/her neighbors as being infected. Equating literacy with education, this correlation stated that when a participant was more highly educated then he/she had the stated perception. However, the next correlation contradicted that assumption by stating that participants that had higher education levels were more likely to perceive their neighbors as being infected with HIV/AIDS. Secondary to this contradiction the researcher dismissed this finding in its entirety.

The next correlation that produced illogical or contradictory results was the fifth variable, *HIV/AIDS is the scariest disease I know.* This variable produced three significant correlations. The first dealt with the knowledge (k) index and it was logical. The second correlation dealt with being male and being less likely to view HIV/AIDS as a scary disease. This correlation may have resulted from the relatively small *n* size of males (351 or 24.4%) in this study. The researcher could not explain why one gender would or should have produced this response. Therefore, this finding was thrown out for

any final findings. The last significant correlation for this variable was regarding having obtained a university education. This finding was logical as with higher and higher education comes an overall view of HIV/AIDS as a disease that is well understood and preventable, thus less scary.

The next variable that produced illogical correlations was, *The number of people with HIV/AIDS is increasing.* This variable produced a total of three correlations. The first correlation was logical in its findings. The second correlation dealt with the finding that if participants reported being Catholic then he/she would be more likely to feel that the numbers of people with HIV/AIDS was increasing. The researcher could not explain why one religious affiliation would be significant and the others not. The distribution between religions was more evenly distributed in this sample compared to national numbers for El Salvador. Estimates of religious affiliations for El Salvador routinely place 80% of the population in the Catholic category with the other 20% falling into a generic other category, which includes Protestantism and all other religious affiliations. This study contained a sample that boasted 620 participants or 43.4% who reported affiliation with the religion of Catholicism. Another 413 or 28.9% of participants reported belonging to the Protestant religion, which was explained as any other Christian denomination. A third category, Other, was used and explained to be affiliation with religion other than Christianity or the participant was instructed to choose this if he or she did not claim any religious affiliation. This category produced 397 or 27.8% of the sample in the study. The number of participants in this study who claimed Catholicism as their religion fell well below the national average of 80%. Also, the number of participants that fell into the protestant category also exceeded the normal values seen

within this country as a whole. Despite all these factors, several variables were significant with either the Catholic or the Protestant population of people. Whether or not these correlations were directly correlated to religious affiliation could not be determined. As in the present example, only the Catholic population was significant for this variable. The protestant and the other populations were not significant. This led the researcher to treat this and all significant variables involving religion to be merely antecdotal. The third variable that produced significant correlations for this variable was whether or not the participant was married. This correlation was logical and accepted by the researcher.

The next variable that produced seemingly illogical correlations was, *I am afraid of getting HIV/AIDS.* The first significant variable found dealt with age. This correlation was logical and accepted by the researcher. The second significant correlation was involving religion. Again, as stated above, the significant correlations that pertained to religion posed unclear results to the researcher and they were all accepted as anecdotal in nature. The last variable that was significant was one that pertained to listening to the radio for 3-4 hours at a time. This result was viewed as an outlier by the researcher. No other radio variable was significant and so the researcher disregarded this result in any final conclusions about the data.

The next variable that produced contradictory or unclear results was, *I know how to protect myself from HIV/AIDS.* This variable produced two significant results. The first one dealt with the knowledge (k) index and was accepted by the researcher. The second one related to gender of the participant. It showed that if the participant was male then he would be more likely to know how to protect himself against HIV/AIDS compared to females. Again, the researcher noted that the sample size of 351 or 24.4% could have had

an impact on this result. However, the researcher accepted this result and used it with final conclusions.

Someone I know is likely to get HIV/AIDS, was the next variable that produced correlations in need of some explanation. The first correlation dealt with the knowledge (k) index and this correlation was logical and accepted by the researcher. The next correlation warranted further explanation. It dealt with gender and its effects on this variable. Again, this pointed to being male as a correlate to the variable. The researcher felt that the sample size of males within this population probably influenced this result and thus did not accept this finding in any final conclusions. The third correlation that was significant for this variable was having a university education. This finding may be accurate but the researcher felt that since no other education variable was significant for this correlation that this may have resulted in significance secondary to low *n* size of the population that had obtained a university education. This result was rejected in all final conclusion discussions.

The next variable with significant correlations that warranted explanation was, *There is a medium to high risk of me getting HIV/AIDS.* The first significant correlation was logical and accepted by the researcher. It dealt with ownership of a TV. The second variable with significance was also logical and accepted by the researcher. It pertained to being married. The third, however, raised concerns. It pertained to claiming Protestantism as the participant's religion. As stated above, since when religion correlations produced significant correlations but did not do so with all religion choices, the researcher questioned the validity of this finding. Thus, all significant correlations that pertained to a religion variable was not accepted or included in any final conclusions.

The next variable with significant correlations in need of explanation was, *I have had sex with a prostitute in the past.* The first correlation dealt with the knowledge (k) index. It was logical and accepted by the researcher. The next correlation pertained to listening to the radio more than 4 hours at a time. Since no other radio variable showed significance, the researcher dismissed this finding from any final conclusions. The next variable pertained to being male. While this correlation was logical to the researcher, another factor superseded which led to the researcher dismissing this correlation from any final conclusions. The population of participants that answered affirmatively to this question was predominantly male, approximately 70 out of the total 100. However, the other 30 were female. This led the researcher to conclude that possibly this question was not clear and thus threw out the results entirely. The fourth significant correlation pertained to age. This was a logical result and it was accepted by the researcher.

The final variable that produced somewhat questionable correlations was, *I know how to have safe sex.* This variable produced six significant correlations. The first four pertained to the knowledge (k) index, gender, age, and being married. All four of these correlations were logical and accepted by the researcher. The fifth significant correlation pertained to having had a university education. Since no other education level produced significant findings and the sample of participants who actually had a university education was so small, these results were dismissed and not included in any final conclusions. The last correlation that was significant pertained to religious affiliation. As stated before, the researcher dismissed all significant correlations that pertained to religion.

Three variables, two perceived severity and one perceived susceptibility, did not produce any significant correlations with either the knowledge (k) index or the demographic variables. These three variables were; *HIV/AIDS is a health risk I take seriously, I know someone infected with HIV/AIDS, and I am less likely than most people to get HIV/AIDS.* All other perceived severity and perceive susceptibility variables produced multiple significant correlation. The researcher could not determine why these variables did not produce significant findings. The variables were subsequently excluded in their entirety from any and all final conclusions.

Many variables from the perceived severity and perceived susceptibility section produced significant findings. A total of thirteen variables produced at least one significant correlation. However, as the above section explained some of the significant correlations found were dismissed secondary to concerns from the researcher about validity.

Recommendations

This study produced multiple significant correlations between variables pertaining to perceived severity and perceived susceptibility of this population to HIV/AIDS and this population's knowledge and also demographic data. The results from this study concluded that certain variables from the perceived severity/perceived susceptibility section were more highly correlated with knowledge and demographics than others. A total of 28 significant correlations were produced and accepted by the researcher that pertained to the impact of the perceived severity and perceived susceptibility on knowledge and demographics within the sample. The most frequent significant correlation was that of the knowledge (k) index with the various perceived

severity/perceived susceptibility variables. Out of the thirteen variables that produced significant correlations, seven of them produced a significant correlation with the knowledge (k) index. This recurring finding demonstrated just how much a solid and accurate knowledge about HIV/AIDS transmission and prevention had on this population's perceived severity/perceived susceptibility variables. Along the continuum of the Health Belief Model (HBM), displayed in Figures 4 and 5, it is clearly shown how important the relationship is between knowledge and perceived severity and perceived susceptibility. According to this model, the relationship between these two components is crucial to continue along the continuum towards behavior change. With all this in mind, the evidence that this population had a reasonably significant relationship between the knowledge portion and the perceived severity/perceived susceptibility portion demonstrated a move of this population along the continuum toward behavior change according to the HBM. This finding helped to prove the researcher's goal of determining where the population was along the HBM continuum.

The other significant correlations helped to reinforce the findings related to the knowledge (k) index. These significant correlations pertained to demographic information collected on all participants.

The researcher recommended that this portion of the research findings be added to the other elements so that a clear understanding of the findings could be achieved. Also, further research should be conducted to determine significant findings that were lacking in the present study. A further exploration of religious affiliation and its implications on knowledge and perceived severity/perceived susceptibility would be helpful in the production of educational efforts that were culturally sensitive and respectful. This was a

goal of the current research project, however, conflicting results were produced and thus the information was excluded entirely.

Demographics, exposure, knowledge, perceived susceptibility, and perceived severity all affected the safe or unsafe behavior of an individual

Conclusions

The results from the regressions of the third model factor produced twelve significant results. These included the knowledge (k) index, gender, ability to read, being Catholic or Protestant, having exposure to TV, and five significant correlations from the perceived severity/perceived susceptibility section. The findings from the regressions on this section were explained in detail in chapter 4. Of these findings, six were deemed logical by the researcher and accepted without further scrutiny. The other six, significant correlations were further scrutinized to determine whether or not each one's findings were logical within the scope of this study.

The first of these findings was the significant correlation of reporting Catholicism or Protestantism and its positive correlation with engaging in safe behaviors. In the previous model item, religious affiliation produced contradictory results and thus all variables that produced a significant finding with religion was simply rejected from any final conclusions. In this model item, however, reporting and affiliation with Catholicism and Protestantism both produced a significant correlation. (Note: these items were coded in such a way that correlations were determined in a manner where the answers from the participants were compared to someone to claimed no religious affiliation. Ex: if 620 participants reported being Catholic, then when this result was regressed on behavior the correlation was being Catholic compared to someone who reported no religious

affiliation.) Since this was the case, the researcher accepted these correlations as displaying a uniform impact on the population's behavioral practices.

The next set of variables that prompted further exploration were the ones that concerned exposure to TV. The first significant correlation with TV exposure reported that watching any TV made someone behave unsafely more. That might have seemed like a logical correlation since exposure to TV exposes the viewer to not only the targeted media, educational campaigns explained earlier but also to all the promiscuity and unsafe practices that flood many TV programs daily. However, the next significant correlation helped to contradict the previous finding. It pertained to watching TV 30 minutes to 1 hour at a time. Which was significant to make someone behave safer compared to someone who watched TV 30 minutes or less. This finding contradicts the previous one entirely. Also, no other TV exposure variable was significant for either safe or unsafe behavioral practices. The researcher took the conflicting findings as sufficient reason to dismiss this significant correlation entirely.

The next significant variable that needed some explanation and further thought pertained to the report of the ability to protect oneself against HIV/AIDS. This variable was significant and showed that participants who responded with a self-acclaimed knowledge of how to protect themselves behaved unsafely more compared to participants who responded that they did not know how to protect themselves. This finding seemed contradictory at first. However, with further thought, this was a logical finding as well. A participant that knew how to protect him/herself may very well have participated in more unsafe behaviors because of this knowledge, ie anal sex, oral sex, sex with multiple partners. This variable unfortunately did not explore whether the participants that

reported knowing how to protect themselves actually did protect themselves during sexual encounters. This variable was accepted by the researcher and included in all final conclusions.

The final variable that was significant but yet needed some additional scrutiny pertained to participants who reported knowing someone with HIV/AIDS and that negative correlation to safe behavior. This correlation was explained that these respondents would behave unsafely more compared to those who reported not knowing anyone who had HIV/AIDS. Maybe this population of people that reported knowing someone with HIV/AIDS had associations with people that were high risk of HIV/AIDS because of lifestyle, occupation, drug use, etc. Then this population of participants would also be more likely to behave unsafely themselves. After taking all of that into consideration, the researcher accepted this correlation into all final conclusions.

Recommendations

This section of the study built on the findings from the previous sections. These findings pertained to the final piece of Health Belief Model (HBM) continuum depicted in Figures 4 and 5. Behavioral change, in the context of the HBM, is the goal of any educational effort and the gauge chosen by which to measure this population in this study. The findings of this study produced ten significant correlations that pertained to behavioral practices as it related to knowledge (k), demographics/exposure, and perceived severity/susceptibility. Of these findings, five significant correlations were associated with the study population behaving safely. The other five significant correlations pertained to the study population behaving unsafely. The researcher was

satisfied that this population was successfully placed along this continuum regarding behavioral change.

Since this study produced such useful data, tailored efforts should be pursued for this population of people. Specific areas of weakness were uncovered but also specific strong areas were also discovered that warrant further educational efforts.

Research Question 3

Where were the areas that have significant knowledge, perception, or behavioral deficits regarding HIV/AIDS within the target population?

Conclusions

To address this question of where, the researcher chose to utilize an electronic mapping software that used Geographical Information Systems (GIS). With this software, the researcher was able to transform numerical data into tangible maps that displayed each participant's response individually and also the relative location of each participant's residence. All maps produced to date can be viewed in Appendix G. This sum total of this study's data was compiled into a series of maps that can be viewed separately or overlaid on each other electronically to show trends in particular populations or regions. This software capability allowed the researcher to construct any type of map needed. This element of the study was extremely valuable for future efforts at education in this region. The maps that were produced displayed participants' responses in a manner so that with a quick glance, one could determine areas of increased need. Not only does increased need become clearly displayed by utilizing GIS software in this type of study, but also specific educational needs become clearly apparent. Not only does the analyst see that an educational need exists, but rather he or she can clearly see

and know the exact nature of that need. An example of this can be easily seen from the sample GIS map, Figure 13, presented in Chapter 4. This GIS map depicted the responses produced by the population to the question: You can get HIV/AIDS from insect bites. This map went further than merely giving the descriptive results of 385 participants responded wrongly and 981 participants responded correctly. This GIS map showed exactly where both populations of responders live. This information is so valuable because a static statistic that reported that 385 participants answered this question falsely may or may not prompt action from an educational body to address this issue. However, with this GIS capability, the researcher was not only able to produce the statistics but also to show where those individuals live. This should make targeting educational efforts much more effective.

Recommendations

The researcher included this component in this study because changing behaviors was the ultimate goal. This entire study focused on the importance of education as the proper foundation to propelling a participant or group of participants along the Health Belief Model (HBM) towards behavioral change. The researcher recommends that by using the GIS maps produced from the data of this study, more efficient and targeted HIV/AIDS educational efforts need to be produced so that this population's deficits are addressed regardless of where they are, knowledge or perceived severity/perceived susceptibility. By meeting this population where they are, the researcher is confident that greater strides will be made in moving this population, or any population for that matter, along the HBM continuum to behavioral change.

Summary

The present study had two main goals. The first goal was developed to analyze how previous educational efforts about HIV/AIDS had impacted a population of people in Sonsonate, El Salvador in the context of the Health Belief Model (HBM) of behavior change. The second goal was to produce Geographical Information Systems (GIS) maps so that this population could be analyzed on more of an individual, rather than population-sized scale.

The study was successful on both attempts. It was able to establish a sense of what the population's knowledge level was along with establishing a basis of this population's perceived severity/perceived susceptibility as well as its rate of safe behavioral practices. Despite multiple efforts by the government of El Salvador as well as several Non-governmental Organizations (NGOs) operating in the country the general population across these six municipalities or town remained inadequate considering the seriousness of the health threat of HIV/AIDS (*The Fight Against AIDS in El Salvador, A Commitment of a Nation*, 2006). Even though a population of people were found to already be at the end of the continuum, ie engaging consistently in safe behaviors a large sample of the participants had issues with either the knowledge or perception of HIV/AIDS. Multiple, major errors in knowledge of prevention and transmission were identified. Also multiple unhealthy or confusing perceptions of either severity or susceptibility were also pinpointed.

By applying the HBM to this study, the researcher created a simple and clear "roadmap" to follow to track this population. The foundation, according to the HBM is a proper knowledge, without that the other steps are obtainable but chance and confusion

factor into explaining why a person reaches those levels. This study effectively showed considerable lacks of knowledge within this population. By utilizing the GIS mapping capabilities, the researcher was able to map the population of people that had considerable knowledge deficits. This population should be targeted with tailored educational efforts to correct and fill in the gaps in knowledge. Only after this occurs should work begin on ensuring that the level of perceived severity and perceived susceptibility is adequate.

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Appendix A. Internal Review Board (IRB) Approval

VCOM Institutional Review Board
Notice of Review

August 28, 2007

Sarah Cates DO
PhD Candidate
Virginia Polytechnic Institute

RE: IRB#2007/030, The Health Belief Model and the Effects of National HIV/AIDS Education Among 15-39 Year Olds, Health Care workers and National Epidemiological Data In Sonsonate,
El Salvador

Dear Dr. Cates:

Your protocol has been reviewed via expedited procedure by two members of the VCOM IRB. Reviewer concerns and questions were addressed to you via email. Your responses and revised protocol have been reviewed and accepted by the reviewers and your project has been **approved**.

Federal guidelines dictate that IRB-approved research must be reviewed no less than once a year. Note that your continuation review will be August 28, 2008. Approximately 30 days before this date, you will receive a Progress Report Form from the IRB Coordinator. Please fill out this report and submit it to the IRB Coordinator at least two weeks prior to your review date.

Please remember that as the PI, you are responsible for promptly reporting to the IRB any proposed changes in the research activity prior to being implemented. You are also responsible for promptly reporting any injuries or adverse events or unanticipated risks to subjects.

Thank you for your cooperation. If you have any questions or concerns, please do not hesitate to contact the IRB Coordinator (eperry@vcom.vt.edu, 231-8240).

Sincerely,

Hara P. Misra, DVM, PhD
Chairman, VCOM Institutional Review Board

Appendix B. Human Subjects Testing Course Certificate

Completion Certificate

This is to certify that

Sarah Cates
has completed the Human Participants Protection Education for Research Teams online course, sponsored by the National Institutes of Health (NIH), on 06/07/2007.

This course included the following:

* key historical events and current issues that impact guidelines and legislation on human participant protection in research.
* ethical principles and guidelines that should assist in resolving the ethical issues inherent in the conduct of research with human participants.
* the use of key ethical principles and federal regulations to protect human participants at various stages in the research process.
* a description of guidelines for the protection of special populations in research.
* a definition of informed consent and components necessary for a valid consent.
* a description of the role of the IRB in the research process.
* the roles, responsibilities, and interactions of federal agencies, institutions, and researchers in conducting research with human participants.

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Appendix C. Human Subjects Informed Consent Form, English

Informed Consent Outline

VIRGINIA COLLEGE OF OSTEOPATHIC MEDICINE

Informed Consent Form for Participants in Research Projects Involving Human Subjects

The Health Belief Model and the Effects of National HIV/AIDS Education Efforts Among 15-39 Year Olds, Health Care workers and National Epidemiological Data In Sonsonate, El Salvador

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miglesias@vcom.vt.edu

24-Hour Emergency Telephone Number
This study will not require a 24 hour emergency contact number as it presents minimal risk t to participants

I. Investigators' Statement

We are asking you to be in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether to be in the study or not. Please read the form carefully. You may ask questions about the purpose of the research, the possible risks and benefits, and anything else about the research or this form that is not clear. When we have answered all your questions, you can decide if you want to be in the study or not. This process is called "informed consent." We will give you a copy of this form for your records.

II. Purpose of this Research/Project

The purpose of this study will be to determine current general HIV/AIDS knowledge and also to understand the level of individual beliefs about risks of contracting HIV/AIDS within this community
This study will examine the ways in which participants learn and what impact past and current educational programs have had on HIV/AIDS knowledge and prevention behaviors.

A goal of 500 participants will be interviewed from the general population of Sonsonate, El Salvador between the ages of 15-39. Also interviews will be conducted with health care workers serving this area.

The results will be used in future education programs about HIV/AIDS in this community

III. Procedures

You will be asked to participate in a single interview. The interview should last no more than one hour. The interview will be conducted in your home or at another location recommended by the participant. The interview will be conducted in private.

Some of the interview questions will ask about past and current sexual practices. Others will ask about your understanding of HIV/AIDS. Questions of a sensitive nature include: How many sexual partners have you had in the past year? and Did you use a condom the last time you had sex?

IV. Risks, Stress or Discomfort

This study has minimal risk.

However, since some the questions are sensitive in nature, feelings of embarrassment or other discomfort is possible.

If at any time you do not feel comfortable answering any of the questions, you may refuse to answer without penalty or removal from the study.

V. Alternatives to Taking Part in this Study

This is not applicable as no alternatives exist to taking part in this study.
This study is an analysis of a population at a point in time, post program.

VI. Benefits of the Study

There are no benefits to the participant for taking part in this study. However, the data collected through this study may help to bring better, more targeted prevention programs back to this community in the future.

No guarantee or promise of any benefit has been made as an encouragement for your participation.

VII. Extent of Anonymity and Confidentiality

All identifying information will be removed from the study material at the completion of the interviews. Only demographic data will remain, age, gender, religion, education level, etc.
Your identity in this study will be treated as confidential. The results of the study may be published and shared with the Ministry of Health but no identifying information will be made available. Any records or data obtained through your participation in this study may be inspected by the Virginia College of Osteopathic Medicine's institutional review board.

VIII. Compensation

No compensation will be given for participation in this study.

The investigators will also not be compensated for conducting this study.

IX. Freedom to Withdraw

You are free to choose whether or not to participate in this study. There will be no penalty if you choose not to participate. If at any time you feel like you wish not to answer a question, please say so and that question will be skipped and the interview will continue. You are free to stop the interview at any time without penalty.

X. Subject's Responsibilities

I voluntarily agree to participate in this study. I have the following responsibilities:

-complete a single interview honestly and openly

XI. Subject's Statement

I have read and understand this consent form, and I volunteer to participate in this research study. I have had all of my questions answered. I understand that I will receive a copy of this form. I hereby acknowledge the above and give my voluntary consent. I understand that my consent does not take away any legal rights. I further understand that nothing in this consent form is intended to replace any applicable Federal, state, or local laws.

Printed name of participant	Signature of participant	Date

When participant in a minor:

Printed name of parent	Signature of parent	Date

When subject is not able to provide consent:

Printed name of representative	Signature of representative Date

Relationship of representative to participant

Should I have any pertinent questions about this research or its conduct, research subjects' rights, and whom to contact in the event of a research-related injury to the subject, I may contact:

Sarah Cates
540.998.3403
scates@vcom.vt.edu

Mauro Iglesias, MD
miglesias@vcom.vt.edu

Appendix C. Informed Consent Form, Spanish

Esquema de Consentimiento Informado
VCOM

Impreso de Consentimiento Informado para Participantes en un Proyecto de Investigación que Envuelva Sujetos Humanos

El Modelo de Creencia del Salud (Health Benefit Model) y los Efectos de las Actividades de la Educación Nacional con Respeto a la SIDA (HIV/AIDS) Entre los que Tienen 15 a 39 años de Edad, los que Trabajan Profesionalmente en la Industria de la Salud y Datos Nacionales Epidemiológicos en Sonsonante, El Salvador

Investigador(es)
Sarah Cates: Estudiante de VCOM/Virginia Tech
Teléfono: 540-998-3403 Email: scates@vcom.vt.edu
Mauro Iglesias, MD.: Facultad de VCOM en El Salvador
Teléfono: 2264- 3162 Email: miglesias@vcom.vt.edu

Numero de Teléfono de Emergencia, 24 horas al Día
Esta investigación no requiere un contacto 24 horas al día por caso de riesgos mínimos a los participantes.

I. Declaración de la Investigadora

Estamos pidiendo su participación en una investigación estudio. El propósito de este impreso de consentimiento es darse la información que usted necesitara para ayudarle en decidir si o no participarle en el estudio. Por favor, lea esta impreso completamente y con cuidado. Pida todas las preguntas que tenga del propósito de la investigación, o los riesgos posibles, los beneficios o cualquier otra cosa de esta impreso o la investigación en que no entienda. Después de que se respondamos a todas sus preguntas, pueda decidir si todavía se quiera participar en esta investigación o no. Este proceso se llama 'consentimiento informado'. Se daremos una copia de este impreso para su archivo.

II. Propósito de esta Investigación/Proyecto

El propósito de esta investigación es determinar conocimiento general y corriente de la SIDA (HIV/AIDS) de la gente que viven en esta comunidad. Este estudio examinara las maneras en que los participantes aprendan y el impacto corrientes y del pasado de los programas educacionales han tenido en su conocimiento y confortación impeditivo de la SIDA (HIV/AIDS).

La meta de 500 (quinientos) ser entrevistado de la población ciudadana de Sonsonete, El Salvador. Todas participantes serán entre las 15 – 39 anos de edad. Entrevistarse con las que trabajan profesionalmente en la industria de Salud que sirven en esta región. Los resultados darán fundación a programas educacionales de SIDA (HIV/AIDS) en el futuro en esta comunidad.

III. Procedimientos

Se pida su participación en una sola entrevista. Esta entrevista debe durar no más que una hora. La entrevista puede ser situada en su casa o otra sitio que se prefiere el/la participante. La entrevista debe situarse en un sitio lo mas privada posible.

Algunas de las preguntas pedirán de corriente y del pasado prácticas sexuales. Otras preguntas pedirán su conocimiento de la SIDA (HIV/AIDS). Ejemplos de preguntas que son sensitivos son: ¿Cuantos compañeros(as) sexuales ha tenido en este ano pasado? O ¿Ha usado un condón el último vez que ha hecho el amor?

IV. Riesgos, Tensión o Incomodidad

Esta investigación da riesgo mínimo. Sin embargo, por caso de algunas preguntas que son sensitivos, sentimientos de turbación será posible.

Si en algún momento no se sienta cómodo en responder a alguna pregunta, deba negarse responder sin castigo y sin echarse del estudio.

V. Las Alternativos de Tomar Parte en este Estudio

Alternativos no existen para este estudio. Este estudio es un análisis de la creencia de la población en un punto en tiempo.

VI. Los Beneficios del Estudio

No hay beneficios a los participantes que dan respuestas voluntariamente. Sin embargo, los datos coleccionado y analizado deben ayudar crear mejor programas educacionales profilácticos para esta comunidad.

Ningún garantía o promesa de algún beneficio ha sido hecho come aliento de su participación.

VII. Grado del Anonimato y del Secreto

Toda la información que se identifican a los participantes será tirada de los materiales del estudio al final de los entrevistas. Solo quedaran datos demográficos, como edad, genero, religión, nivel de educación, etc. Su identidad en este estudio será guardado con confianza y del secreto. Los resultados de este estudio deben ser publicados y repartidos con el Ministerio de Salud pero no serán incluidas ninguna información que se identifican personalmente los participantes. Todas las respuestas y los datos que nos obtienen por su participación deben ser inspeccionada por el 'Institutional Review Board (IRB)' de VCOM.

VIII. Compensación

No se da compensación para participación en este estudio.
Los investigadores(as) tampoco de recibirán compensación para su trabajo en este estudio.

IX. El Derecho de Retirarse

Esta usted libre a escoger si quiera participar o no en este estudio. No hay castigo si no elige participar. A toda hora, si no quiera responder a una pregunta pro cualquier razón, simplemente dígase así y seguimos con la próxima pregunta. Esta libre a parar la entrevista en algún momento sin castigo.

X. Las Responsabilidades del Participante

El participante en este estudio participa voluntariamente. El participante es responsable a completar una sola entrevista francamente y con honradez.

XI. Declaración del Participante

“Yo he leído y entiendo este impreso de consentimientos y yo quiero participar voluntariamente en este investigación estudio. Todas mis preguntas han sido respondidas. Entiendo que recibirá una copia de este impreso. Yo entiendo lo que ha dicho aquí arriba y da mi consentimiento voluntariamente. Entiendo que este consentimiento no saca ninguno derecho legal. Además, entiendo que nada de este consentimiento tiene la intención de reponer algunas leyes federales, estatales, o locales.”

_____	_____	_____
Nombre del Participante	Firma del Participante	Fecha

Si el/la Participante tiene menos que 18 años de edad:

_____	_____	_____
Nombre del Padre	Firma del Padre	Fecha

Si el/la Participante no esta presente par dar consentimiento:

_____	_____	_____
Nombre del Representante	Firma del Representante	Fecha

_____
Relación del Representante al Participante

Si tengo preguntas sobre esta investigación, el proceso, derechos para participantes o quien debo contactar por caso de algún daño que haya resultado de mi participación en esta investigación:

Sarah Cates - Teléfono: 540-998-3403 USA scates@vcom.vt.edu
Mauro Iglesias, MD miglesias@vcom.vt.edu

Appendix D. Questionnaire Instrument, English (codes used in analysis)

Instrument:
Demographic information

1. Can you read? 1Yes 2no (read)
2. Gender: 1M 2F (gender)
3. Age: (age)
4. Marital status: 1Married 2 Single 3Divorced 4Other (married)
5. Religion: 1Catholic 2Protestant 3Other (religion)
6. Education: 1primary 2secondary 3university 4never went to school (ed)
7. Do you own a TV? 1Yes 2no (tv)
8. Do you own a Radio? 1Yes 2no (radio)
9. How often do you watch TV: 1daily 22-3 days per week 34-5 times a month 4Rarely 5I do not watch TV (watchtv)
10. How long do you watch? 130 minutes or less 230 minutes to 1 hour 31-2 hours 43-4 hours 5more than 4 hours (watch tv2)
11. How often do you listen to the radio? 12-3 days per week 24-5 days per week 3every day 4Rarely 5I do not listen to the radio (lstnrad)
12. How long do you listen? 130 minutes or less 230 minutes to 1 hour 31-2 hours 43-4 hours 5more than 4 hours (lstnrad2)

AIDS knowledge test – (true/false)

13. Most scientists today believe that AIDS is caused by a virus called HIV (Human Immunodeficiency Virus) 1T 2F (virus)
14. Most people who develop AIDS eventually recover 1T 2F (cure)
15. HIV is carried in the blood 1T 2F (trnsmsn)
16. HIV testing is free 1T 2F (testing)
17. AIDS weakens the body's ability to fight off disease 1T 2F (illness)
18. HIV can get into your body if you share a needle with a drug Kuser who has the infection 1T 2F (ivdu)
19. People usually become very sick with AIDS a few days after being infected with HIV. 1T 2F (illness2)
20. People have been known to get HIV and develop AIDS from insect bites 1T 2F (insects)
21. It is safer not to have sexual intercourse at all than to have sexual intercourse using a condom. 1T 2F (abstnce)
22. A vaccine has recently been developed that prevents people from getting HIV infection. 1T 2F (vacc)
23. You can get HIV through an open cut or wound. 1T 2F (trnsmsn2)
24. A woman can infect her baby with AIDS during pregnancy 1T 2F (trnsmsn3)
25. You can get AIDS from shaking hands or hugging a person with AIDS 1T 2F (trnsmsn4)

26. You can get AIDS from sharing forks or glasses with a person who has AIDS 1T 2F (trnsmsn5)
27. You can get AIDS from kissing 1T 2F (trnsmsn6)
28. You can get AIDS for oral sex 1T 2F (trnsmsn7)
29. A vaccine is available to prevent AIDS 1T 2F (vacc2)
30. AIDS is caused by a virus 1T 2F (virus2)
31. AIDS is a condition you are born with 1T 2F (congentl)
32. What you eat can give you AIDS 1T 2F (trnsmsn8)
33. AIDS can be cured 1T 2F (cure2)
34. Using a condom during sex can lower the risk of getting AIDS 1T 2F (trnsmsn9)
35. You can get AIDS by sharing a needle with a drug user who has the disease 1T 2F (ivdu2)
36. People with AIDS usually have lots of other disease as a result of AIDS 1T 2F (illness3)
37. The cause of AIDS is unknown 1T 2F (cause)
38. Having sex with someone who has AIDS is one way of getting it 1T 2F (trnsmsn0)

Perceived severity of HIV/AIDS and risk assessment: (yes/no or multiple choice)

39. HIV/AIDS 1a serious problem, 2somewhat of a problem, 3not a problem in your community. (problem)
40. People in my neighborhood are likely to be infected with AIDS 1yes 2no (neighbor)
41. AIDS is a health threat that I take very seriously 1yes 2no (threat)
42. There is a good chance I will get AIDS within the next 5 years 1yes 2no (chance)
43. AIDS is the scariest disease I know 1yes 2no (scary)
44. I know someone infected with HIV 1yes 2no (know)
45. The number of people with AIDS is increasing 1yes 2no (prev)

Perceived susceptibility of HIV/AIDS: (yes/no)

46. I am afraid of getting AIDS 1yes 2no (afraid)
47. I am less likely than most people to get AIDS 1yes 2no (chance2)
48. I know how to protect myself from AIDS 1yes 2no (protect)
49. Someone I know is likely to get AIDS 1yes 2no (chance3)
50. What risk do you think there is of you getting AIDS? 1Small 2medium 3high (risk)
51. In comparison to other people of your age and sex, what risk do you think there is of you getting AIDS? 1Little 2middle 3high (risk2)
52. I have or have had in the past, sex with prostitutes 1yes 2no (prost)
53. I have sex with various people 1yes 2no (partner3)
54. I have a high chance of getting AIDS because of my past history 1yes 2no (chance4)
55. I know how to have safe sex 1yes 2no (safe)

Behavioral Practices (yes/no)

56. I use a condom, have sex with only one person, or abstain from sexual activity because of the threat of AIDS. 1yes 2no (condom)
57. In the last six months, I have Had sex with a prostitute 1yes 2no (prost2)
58. Had oral sex 1yes 2no (oral)
59. Had vaginal intercourse without a condom 1yes 2no (nocondom)
60. Had anal sex 1yes 2no (anal)
61. There is still time to protect myself against AIDS 1yes 2no (protect1)
62. I am very careful about who I have sex with 1yes 2no (careful)
63. I have had an HIV test 1yes 2no (test)
64. I only have sex with one person, my husband/wife 1yes 2no (monogamy)
65. I have injected drugs in the past 1yes 2no (ivdu1)
66. How many sexual partners have you had in the last 3 months? 10-1 21-3 33-5 4more than 5 (partner)
67. In the last year? 10-1 21-3 33-5 4more than 5 (partner2)
68. How old were you the first time you had sex? 112 or younger 213-17 318-22 423-27 5Have not had sex (age)
69. How often do you drink alcohol? 1Daily 21-2 times a week (etoh) 32-3 times a month 4rarely 5I don't drink alcohol

Questions for health care providers: (yes/no)
Include the general AIDS knowledge questions

70. I counsel my patients on HIV/AIDS 1yes 2no
71. I offer my patients HIV testing 1yes 2no
72. I have HIV/AIDS patients1yes 2no
73. I have HIV/AIDS education materials available in my clinic 1yes 2no
74. HIV is a major health problem in this community: 1strongly agree 2agree 3neither agree or disagree 4disagree 5strongly disagree
75. The number of HIV positive people will increase in this community over the next 5 years: 1strongly agree 2agree 3neither agree or disagree 4disagree 5strongly disagree
76. Injection drug use is a problem in this community: 1strongly agree 2agree 3neither agree or disagree 4disagree 5strongly disagree
77. Prostitution is a problem in this community: 1strongly agree 2agree 3neither agree or disagree 4disagree 5strongly disagree
78. My patients know how HIV is transmitted and prevented: 1strongly agree 2agree 3neither agree or disagree 4disagree 5strongly disagree

Appendix D. Questionnaire Instrument, Spanish

Questionnaire for project in Sonsonate, El Salvador about HIV/AIDS prevention Sarah Cates, DO, PhD Candidate

Información demográfica

¿Puede usted leer? Si No

Sexo: M F

Edad:

Estado Civil
Casado Acompañado Soltero Divorciado Viudo

Religión:
Católica Protestante Otro

Educación:
Primaria Secundaria Técnico Universidad Nunca fue a la escuela

¿Ocupación?

¿Tiene una televisión? Sí No

¿Tiene un radio? Sí No

¿Con que frecuencia mira la televisión?
- Cada día
- 2 o 3 días por semana
- 4 o 5 veces por mes
- raramente
- Yo no miro televisión

¿Cuanto tiempo mira televisión al día?
- Menos de 30 minutos
- 30 minutos a 1 hora
- 1 hora a 2 horas
- 3 a 4 horas
- Más de 4 horas

¿Con qué frecuencia escucha usted la radio?

2 a 3 días por semana
4 a 5 veces por semana
Todos los días
Raramente
Yo no escucho a la radio

¿Cuánto tiempo al día escucha radio?

Menos de 30 minutos
30 minutos a 1 hora
1 hora a 2 horas
3 a 4 horas
Más de 4 horas

Prueba de conocimiento de SIDA

1. ¿La mayor parte de científicos hoy creen que el SIDA es causado por un virus llamado Virus de Inmunodeficiencia Humano (VIH)?

VERDADERO FALSO

2. ¿La mayor parte de personas que desarrollan el SIDA finalmente se recuperan?

VERDADERO FALSO

3. ¿El VIH es llevado en la sangre?

VERDADERO FALSO

4. ¿Las pruebas de VIH son gratis?

VERDADERO FALSO

5. ¿El SIDA debilita la capacidad del cuerpo de rechazar la enfermedad?

VERDADERO FALSO

6. ¿El VIH puede entrar en su cuerpo si usted comparte una aguja o jeringa con una persona que usa drogas y que esta infectado?

VERDADERO FALSO

7. ¿La gente por lo general se enferma con SIDA unos días después de haber sido infectado por el VIH?

VERDADERO FALSO

8. Se ha conocido que la gente se infecta VIH y desarrolla SIDA por picaduras de insecto

VERDADERO FALSO

9. Es mas seguro no tener relaciones sexuales en absoluto que tener relaciones sexuales usando un condón.

VERDADERO FALSO

10. Una vacuna ha sido desarrollada recientemente lo que impide a la gente se infecte de VIH.

VERDADERO FALSO

11. Usted puede adquirir VIH por una cortada o herida.

VERDADERO FALSO

12. Una mujer puede infectar a su bebé de SIDA durante el embarazo

VERDADERO FALSO

13. Usted puede adquirir SIDA de estrechar la mano o abrazar a una persona con el SIDA

VERDADERO FALSO

14. Usted puede adquirir SIDA de compartir tenedores o gafas con una persona que tiene el SIDA

VERDADERO FALSO

15. Usted puede adquirir SIDA de besos

VERDADERO FALSO

16. Usted puede adquirir SIDA practicando sexo oral

VERDADERO FALSO

17. Una vacuna está disponible para prevenir el SIDA

VERDADERO FALSO

18. El SIDA es causado por un virus

VERDADERO FALSO

19. El SIDA es una condición con la que usted nace

VERDADERO FALSO

20. Lo que usted come puede darle el SIDA

VERDADERO FALSO

21. El SIDA puede ser curado

VERDADERO FALSO

22. La utilización de un condón durante el sexo puede bajar el riesgo de conseguir el SIDA

VERDADERO FALSO

23. Usted puede conseguir el SIDA por compartir una aguja con un usuario de medicina que tiene la enfermedad

VERDADERO FALSO

24. La gente con el SIDA por lo general tiene la mayor parte de otra enfermedad a consecuencia del SIDA

VERDADERO FALSO

25. La causa de SIDA es desconocida

VERDADERO FALSO

26. Tener el sexo con alguien que tiene el SIDA es un modo de conseguirlo.

VERDADERO FALSO

Severidad percibida de VIH/SIDA y evaluación de riesgo:

1. En su comunidad, el VIH/SIDA es un problema:

Serio en su comunidad
Mas o menos serio en su comunidad
No es un problema en su comunidad

2. Gente en mi comunidad o vecindario podrían estar infectados por el SIDA

Si No

3. El SIDA es una amenaza de salud que tomo muy seriamente

Si No

4. Hay una buena posibilidad de adquirir el SIDA dentro de los próximos 5 años

Si No

5. El SIDA es la enfermedad más atemorizante que conozco

Si No

6. Sólo tengo el sexo con una persona, mi marido/esposa o pareja

Si No

7. Me inyecto drogas o lo he hecho en el pasado

Si No

8. Conozco de alguien infectado por el VIH
Si No

9. ¿Cuántos, as compañeros, as sexuales ha tenido en los últimos 3 meses?
0 - 1
1 - 3
3 - 5
Más de 5

10. ¿En el año pasado?
0 - 1
1 - 3
3 - 5
Más de 5

11. ¿Qué edad usted tuvo sexo por primera vez?
12 o menor
13 - 17
18 - 22
23 - 27
No ha tenido el sexo

12. ¿Con qué frecuencia bebe usted el alcohol?
Todos los días
1 - 2 veces por semana
2 - 3 veces por mes
Raramente
No bebo alcohol

Susceptibilidad percibida de VIH/SIDA:

1. Tengo miedo de adquirir el SIDA
Si No

2. Yo tengo menos probabilidades de adquirir el SIDA que la mayor parte de personas.
Si No

3. Sé protegerme del SIDA
Si No

4. Alguien que conozco tiene probabilidades de adquirir el SIDA
Si No

5. El número de gente con el SIDA aumenta
Si No

6. ¿Qué riesgo piensa que hay de que usted adquiera el SIDA?
Bajo Más o menos Alto

7. ¿En comparación con otra gente de su edad y sexo, qué riesgo piensa que hay de que usted adquiera el SIDA?
   Bajo Más o menos Alto

8. Tengo o he tenido en el pasado, sexo con trabajadoras del sexo
   Si No

9. Tengo sexo con múltiple o varias personas
   Si No

10. Tengo alta posibilidad de adquirir el SIDA debido a mi historia pasada.
   Si No

Intención de cambiar comportamiento:

1. Estoy usando condón, tengo sexo con una sola pareja o absteniéndome (no tengo relaciones sexuales) por la amenaza del SIDA
   Si No

3. En los ultimos 6 meses, he tenido

Sexo con trabajadores del sexo	Si	No
Sexo oral	Si	No
Sexo vaginal sin condón	Si	No
Sexo anal	Si	No

4. Sé como tener sexo seguro
   Si No

5. Todavía es tiempo para protegerme contra el SIDA
   Si No

6. Tengo mucho cuidado sobre con quién tengo sexo
   Si No

7. Me he hecho o realizado una prueba de VIH
   Si No

Preguntas para abastecedores de asistencia médica:

Señales a acción:
1. Aconsejo a mis pacientes en el VIH/SIDA
   Si No a veces

2. Ofrezco mis pruebas de VIH de pacientes
   Si No a veces

3. Tengo a pacientes con VIH/SIDA

Si No

4. Tengo materiales de educación sobre VIH/SIDA disponibles en mi clínica o sede
Si No a veces

5. El VIH es un problema de salud principal en esta comunidad:
Completamente de acuerdo De acuerdo
No de acuerdo ni en desacuerdo Desacuerdo Completamente desacuerdo

6. El número de gente VIH positiva aumentará en esta comunidad durante los próximos 5 años:
Completamente de acuerdo De acuerdo
No de acuerdo ni en desacuerdo Desacuerdo Completamente desacuerdo

7. El consumo de drogas inyectadas es un problema en esta comunidad
Completamente de acuerdo De acuerdo
No de acuerdo ni en desacuerdo Desacuerdo Completamente desacuerdo

8. La prostitución es un problema en esta comunidad
Completamente de acuerdo De acuerdo
No de acuerdo ni en desacuerdo Desacuerdo Completamente desacuerdo

9. Mis pacientes saben como el VIH es transmitido y prevenido
Completamente de acuerdo De acuerdo
No de acuerdo ni en desacuerdo Desacuerdo Completamente desacuerdo

Appendix E: Raw Data Sample

SURVEYNO	read	gender	age	married	religion	ed	tv	radio
AJ0001	1	1	25	1	2	2	2	2
AJ0002	2	2	30	2	1	4	1	1
AJ0003	1	1	16	2	3	2	1	1
AJ0005	1	2	25	1	1	2	1	1
AJ0006	1	2	30	2	2	1	2	2
AJ0007	1	2	21	1	1	1	1	1
AJ0008	1	1	33	2	1	2	1	1
AJ0009	1	2	20	2	1	2	1	1
AJ0009	1	2	18	1	3	1	2	2
AJ0010	1	1	23	1	3	1	1	1
AJ0011	1	2	29	1	3	2	1	1
AJ0012	2	2	29	1	2	4	2	1
AJ0013	2	2	25	2	2	4	1	1
AJ0014	1	1	38	1	1	1	2	1
AJ0015	2	2	34	1	1	4	1	2
AJ0016	1	2	15	2	3	2	1	2
AJ0017	1	2	30	1	1	4	1	1
AJ0018	1	2	33	1	1	2	1	1
AJ0019	1	1	29	1	2	1	1	1
AJ0020	2	1	39	1	1	1	1	1
AJ0021	1	2	22	1	1	1	1	1
AJ0022	1	2	17	1	1	1	2	1
AJ0024	1	2	22	1	1	2	1	1
AJ0025	1	2	15	1	2	1	1	1
AJ0026	1	2	28	2	1	2	1	1
AJ0027	1	2	30	1	3	1	1	1
AJ0028	1	1	29	1	3	2	1	1
AJ0029	1	2	26	1	1	1	2	1
AJ0030	1	2	22	1	2	2	1	1
AJ0031	1	2	27	2	1	4	1	1
AJ0032	1	2	15	1	3	2	1	1
AJ0033	1	2	25	1	1	2	1	1
AJ0034	1	2	15	2	2	2	1	1
AJ0035	1	2	36	1	1	1	1	1
AJ0036	1	1	26	2	3	2	1	1
AJ0037	1	2	33	1	3	1	1	1
AJ0038	1	2	35	2	3	1	1	2
AJ0039	1	2	24	2	1	1	1	1
AJ0040	1	1	21	1	2	1	2	1
Aj0041	1	2	26	2	3	1	1	1
AJ0042	1	1	17	2	3	2	1	1
AJ0043	1	2	19	1	1	2	1	1
AJ0044	1	2	19	1	1	1	1	1
AJ0045	1	2	19	1	3	1	1	1
AJ0046	1	1	24	1	1	2	1	1
AJ0047	1	2	22	2	3	1	1	1
AJ0048	1	1	22	2	1	2	1	1
AJ0049	1	1	35	2	1	2	1	1
AJ0050	1	2	21	1	1	1	2	1
AJ0051	2	2	37	1	3	4	1	1

AJ0052	1	2	28	1	2	2	1	1
AJ0053	1	2	19	1	3	2	1	1
AJ0054	2	2	26	1	2	4	1	1
AJ0055	1	2	27	1	3	1	1	1
AJ0056	1	2	30	1	1	2	1	1
AJ0057	1	1	31	1	1	2	2	1
AJ0058	1	2	19	1	1	1	1	1
AJ0059	1	2	30	2	2	2	1	1
AJ0060	1	2	25	1	1	2	1	1
AJ0064	1	1	20	1	2	3	1	1
AJ0065	1	2	31	1	2	1	1	1
AJ0066	1	2	19	1	3	2	1	1
AJ0067	1	2	29	1	2	1	1	1
AJ0068	1	2	26	1	1	1	1	1
AJ0069	1	1	22	1	3	1	1	1
AJ0070	1	2	20	1	2	2	1	1
AJ0071	1	2	30	1	2	2	1	1
AJ0072	1	1	27	1	1	1	1	1
AJ0073	1	2	22	1	2	1	1	2
AJ0074	1	1	39	1	2	2	1	1
AJ0075	1	2	19	1	1	2	1	1
AJ0076	1	1	26	2	3	1	1	1
AJ0077	1	2	28	2	3	1	1	1
AJ0078	1	2	21	1	1	1	1	1
AJ0079	1	2	24	1	1	2	1	1
AJ0080	1	2	33	1	2	1	1	1
AJ0081	1	2	32	1	2	1	1	2
AJ0082	1	2	35	1	2	1	1	1
AJ0083	1	2	39	1	2	2	1	1
AJ0084	0	2	22	1	1	2	1	1
AJ0085	1	2	30	1	2	1	1	1
AJ0086	1	2	19	2	1	2	1	1
AJ0087	1	2	29	2	2	1	1	1
AJ0088	1	2	22	2	3	1	2	1
AJ0089	2	2	39	1	1	4	1	2
AJ0090	1	2	16	1	3	2	1	1
AJ0091	1	2	39	1	1	1	1	1
AJ0092	1	2	30	1	1	1	1	1
AJ0093	1	2	30	1	1	2	1	1
AJ0094	1	2	19	1	2	1	1	1
AJ0095	1	2	19	1	1	2	1	1
AJ0096	1	2	16	1	1	1	2	1
AJ0097	1	2	19	2	1	1	1	1
AJ0098	1	0	27	1	1	1	1	1
AJ0099	1	2	37	4	1	4	1	1
AJ0100	1	2	26	1	2	1	1	1
AJ0101	1	2	19	1	1	1	1	1
AJ0102	1	2	20	2	1	2	1	1
AJ0103	1	2	28	1	2	1	1	1
AJ0104	1	2	22	1	1	1	1	1
AJ0105	1	2	19	2	1	2	1	1
AJ0106	1	2	34	2	1	1	1	1
AJ0107	1	2	33	1	2	1	1	1
AJ0108	1	2	23	1	2	1	1	1

AJ0109	2	2	38	1	1	4	1	1
AJ0110	1	2	15	2	1	1	1	1
AJ0111	2	2	38	1	3	4	2	1
AJ0112	1	2	21	1	2	2	1	1
AJ0113	1	2	16	2	3	2	1	1
AJ0114	1	2	20	2	3	1	1	1
AJ0115	2	2	35	1	1	4	1	1
AJ0116	1	2	16	2	3	2	1	1
AJ0117	1	2	34	1	2	1	1	1
AJ0118	1	1	2	1	2	2	1	2
AJ0119	1	1	33	1	2	2	1	1
AJ0120	1	2	16	1	1	2	1	1
AJ0121	1	2	30	1	2	2	1	1
AJ0122	1	2	27	1	2	2	1	1
AJ0123	1	2	29	2	1	2	1	1
AJ0124	1	1	24	1	3	2	1	1
AJ0125	1	2	23	1	2	2	1	1
AJ0126	1	2	15	2	1	2	1	1
AJ0127	1	2	17	1	3	2	1	1
AJ0128	1	1	31	1	1	1	1	1
AJ0129	1	2	17	1	1	1	1	1
AJ0130	1	2	30	1	2	2	1	1
AJ0131	1	2	16	2	2	2	1	1
AJ0132	1	2	30	1	2	4	1	2
AJ0133	2	2	35	1	2	4	2	1
AJ0134	2	2	39	1	1	4	1	1
AJ0136	1	2	21	2	1	3	1	1
AJ0138	1	2	26	2	2	3	1	1
AJ0139	1	1	22	1	1	2	1	1
AJ0140	1	2	27	1	1	1	1	2
AJ0141	1	2	17	2	3	2	1	1
AJ0142	1	2	23	2	1	2	1	1
AJ0143	1	2	17	2	1	2	1	1
AJ0144	1	1	35	1	2	2	1	1
AJ0145	1	2	15	1	3	1	1	1
AJ0146	1	2	26	2	1	2	1	1
AJ0147	1	2	24	1	1	2	1	1
AJ0148	1	1	34	1	3	2	1	1
AJ0149	1	2	27	1	3	1	1	1
AJ0150	1	1	21	2	1	2	1	1
AJ0151	1	2	35	1	0	0	1	1
AJ0152	2	2	27	2	3	4	1	1
AJ0153	1	2	21	2	1	2	1	1
AJ0154	1	2	36	1	2	1	2	1
AJ0155	1	2	22	2	1	2	1	1
AJ0156	1	1	38	2	2	4	1	1
AJ0157	1	2	27	1	2	1	1	1
AJ0158	2	2	23	2	1	2	1	1
AJ0159	1	2	25	1	2	1	1	2
AJ0160	1	1	29	1	1	2	1	1
AJ0161	1	2	29	1	2	1	1	1
AJ0162	1	2	21	2	2	3	1	1
AJ0163	1	2	26	1	1	2	1	1
AJ0164	1	2	28	2	1	2	1	1

Appendix F: Descriptive Statistical Analysis

```
-------------------------------------------------------------------------------
-------------------------------------------------------
/* This file contains the descriptive statistics and the frequencies
for the variable
of the dataset. All variables have been recoded. I include also the
variables that I do NOT use
in the analysis. The variables are grouped by category.The order is
as follows: knowledge variables (appendix1),
Behavior (appendix2), Sus and Sev (appendix3), demographics and
exposure (appendix4). */

. *** Appendix1 : Knowledge variables
. * Mean and standard deviation
. tabstat $k, columns(statistics) statistics(mean sd)

    variable |      mean        sd
-------------+--------------------
       virus |  .7706294  .4205751
        cure |  .8130646  .3899952
     trnsmsn |  .9051604  .2930955
     testing |  .7377622  .4400051
     illness |    .83345  .3727041
        ivdu |  .9410132  .2356818
    illness2 |  .4213483  .4939486
     insects |  .7154812  .4513424
     abstnce |  .7239437  .4472025
        vacc |  .6622097  .4731232
    trnsmsn2 |  .5976207  .4905493
    trnsmsn3 |  .8672689  .3394018
    trnsmsn4 |   .930459  .2544604
    trnsmsn5 |  .8163548  .3873288
    trnsmsn6 |  .7141864  .4519582
    trnsmsn7 |  .7034194  .4569094
       vacc2 |   .706993  .4553008
      virus2 |  .8851775  .3189187
    congentl |  .8495822   .357605
    trnsmsn8 |  .9458333  .2264249
       cure2 |  .7578071  .4285592
    trnsmsn9 |  .7270819  .4456151
       ivdu2 |  .9199164  .2715171
    illness3 |  .8320611  .3739418
       cause |  .6057024  .4888693
    trnsmsn0 |  .9397507  .2380306
----------------------------------

. * Tabulations of recoded variables
. tab1 $k

-> tabulation of virus

       Most |
 scientists |
     today |
    believe |
```

```
  that AIDS |
  is caused |
 by a virus |
 called HIV |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        328       22.94       22.94
          1 |      1,102       77.06      100.00
------------+-----------------------------------
      Total |      1,430      100.00

-> tabulation of cure

Most people |
who develop |
       AIDS |
 eventually |
    recover |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        269       18.69       18.69
          1 |      1,170       81.31      100.00
------------+-----------------------------------
      Total |      1,439      100.00

-> tabulation of trnsmsn

     HIV is |
 carried in |
  the blood |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        136        9.48        9.48
          1 |      1,298       90.52      100.00
------------+-----------------------------------
      Total |      1,434      100.00

-> tabulation of testing

HIV testing |
    is free |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        375       26.22       26.22
          1 |      1,055       73.78      100.00
------------+-----------------------------------
      Total |      1,430      100.00

-> tabulation of illness

       AIDS |
weakens the |
     bodyÆs |
 ability to |
  fight off |
    disease |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        238       16.66       16.66
          1 |      1,191       83.34      100.00
```

```
------------+-----------------------------------
      Total |      1,429      100.00

-> tabulation of ivdu

HIV can get |
  into your |
body if you |
    share a |
needle with |
     a drug |
  Kuser who |
  has the i |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |         85        5.90        5.90
          1 |      1,356       94.10      100.00
------------+-----------------------------------
      Total |      1,441      100.00


-> tabulation of illness2

     People |
    usually |
become very |
  sick with |
 AIDS a few |
 days after |
      being |
   infected |
     with H |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        824       57.87       57.87
          1 |        600       42.13      100.00
------------+-----------------------------------
      Total |      1,424      100.00

-> tabulation of insects

People have |
 been known |
 to get HIV |
and develop |
  AIDS from |
     insect |
      bites |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        408       28.45       28.45
          1 |      1,026       71.55      100.00
------------+-----------------------------------
      Total |      1,434      100.00

-> tabulation of abstnce

It is safer |
```

```
not to have |
     sexual |
intercourse |
at all than |
    to have |
     sexual |
 intercours |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        392       27.61       27.61
          1 |      1,028       72.39      100.00
------------+-----------------------------------
      Total |      1,420      100.00

-> tabulation of vacc

  A vaccine |
        has |
   recently |
       been |
  developed |
       that |
   prevents |
people from |
getting HIV |
       infe |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        480       33.78       33.78
          1 |        941       66.22      100.00
------------+-----------------------------------
      Total |      1,421      100.00

-> tabulation of trnsmsn2

You can get |
HIV through |
an open cut |
  or wound. |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        575       40.24       40.24
          1 |        854       59.76      100.00
------------+-----------------------------------
      Total |      1,429      100.00

-> tabulation of trnsmsn3

A woman can |
 infect her |
  baby with |
AIDS during |
  pregnancy |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        191       13.27       13.27
          1 |      1,248       86.73      100.00
------------+-----------------------------------
      Total |      1,439      100.00
```

```
-> tabulation of trnsmsn4

You can get |
  AIDS from |
    shaking |
   hands or |
  hugging a |
person with |
       AIDS |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        100        6.95        6.95
          1 |      1,338       93.05      100.00
------------+-----------------------------------
      Total |      1,438      100.00

-> tabulation of trnsmsn5

You can get |
  AIDS from |
    sharing |
   forks or |
    glasses |
     with a |
 person who |
   has AIDS |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        265       18.36       18.36
          1 |      1,178       81.64      100.00
------------+-----------------------------------
      Total |      1,443      100.00

-> tabulation of trnsmsn6

You can get |
  AIDS from |
    kissing |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        411       28.58       28.58
          1 |      1,027       71.42      100.00
------------+-----------------------------------
      Total |      1,438      100.00

-> tabulation of trnsmsn7

You can get |
   AIDS for |
   oral sex |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        425       29.66       29.66
          1 |      1,008       70.34      100.00
------------+-----------------------------------
      Total |      1,433      100.00

-> tabulation of vacc2
```

```
  A vaccine |
         is |
  available |
 to prevent |
       AIDS |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        419       29.30       29.30
          1 |      1,011       70.70      100.00
------------+-----------------------------------
      Total |      1,430      100.00

-> tabulation of virus2

    AIDS is |
caused by a |
      virus |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        165       11.48       11.48
          1 |      1,272       88.52      100.00
------------+-----------------------------------
      Total |      1,437      100.00

-> tabulation of congentl

  AIDS is a |
  condition |
    you are |
  born with |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        216       15.04       15.04
          1 |      1,220       84.96      100.00
------------+-----------------------------------
      Total |      1,436      100.00

-> tabulation of trnsmsn8

   What you |
    eat can |
   give you |
       AIDS |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |         78        5.42        5.42
          1 |      1,362       94.58      100.00
------------+-----------------------------------
      Total |      1,440      100.00

-> tabulation of cure2

AIDS can be |
      cured |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        349       24.22       24.22
          1 |      1,092       75.78      100.00
------------+-----------------------------------
```

```
      Total |      1,441      100.00

-> tabulation of trnsmsn9

    Using a |
     condom |
 during sex |
  can lower |
the risk of |
    getting |
       AIDS |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        390       27.29       27.29
          1 |      1,039       72.71      100.00
------------+-----------------------------------
      Total |      1,429      100.00

-> tabulation of ivdu2

You can get |
    AIDS by |
  sharing a |
needle with |
a drug user |
who has the |
    disease |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        115        8.01        8.01
          1 |      1,321       91.99      100.00
------------+-----------------------------------
      Total |      1,436      100.00

-> tabulation of illness3


People with |
       AIDS |
    usually |
  have lots |
   of other |
 disease as |
a result of |
       AIDS |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        242       16.79       16.79
          1 |      1,199       83.21      100.00
------------+-----------------------------------
      Total |      1,441      100.00

-> tabulation of cause

  The cause |
 of AIDS is |
    unknown |      Freq.     Percent        Cum.
------------+-----------------------------------
```

```
          0 |        567       39.43       39.43
          1 |        871       60.57      100.00
------------+-----------------------------------
      Total |      1,438      100.00

-> tabulation of trnsmsn0

 Having sex |
       with |
someone who |
has AIDS is |
 one way of |
 getting it |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |         87        6.02        6.02
          1 |      1,357       93.98      100.00
------------+-----------------------------------
      Total |      1,444      100.00

. *** Appendix2 : Behavior variables
. *** Note: we do not use all of the following variables in the
analysis.
. * Mean and standard deviation
. tabstat condom prost2 oral nocondom anal protect1 careful test
monogamy ivdu0 ///
> partners partd partner2 etoh etohd ///
> age0 age1317 age1822 age2327 agenosex, columns(statistics)
statistics(mean sd)

    variable |      mean        sd
-------------+--------------------
      condom |  .4978571  .5001741
      prost2 |  .9805535  .1381399
        oral |  .9178886  .2746351
    nocondom |  .4698368  .4992666
        anal |  .9568082  .2033631
    protect1 |  .9776692  .1478085
     careful |  .9455446  .2269945
        test |  .4426685  .4968749
    monogamy |  .8311307  .3747741
       ivdu0 |  .9523476  .2131044
    partners |  .9748594  .1028747
       partd |  .9268636  .2604519
    partner2 |  .9617149  .1284428
        etoh |  .9449861  .1664947
       etohd |  .8607242  .3463547
        age0 |  .4536713  .2900776
     age1317 |  .4615385  .4986929
     age1822 |  .2685315  .4433506
     age2327 |  .0538462  .2257928
    agenosex |  .1636364  .3700747
----------------------------------

. * Tabulations of recoded variables
```

```
. tab1 condom prost2 oral nocondom anal protect1 careful test
monogamy ivdu0 ///
> partners partd partner2 etoh etohd ///
> age0 age1317 age1822 age2327 agenosex

-> tabulation of condom


  I use a condom, |
    have sex with |
 only one person, |
  or abstain from |
sexual activity b |      Freq.     Percent        Cum.
------------------+-----------------------------------
not safe behavior |        703       50.21       50.21
    safe behavior |        697       49.79      100.00
------------------+-----------------------------------
            Total |      1,400      100.00

-> tabulation of prost2

  In the last six |
   months, I have |
   Had sex with a |
       prostitute |      Freq.     Percent        Cum.
------------------+-----------------------------------
not safe behavior |         26        1.94        1.94
    safe behavior |      1,311       98.06      100.00
------------------+-----------------------------------
            Total |      1,337      100.00

-> tabulation of oral

     Had oral sex |      Freq.     Percent        Cum.
------------------+-----------------------------------
not safe behavior |        112        8.21        8.21
    safe behavior |      1,252       91.79      100.00
------------------+-----------------------------------
            Total |      1,364      100.00

-> tabulation of nocondom

      Had vaginal |
      intercourse |
 without a condom |      Freq.     Percent        Cum.
------------------+-----------------------------------
not safe behavior |        747       53.02       53.02
    safe behavior |        662       46.98      100.00
------------------+-----------------------------------

            Total |      1,409      100.00

-> tabulation of anal

     Had anal sex |      Freq.     Percent        Cum.
```

```
------------------+-----------------------------------
not safe behavior |         59        4.32        4.32
    safe behavior |      1,307       95.68      100.00
------------------+-----------------------------------
            Total |      1,366      100.00

-> tabulation of protect1

   There is still |
  time to protect |
   myself against |
             AIDS |      Freq.     Percent        Cum.
------------------+-----------------------------------
not safe behavior |         32        2.23        2.23
    safe behavior |      1,401       97.77      100.00
------------------+-----------------------------------
            Total |      1,433      100.00

-> tabulation of careful

I am very careful |
 about who I have |
         sex with |      Freq.     Percent        Cum.
------------------+-----------------------------------
not safe behavior |         77        5.45        5.45
    safe behavior |      1,337       94.55      100.00
------------------+-----------------------------------
            Total |      1,414      100.00

-> tabulation of test

I have had an HIV |
             test |      Freq.     Percent        Cum.
------------------+-----------------------------------
not safe behavior |        802       55.73       55.73
    safe behavior |        637       44.27      100.00
------------------+-----------------------------------
            Total |      1,439      100.00

-> tabulation of monogamy

  I only have sex |
 with one person, |
  my husband/wife |      Freq.     Percent        Cum.
------------------+-----------------------------------
not safe behavior |        230       16.89       16.89
    safe behavior |      1,132       83.11      100.00
------------------+-----------------------------------
            Total |      1,362      100.00

-> tabulation of ivdu0

  I have injected |
drugs in the past |      Freq.     Percent        Cum.
------------------+-----------------------------------
```

```
not safe behavior |         68        4.77        4.77
    safe behavior |      1,359       95.23      100.00
------------------+-----------------------------------
            Total |      1,427      100.00

-> tabulation of partners

   How many |
     sexual |
   partners |
   have you |
 had in the |
     last 3 |
    months? |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |          2        0.14        0.14
        .25 |         11        0.77        0.91
         .5 |         11        0.77        1.69
        .75 |         80        5.63        7.31
          1 |      1,318       92.69      100.00
------------+-----------------------------------
      Total |      1,422      100.00

-> tabulation of partd

Moderate partners |
   3 months dummy |      Freq.     Percent        Cum.
------------------+-----------------------------------
not safe behavior |        104        7.31        7.31
    safe behavior |      1,318       92.69      100.00
------------------+-----------------------------------
            Total |      1,422      100.00

-> tabulation of partner2

   How many |
     sexual |
   partners |
   have you |
 had in the |
 last year? |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |          1        0.07        0.07
        .25 |         24        1.69        1.76
         .5 |         17        1.20        2.96
        .75 |        107        7.55       10.52
          1 |      1,268       89.48      100.00
------------+-----------------------------------
      Total |      1,417      100.00

-> tabulation of etoh

  How often |
    do you |
     drink |
```

```
   alcohol? |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |         21        1.46        1.46
        .25 |         16        1.11        2.58
         .5 |         21        1.46        4.04
        .75 |        142        9.89       13.93
          1 |      1,236       86.07      100.00
------------+-----------------------------------
      Total |      1,436      100.00

-> tabulation of etohd

Moderate drinking |
            dummy |      Freq.     Percent        Cum.
------------------+-----------------------------------
not safe behavior |        200       13.93       13.93
    safe behavior |      1,236       86.07      100.00
------------------+-----------------------------------
            Total |      1,436      100.00

-> tabulation of age0

 How old were you |
   the first time |
     you had sex? |      Freq.     Percent        Cum.
------------------+-----------------------------------
not safe behavior |         75        5.24        5.24
              .25 |        660       46.15       51.40
               .5 |        384       26.85       78.25
              .75 |         77        5.38       83.64
    safe behavior |        234       16.36      100.00
------------------+-----------------------------------
            Total |      1,430      100.00

-> tabulation of age1317

 age 13-17, |
 12 omitted |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        770       53.85       53.85
          1 |        660       46.15      100.00
------------+-----------------------------------
      Total |      1,430      100.00


-> tabulation of age1822

 age 18-22, |
 12 omitted |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,046       73.15       73.15
          1 |        384       26.85      100.00
------------+-----------------------------------
      Total |      1,430      100.00
```

```
-> tabulation of age2327

 age 23-27, |
 12 omitted |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,353       94.62       94.62
          1 |         77        5.38      100.00
------------+-----------------------------------
      Total |      1,430      100.00

-> tabulation of agenosex

not yet had |
    sex, 12 |
    omitted |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,196       83.64       83.64
          1 |        234       16.36      100.00
------------+-----------------------------------
      Total |      1,430      100.00

. *** Appendix3 : Demographics and media exposure variables
. *** Note: we do not use all of the following variables in the
analysis.
. * Mean and standard deviation
. tabstat gender age agesqr read nowmarried catholic protestant
primschool secschool univschool  ///
> married ed religion watchtv lstnrad watchtv2 lstnrad2 tv radio
watchtvd lstnrad_d ///
> watchtv1h watchtv2h watchtv3h watchtv4h lstnrad1h lstnrad2h
lstnrad3h ///
> lstnrad4h, columns(statistics) statistics(mean sd)

    variable |      mean        sd
-------------+--------------------
      gender |    .24375  .4294928
         age |  24.42867  7.147668
      agesqr |  647.8137  379.4788
        read |  .8973464   .303612
  nowmarried |  .5990271  .4902659
    catholic |  .4335664  .4957403
  protestant |  .2888112  .4533685
  primschool |  .3767409  .4847379
   secschool |  .4860724  .4999801
  univschool |  .0612813  .2399292
     married |  1.419041  .5380632
          ed |  1.836351  .8457899
    religion |  1.844056  .8290663
     watchtv |   2.10749  1.537037
     lstnrad |  3.206801  1.021428
    watchtv2 |  2.386694  1.137625
    lstnrad2 |  2.503827  1.406122
          tv |  .8530839   .354145
       radio |  .8786408  .3266576
    watchtvd |  .6941748  .4609159
```

```
   lstnrad_d |  .6689799  .4707436
   watchtv1h |  .2952183   .456299
   watchtv2h |  .2931393  .4553596
   watchtv3h |  .0907831     .2874
   watchtv4h |  .0582121  .2342252
   lstnrad1h |  .2282533  .4198528
   lstnrad2h |   .203897  .4030336
   lstnrad3h |  .0925539  .2899072
   lstnrad4h |  .1475296  .3547565
-------------------------------------

. * Tabulations of recoded variables
. tab1 gender age agesqr read nowmarried catholic protestant
primschool secschool univschool  ///
> married ed religion watchtv lstnrad watchtv2 lstnrad2 tv radio
watchtvd lstnrad_d ///
> watchtv1h watchtv2h watchtv3h watchtv4h lstnrad1h lstnrad2h
lstnrad3h lstnrad4h

-> tabulation of gender

 Male dummy |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,089       75.63       75.63
          1 |        351       24.38      100.00
------------+-----------------------------------
      Total |      1,440      100.00

-> tabulation of age

        age |      Freq.     Percent        Cum.
------------+-----------------------------------
         15 |         99        6.86        6.86
         16 |         99        6.86       13.71
         17 |         87        6.02       19.74
         18 |         82        5.68       25.42
         19 |        100        6.93       32.34
         20 |         80        5.54       37.88
         21 |         63        4.36       42.24
         22 |         77        5.33       47.58
         23 |         80        5.54       53.12
         24 |         56        3.88       56.99
         25 |         52        3.60       60.60
         26 |         51        3.53       64.13
         27 |         46        3.19       67.31
         28 |         50        3.46       70.78
         29 |         59        4.09       74.86
         30 |         59        4.09       78.95
         31 |         22        1.52       80.47
         32 |         35        2.42       82.89
         33 |         30        2.08       84.97
         34 |         28        1.94       86.91
         35 |         35        2.42       89.34
         36 |         30        2.08       91.41
         37 |         23        1.59       93.01
```

```
         38 |         38        2.63       95.64
         39 |         63        4.36      100.00
------------+-----------------------------------
      Total |      1,444      100.00

-> tabulation of agesqr

     agesqr |      Freq.     Percent        Cum.
------------+-----------------------------------
        225 |         99        6.86        6.86
        256 |         99        6.86       13.71
        289 |         87        6.02       19.74
        324 |         82        5.68       25.42
        361 |        100        6.93       32.34
        400 |         80        5.54       37.88
        441 |         63        4.36       42.24
        484 |         77        5.33       47.58
        529 |         80        5.54       53.12
        576 |         56        3.88       56.99
        625 |         52        3.60       60.60
        676 |         51        3.53       64.13
        729 |         46        3.19       67.31
        784 |         50        3.46       70.78
        841 |         59        4.09       74.86
        900 |         59        4.09       78.95
        961 |         22        1.52       80.47
       1024 |         35        2.42       82.89
       1089 |         30        2.08       84.97
       1156 |         28        1.94       86.91
       1225 |         35        2.42       89.34
       1296 |         30        2.08       91.41
       1369 |         23        1.59       93.01
       1444 |         38        2.63       95.64
       1521 |         63        4.36      100.00
------------+-----------------------------------
      Total |      1,444      100.00

-> tabulation of read

       read |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        147       10.27       10.27
          1 |      1,285       89.73      100.00
------------+-----------------------------------
      Total |      1,432      100.00

-> tabulation of nowmarried

 nowmarried |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        577       40.10       40.10
          1 |        862       59.90      100.00
------------+-----------------------------------
      Total |      1,439      100.00
```

```
-> tabulation of catholic

  catholic, |
    omitted |
      other |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        810       56.64       56.64
          1 |        620       43.36      100.00
------------+-----------------------------------
      Total |      1,430      100.00

-> tabulation of protestant

protestant, |
    omitted |
      other |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,017       71.12       71.12
          1 |        413       28.88      100.00
------------+-----------------------------------
      Total |      1,430      100.00

-> tabulation of primschool

    primary |
    school, |
 omitted no |
  schooling |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        895       62.33       62.33
          1 |        541       37.67      100.00
------------+-----------------------------------
      Total |      1,436      100.00

-> tabulation of secschool

  secondary |
    school, |
 omitted no |
  schooling |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        738       51.39       51.39
          1 |        698       48.61      100.00
------------+-----------------------------------
      Total |      1,436      100.00

-> tabulation of univschool

university, |
 omitted no |
  schooling |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,348       93.87       93.87
          1 |         88        6.13      100.00
------------+-----------------------------------
```

```
      Total |      1,436      100.00

-> tabulation of married

    married |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |        862       59.90       59.90
          2 |        558       38.78       98.68
          3 |         12        0.83       99.51
          4 |          7        0.49      100.00
------------+-----------------------------------
      Total |      1,439      100.00

-> tabulation of ed

         ed |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |        541       37.67       37.67
          2 |        698       48.61       86.28
          3 |         88        6.13       92.41
          4 |        109        7.59      100.00
------------+-----------------------------------
      Total |      1,436      100.00

-> tabulation of religion

   religion |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |        620       43.36       43.36
          2 |        413       28.88       72.24
          3 |        397       27.76      100.00
------------+-----------------------------------
      Total |      1,430      100.00

-> tabulation of watchtv

          watchtv |      Freq.     Percent        Cum.
------------------+-----------------------------------
            daily |        875       60.68       60.68
2-3 days per week |        126        8.74       69.42
4-5 times a month |         21        1.46       70.87
           Rarely |        251       17.41       88.28
I do not watch TV |        169       11.72      100.00
------------------+-----------------------------------
            Total |      1,442      100.00

-> tabulation of lstnrad

    lstnrad |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |        148       10.27       10.27
          2 |         36        2.50       12.77
          3 |        780       54.13       66.90
          4 |        324       22.48       89.38
          5 |        153       10.62      100.00
```

```
------------+-----------------------------------
      Total |      1,441      100.00

-> tabulation of watchtv2

            watchtv2 |      Freq.     Percent        Cum.
---------------------+-----------------------------------
  30 minutes or less |        379       26.26       26.26
30 minutes to 1 hour |        426       29.52       55.79
          1-2  hours |        423       29.31       85.10
           3-4 hours |        131        9.08       94.18
   more than 4 hours |         84        5.82      100.00
---------------------+-----------------------------------
               Total |      1,443      100.00

-> tabulation of lstnrad2

   lstnrad2 |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |        471       32.78       32.78
          2 |        328       22.83       55.60
          3 |        293       20.39       75.99
          4 |        133        9.26       85.25
          5 |        212       14.75      100.00
------------+-----------------------------------
      Total |      1,437      100.00

-> tabulation of tv

         tv |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        212       14.69       14.69
          1 |      1,231       85.31      100.00
------------+-----------------------------------
      Total |      1,443      100.00

-> tabulation of radio

      radio |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        175       12.14       12.14
          1 |      1,267       87.86      100.00
------------+-----------------------------------
      Total |      1,442      100.00

-> tabulation of watchtvd

  1 - watch |
tv daily or |
  weekly, 0 |
   monthly, |
  rarely or |
      never |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        441       30.58       30.58
```

```
          1 |      1,001       69.42      100.00
------------+-----------------------------------
      Total |      1,442      100.00

-> tabulation of lstnrad_d

 1 - listen |
radio daily |
 or weekly, |
0 rarely or |
      never |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        477       33.10       33.10
          1 |        964       66.90      100.00
------------+-----------------------------------
      Total |      1,441      100.00

-> tabulation of watchtv1h

 1 - listen |
   radio 30 |
min-1 hour, |
 omitted 30 |
    minutes |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,017       70.48       70.48
          1 |        426       29.52      100.00
------------+-----------------------------------
      Total |      1,443      100.00

-> tabulation of watchtv2h

 1 - listen |
    radio 2 |
     hours, |
 omitted 30 |
    minutes |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,020       70.69       70.69
          1 |        423       29.31      100.00
------------+-----------------------------------
      Total |      1,443      100.00

-> tabulation of watchtv3h

 1 - listen |
  radio 3-4 |
     hours, |
 omitted 30 |
    minutes |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,312       90.92       90.92
          1 |        131        9.08      100.00
------------+-----------------------------------
      Total |      1,443      100.00
```

```
-> tabulation of watchtv4h

 1 - listen |
 radio more |
     than 4 |
     hours, |
 omitted 30 |
    minutes |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,359       94.18       94.18
          1 |         84        5.82      100.00
------------+-----------------------------------
      Total |      1,443      100.00

-> tabulation of lstnrad1h

 1 - listen |
   radio 30 |
min-1 hour, |
 omitted 30 |
    minutes |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,109       77.17       77.17
          1 |        328       22.83      100.00
------------+-----------------------------------
      Total |      1,437      100.00

-> tabulation of lstnrad2h

 1 - listen |
    radio 2 |
     hours, |
 omitted 30 |
    minutes |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,144       79.61       79.61
          1 |        293       20.39      100.00
------------+-----------------------------------
      Total |      1,437      100.00

-> tabulation of lstnrad3h

 1 - listen |
  radio 3-4 |
     hours, |
 omitted 30 |
    minutes |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,304       90.74       90.74
          1 |        133        9.26      100.00
------------+-----------------------------------
      Total |      1,437      100.00

-> tabulation of lstnrad4h
```

```
 1 - listen |
 radio more |
     than 4 |
     hours, |
 omitted 30 |
    minutes |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      1,225       85.25       85.25
          1 |        212       14.75      100.00
------------+-----------------------------------
      Total |      1,437      100.00

. *** Appendix4 : Sus and Sev variables
. *** Note: we do not use all of the following variables in the
analysis.
. * Mean and standard deviation
. tabstat problemd neighbor threat chance scary know prev afraid
chance2 ///
> protect chance3 riskd risk2d prost partner3 chance4 safe,
columns(statistics) statistics(mean sd)

    variable |      mean        sd
-------------+--------------------
    problemd |  .5569532  .4969194
    neighbor |   .513947  .4999798
      threat |  .9547354  .2079564
      chance |  .6134454  .4871307
       scary |  .9142857  .2800393
        know |  .2377964  .4258823
        prev |  .9265419  .2609774
      afraid |  .8660652  .3407005
     chance2 |  .3342638  .4718971
     protect |  .1947149  .3961188
     chance3 |  .4345404  .4958692
       riskd |  .4009831  .4902698
      risk2d |   .430575  .4953304
       prost |   .069735  .2547887
    partner3 |  .0573026  .2325011
     chance4 |  .0797203  .2709544
        safe |  .3026685  .4595744
----------------------------------

. * Tabulations of recoded variables.
. tab1 problemd neighbor threat chance scary know prev afraid
chance2 ///
> protect chance3 riskd risk2d prost partner3 chance4 safe

-> tabulation of problemd

   In my community |
            HIV is |
      serious-some |
  problem, 0 small |      Freq.     Percent        Cum.
-------------------+-----------------------------------
```

```
 perceive low susc |        634       44.30       44.30
perceive high susc |        797       55.70      100.00
-------------------+-----------------------------------
             Total |      1,431      100.00

-> tabulation of neighbor

      People in my |
  neighborhood are |
      likely to be |
infected with AIDS |      Freq.     Percent        Cum.
-------------------+-----------------------------------
 perceive low susc |        697       48.61       48.61
perceive high susc |        737       51.39      100.00
-------------------+-----------------------------------
             Total |      1,434      100.00

-> tabulation of threat

  AIDS is a health |
threat that I take |
    very seriously |      Freq.     Percent        Cum.
-------------------+-----------------------------------
 perceive low susc |         65        4.53        4.53
perceive high susc |      1,371       95.47      100.00
-------------------+-----------------------------------
             Total |      1,436      100.00

-> tabulation of chance

   There is a good |
 chance I will get |
   AIDS within the |
      next 5 years |      Freq.     Percent        Cum.
-------------------+-----------------------------------
 perceive low susc |        552       38.66       38.66
perceive high susc |        876       61.34      100.00

-------------------+-----------------------------------
             Total |      1,428      100.00

-> tabulation of scary

       AIDS is the |
scariest disease I |
              know |      Freq.     Percent        Cum.
-------------------+-----------------------------------
 perceive low susc |        123        8.57        8.57
perceive high susc |      1,312       91.43      100.00
-------------------+-----------------------------------
             Total |      1,435      100.00

-> tabulation of know

    I know someone |
```

```
 infected with HIV |      Freq.     Percent        Cum.
-------------------+-----------------------------------
 perceive low susc |      1,093       76.22       76.22
perceive high susc |        341       23.78      100.00
-------------------+-----------------------------------
             Total |      1,434      100.00

-> tabulation of prev

     The number of |
  people with AIDS |
     is increasing |      Freq.     Percent        Cum.
-------------------+-----------------------------------
 perceive low susc |        106        7.35        7.35
perceive high susc |      1,337       92.65      100.00
-------------------+-----------------------------------
             Total |      1,443      100.00

-> tabulation of afraid

   I am afraid of |
     getting AIDS |      Freq.     Percent        Cum.
------------------+-----------------------------------
 perceive low sev |        193       13.39       13.39
perceive high sev |      1,248       86.61      100.00
------------------+-----------------------------------
            Total |      1,441      100.00

-> tabulation of chance2

 I am less likely |
 than most people |
      to get AIDS |      Freq.     Percent        Cum.
------------------+-----------------------------------
 perceive low sev |        954       66.57       66.57
perceive high sev |        479       33.43      100.00
------------------+-----------------------------------
            Total |      1,433      100.00

-> tabulation of protect

    I know how to |
   protect myself |
        from AIDS |      Freq.     Percent        Cum.
------------------+-----------------------------------
 perceive low sev |      1,158       80.53       80.53
perceive high sev |        280       19.47      100.00
------------------+-----------------------------------
            Total |      1,438      100.00

-> tabulation of chance3

Someone I know is |
    likely to get |
             AIDS |      Freq.     Percent        Cum.
```

```
------------------+-----------------------------------
 perceive low sev |        812       56.55       56.55
perceive high sev |        624       43.45      100.00
------------------+-----------------------------------
            Total |      1,436      100.00

-> tabulation of riskd

  What risk dummy |      Freq.     Percent        Cum.
------------------+-----------------------------------
 perceive low sev |        853       59.90       59.90
perceive high sev |        571       40.10      100.00
------------------+-----------------------------------
            Total |      1,424      100.00

-> tabulation of risk2d

   In comparison, |
  what risk dummy |      Freq.     Percent        Cum.
------------------+-----------------------------------
 perceive low sev |        812       56.94       56.94
perceive high sev |        614       43.06      100.00
------------------+-----------------------------------
            Total |      1,426      100.00

-> tabulation of prost

   I have or have |
 had in the past, |
         sex with |
      prostitutes |      Freq.     Percent        Cum.
------------------+-----------------------------------
 perceive low sev |      1,334       93.03       93.03
perceive high sev |        100        6.97      100.00
------------------+-----------------------------------
            Total |      1,434      100.00

-> tabulation of partner3

  I have sex with |
   various people |      Freq.     Percent        Cum.
------------------+-----------------------------------
 perceive low sev |      1,349       94.27       94.27
perceive high sev |         82        5.73      100.00
------------------+-----------------------------------
            Total |      1,431      100.00

-> tabulation of chance4

    I have a high |
chance of getting |
  AIDS because of |
  my past history |      Freq.     Percent        Cum.
------------------+-----------------------------------
```

```
 perceive low sev |      1,316       92.03       92.03
perceive high sev |        114        7.97      100.00
------------------+-----------------------------------
            Total |      1,430      100.00

-> tabulation of safe

    I know how to |
    have safe sex |      Freq.     Percent        Cum.
------------------+-----------------------------------
 perceive low sev |        993       69.73       69.73
perceive high sev |        431       30.27      100.00
------------------+-----------------------------------
            Total |      1,424      100.00
```