

**SOCIO-DEMOGRAPHIC FACTORS ASSOCIATED TO CONDOM USE IN THE  
CAMEROON MILITARY**

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# **SOCIO-DEMOGRAPHIC FACTORS ASSOCIATED TO CONDOM USE IN THE CAMEROON MILITARY**

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University of Pittsburgh, 2010

With an average HIV prevalence rate more than two times higher than the general population, the Cameroon military is in need of effective HIV/AIDS prevention intervention programs. The aim of this study is to examine socio-demographic factors associated to condom use among military personnel through an existing HIV prevention program and offer recommendations for HIV prevention interventions to the Cameroon military.

**Objectives:** Analyze baseline condom use data collected from the 2005 HIV surveillance and behavioral study of the Armed Forces of Cameroon. Provide feedback to GVFI to effectively utilize this information for the 2009/2010 HIV/AIDS surveillance and intervention plan targeting the Armed Forces of Cameroon.

**Methods:** The data included responses from a behavioral questionnaire and blood samples (n=2154) obtained from military personnel in Cameroon. Estimated population proportions of condom use data were compared for each of the following socio-demographic variables: military region, age, gender, marital status, military rank, and religion. Chi-square analyses were utilized to test for significance within each socio-demographic variable. Multivariate logistical regressions were executed based on the significant findings of the chi-square tests. Statistical analyses were completed using SYSTAT 13 and SAS 9.2.

**Results:** Specific populations of military personnel demonstrated less condom use, including individuals from military Region 3, older personnel, women, married individuals, non-commissioned officers, and non-Christians.

**Discussion:** This research has shown that there is a relationship between certain socio-demographic characteristics and lower reported rates of condom use. This information can be utilized for the new HIV/AIDS intervention prevention plan (2009/2010) targeting the Cameroon military.

**Conclusion:** Training of trainers and peer educator programs targeting specific populations within the military can have an effect on decreasing the current STI/HIV prevalence rate. A multi-dimensional approach that focuses on intensive education at all levels of the military, outreach that includes condom distribution and counseling, and the availability of HIV testing is essential in creating the most effective HIV/AIDS prevention intervention program.

**Implications for public health:** Consistent and proper condom use is a highly effective method for HIV/AIDS prevention. This research provides background data to inform the planning of an HIV intervention prevention program targeting military personnel in Cameroon. Such a program can be adapted for military programs around the world.

## TABLE OF CONTENTS

<b>PREFACE.....</b>	<b>X</b>
<b>1.0 INTRODUCTION.....</b>	<b>1</b>
<b>2.0 BACKGROUND .....</b>	<b>4</b>
<b>2.1 HIV/AIDS AND THE EFFECT ON AFRICAN MILITARIES .....</b>	<b>4</b>
<b>2.2 HIV/AIDS AS A THREAT TO NATIONAL SECURITY .....</b>	<b>6</b>
<b>2.3 HUMAN RIGHTS CONCERNS.....</b>	<b>7</b>
<b>2.4 CURRENT MILITARY EDUCATION PREVENTION PROGRAMS AND POLICIES .....</b>	<b>9</b>
<b>2.5 SUCCESSFUL PEER EDUCATION PROGRAMS IN THE MILITARY .</b>	<b>12</b>
<b>2.6 HIV/AIDS IN THE CAMEROON MILITARY .....</b>	<b>14</b>
<b>2.7 HIV/AIDS POLICIES IN THE CAMEROON MILITARY .....</b>	<b>15</b>
<b>3.0 METHODOLOGY.....</b>	<b>17</b>
<b>3.1 RESEARCH QUESTIONS.....</b>	<b>18</b>
<b>3.2 DATA .....</b>	<b>19</b>
<b>3.3 VARIABLES .....</b>	<b>21</b>
<b>3.4 ANALYSIS .....</b>	<b>24</b>
<b>4.0 RESULTS .....</b>	<b>25</b>
<b>4.1 DESCRIPTIVE STATISTICS .....</b>	<b>25</b>

<b>4.2</b>	<b>CONDOM USE WITH REGULAR SEX PARTNERS .....</b>	<b>25</b>
<b>4.2.1</b>	<b>Multivariate logistical regression regarding condom use with regular sex partners.....</b>	<b>30</b>
<b>4.3</b>	<b>POSITIVE RESPONSE TO CONDOM USE IN THE PAST SIX MONTHS .....</b>	<b>32</b>
<b>4.3.1</b>	<b>Multivariate logistical regression regarding condom use in the past six months.....</b>	<b>36</b>
<b>5.0</b>	<b>DISCUSSION .....</b>	<b>39</b>
<b>5.1</b>	<b>LIMITATIONS OF STUDY.....</b>	<b>44</b>
<b>6.0</b>	<b>CONCLUSION.....</b>	<b>45</b>
<b>6.1</b>	<b>IMPLICATIONS FOR MILITARY POLICY IN CAMEROON.....</b>	<b>47</b>
	<b>APPENDIX A: SURVEY USED IN THE 2005 MILITARY SURVEILLANCE .....</b>	<b>48</b>
	<b>APPENDIX B: IRB APPROVAL.....</b>	<b>56</b>
	<b>APPENDIX C: POPULATION PROPORTION GRAPHS .....</b>	<b>58</b>
	<b>BIBLIOGRAPHY.....</b>	<b>68</b>

## LIST OF TABLES

Table 1. Socio-demographic characteristics of respondents.....	23
Table 2. Percent of participants responding affirmatively to condom use with regular sex partners .....	26
Table 3. Multivariate logistical regression regarding condom use with regular sex partners .....	31
Table 4. Percent of participants responding affirmatively to condom use in the past six months	32
Table 5. Multivariate logistical regression regarding condom use in the past six months .....	38

## LIST OF FIGURES

Figure 1. Regional military map of Cameroon .....	20
Figure 2. Positive response to condom use with regular sex partners by military region .....	27
Figure 3. Positive response to condom use in the past six months by military rank .....	35

## **PREFACE**

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I would like to thank everyone at GVFI Cameroon for allowing me to perform this research and for showing me the beauty of their country. I would like to especially thank Dr. Ubald Tamoufe, the Regional Director of GVFI Cameroon, for taking the time to show me the amazing work GVFI is doing to prevent infectious diseases around the world, for allowing me to be fully involved in the planning of two different STI/HIV/AIDS prevention intervention programs, and for providing me with the necessary resources to complete my research project. I want to express my gratitude to Beatrice Mbongu for her friendship, guidance, and logistical support throughout my stay in Cameroon. I want to thank Raph Medang for showing me proper techniques in survey development and fieldwork methodology. I also would like to thank Edmund Tadiesse, consultant for GVFI, for sharing his expertise in data collection and planning of field activities.

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## 1.0 INTRODUCTION

More than 22 million soldiers are serving in armed forces around the world. Military personnel are a specific population at high risk of exposure to sexually transmitted infections (STIs) including human immunodeficiency virus (HIV). In many countries, the risk of contracting HIV poses a much greater hazard to soldiers than the inherent danger of their military profession (Yeager 2000; Kingma and Yeager 2005). During peacetime, STI rates among military personnel can be two to five times higher than in the general population. During times of conflict, this rate can be fifty percent greater than the general population of their home country, because conflict conditions often result in an increase in high risk sexual activity (UNAIDS 1998).

Military personnel are an exceptionally vulnerable group due to the high stress nature of their work environment, mobility, age, and professional ethos (Heinecken 2003; Sagala 2008). In general, militaries are comprised of a young, sexually active male workforce. Most African militaries are comprised of individuals in the age group at highest risk for HIV infection. Half of all new HIV infections occur in people aged 15-24, as they are the most sexually active age group (UNAIDS 2003; Kingma and Yeager 2005). Certain distinct characteristics make military personnel more vulnerable to HIV infection such as risk taking behavior and self-perceptions of invincibility, which are valued qualities of any military. Some of this behavior may be learned through military training while another part may be learned informally through hyper-masculine

military culture (Kane 1993; UNAIDS 1998; Bianchi and Popper 2000; Yeager et al. 2000; Sagala 2008).

During conflict, it is critical for soldiers to take risks without asking any questions. However, outside of a combat situation these behaviors often serve no purpose except to make soldiers more vulnerable to risk taking behaviors. Aggressiveness is another valued characteristic of personnel, which may encourage soldiers to view and pursue sex as a conquest. These particular characteristics may increase the likelihood that soldiers exert sexual power and engage in anonymous, purchased, or coercive sex (UNAIDS 1998).

The most significant factor that makes military personnel vulnerable to higher rates of HIV infection is the practice of posting individuals far from their home communities (Adefolalu 1999; Hendrix and Daniell 1999; Heinecken 2005). In many African countries because of conscription or voluntary service, many youth spend at least one year or more in the military. Military personnel are often required to spend long periods of time away from their families and friends, removing them from their normal social controls and regular sex partner(s). They may therefore seek alternative ways to deal with loneliness, stress, and boredom and are more often influenced by peer pressure (Kingma and Yeager 2005). Soldiers often have more money than the local population, drink more alcohol, and engage in more sexual activity to fulfill emotional needs (Kane 1993; Wollants et al. 1995; Bianchi and Popper 2000). Conflict regions frequently have higher prevalence rates of HIV due to unstable governments and a breakdown in the educational system and medical infrastructures (Moodie et al. 2000; Heinecken 2003; UNAIDS 2003; Bing et al. 2008; Kilner 2009). As these young people return to civilian life HIV/AIDS also poses a threat to their families and social contacts since they are engaging in unprotected

sex, becoming infected with STIs and HIV, and transmitting these infections to wives and sexual partners at home.

This thesis examines the effects HIV/AIDS has on African militaries. It considers how HIV/AIDS plays a major role in decreasing military effectiveness and readiness and how the virus is viewed as a threat to national security in many countries. It reviews current policies and prevention programs established by militaries around the world.

This thesis then discusses HIV/AIDS in the Cameroon military and the HIV/AIDS surveillance method designed by the Global Viral Forecasting Initiative (GVFI). The aim of the surveillance is to periodically monitor the progression of HIV in the Cameroon military and evaluate the success of the current STI/HIV prevention interventions.

The objectives of this study are to analyze condom use data collected by GVFI in 2005 to assist in the development of new intervention prevention programs targeting military personnel in Cameroon. Based on the associations between condom use by military personnel and socio-demographic factors, recommendations are made to GVFI to consider for the formation of new intervention programming.

## **2.0 BACKGROUND**

From an historical perspective, infectious diseases have significantly reduced the fighting capacity of military forces and created difficulties for military planners (Smallman-Raynor and Cliff 2004). There is an immediate effect on military personnel and preparedness. As Sagala (2006) clearly states,

the HIV/AIDS pandemic undermines military organizational effectiveness through its medium and long-term consequences. This results in capacity deficits and personnel attrition, increased costs for replacing deceased staff, absenteeism, loss of morale, internal dislocations, and spiraling military health costs (pg 57).

### **2.1 HIV/AIDS AND THE EFFECT ON AFRICAN MILITARIES**

HIV has critically affected militaries from many parts of Africa. Statistics show that more than 15 percent of military populations in 20 developing countries are infected with HIV. In some African countries, this number is as high as 50 percent. Armies from Malawi, Rwanda, South Africa, Zambia, Nigeria, and Zimbabwe have been forced to modify their operational command (the method by which commanders assign missions or tasks to subordinates, deploy units, and reassign forces) due to HIV/AIDS related illness and death among higher ranking officers (Population Action International 2004). For example, in South Africa seven out of every ten

military personnel deaths are AIDS-related (Prins 2004). AIDS-related illness has killed more soldiers in Zambia than combat-related deaths from all their military operations combined since their independence in 1964 (Rupiya 2006). In Zimbabwe, 55% of its troops are HIV positive, and 75% of those infected troops will succumb to AIDS in the next year (Essa 2008). In Kenya at the Armed Forces Memorial Hospital in Nairobi, 50 to 60 percent of all hospital beds are taken by HIV/AIDS infected soldiers, and six to ten soldiers die every week from AIDS-related illness (Beelen 2003). These staggering figures make it clear that HIV has taken a massive toll on many African militaries.

HIV/AIDS has been shown to disrupt programming and service delivery complicated by increased costs for recruitment, training, and replacement of deceased staff (Ostergard 2002; Singer 2002; Heinecken 2003; Rode 2005). Some militaries in Sub-Saharan Africa are finding it increasingly difficult to afford the personnel and resource losses they are facing due to HIV/AIDS. In Africa, militaries, due to the impact of HIV, are becoming increasingly part of the global HIV/AIDS humanitarian crisis requiring foreign assistance to aid in the fight against HIV in their country. Most militaries, however, are excluded from foreign aid assistance (Kingma and Yeager 2005) because they are intended to be funded by their own governments.

Without proper treatment and counseling, HIV easily affects the mental and physical capabilities of the people it infects and leaves them vulnerable to psychosocial distress and opportunistic infections. High rates of HIV infection in militaries can have major consequences on operational effectiveness (Ostergard 2002; Heinecken 2003; Sagala 2008). Organizational problems related to HIV/AIDS include poor military performance and a breakdown in military discipline from a loss of highly skilled military personnel (Sagala 2006). If a military has a large number of personnel with weakened immune systems due to HIV infection this can ultimately

affect military missions, deployment, national defense, and morale among troops (Elbe 2002; Smallman-Raynor and Cliff 2004). Therefore, HIV infection can cause serious challenges for security and stability within a country.

## **2.2 HIV/AIDS AS A THREAT TO NATIONAL SECURITY**

African militaries differ from other countries' militaries due to the impact of HIV/AIDS within their ranks, and it is seen as a direct threat to security (Ostergard 2002). The UN Security Council declared that HIV/AIDS was not only a humanitarian crisis for health and development but also a security threat "as destabilizing as any war...that threatens not just individual citizens, but the very institutions that define and defend the character of society" (Holbrooke 2000, <http://www.uninfo.org/wf-archive/2000/000707/epf507.htm>).

HIV and AIDS have a devastating effect on militaries, as well as a significant effect on civilian populations (Fourie and Schonteich 2001). Peacekeeping missions to areas of high HIV prevalence pose a threat to soldiers deployed in these conflict areas because soldiers often engage in unprotected sexual encounters. For the same reasons, militaries with high HIV prevalence rates that are deployed on peacekeeping missions to areas of low HIV rates can pose a threat to the civilian population. In some instances, countries have rejected accepting peacekeeping forces for fear that they will infect the local population (Ban 2003). Peacekeepers tend to have a higher income than the local population, they are outside of their normal community constraints, and may seek outlets for boredom, loneliness, and stress. These are all contributing factors that drive the local sex market and the engagement of peacekeepers in casual unprotected sex with multiple partners (UNAIDS 2005).

HIV and other infectious diseases flourish in complex humanitarian emergencies as a result of the breakdown in the social, political, and economic structure of a community (CSIS 2000; Connolly et al. 2004; Spiegel 2004; Kingma and Yeager 2005). Refugees and internally displaced persons often move into situations of high vulnerability for contract STIs/HIV where there is no social structure and no medical assistance. Peacekeepers are strategically deployed to help displaced persons, which place them in an environment at increased risk for contracting HIV and other infectious diseases. In 2000, the United Nations Council recognized HIV/AIDS in Africa as a threat to international peace and security (UN Security Council 2000). The UN Security Council developed a resolution to ensure that peacekeeping troops were trained in STI/HIV/AIDS education. However, few funds have been put forth by the UN's Department of Peacekeeping Operations for STI/HIV/AIDS prevention and education, relying mostly on the countries that provide the troops to conduct education sessions, testing and counseling, condom promotion, and treatment (Kingma and Yeager 2005). STI/HIV/AIDS training and prevention programming should be a top priority for all troops deployed to conflict regions.

### **2.3 HUMAN RIGHTS CONCERNS**

Most African militaries screen their incoming recruits with an HIV test. Most recruits are denied entry into service if they are found to be HIV positive. Active military personnel who are HIV positive face discrimination in the form of job demotion. In Ethiopia, for example, the army uses HIV negative status as an incentive for job promotion (CCR 2007). Uganda claims that its military is non-discriminatory. However, it gives HIV positive soldiers less strenuous jobs and recruits only negative individuals (Essa 2008). However, in 2008 South Africa's High Court

ruled it unconstitutional for the military to exclude HIV positive people from recruitment, promotion, or deployment (IRNI 2010). In many developing countries, the military provides employment opportunities that may be otherwise difficult to find for many young, uneducated individuals.

Some human rights activists argue that recruiting only HIV negative individuals and not providing them with proper STI/HIV/AIDS education and condoms is shortsighted and does not promote public health (D'Amelio et al. 2001; BBC 2003; Kingma and Yeager 2005). The UN recommends that troops deployed on peacekeeping missions should test negative for HIV. The UN encourages a non-stigmatizing, non-discriminatory environment within the military for HIV-positive personnel. The UN also advises that HIV-positive individuals should be able to carry out all duties in which they are trained to do as long as they are still healthy enough to perform them (UNAIDS 1998). Since many individuals have a higher chance of contracting HIV during their military service, it should be considered an occupational hazard that the military cannot ignore and must take responsibility for (Heywood 1997; Essa 2008).

Others argue that HIV testing at time of recruitment is justified as a fair discriminatory practice since militaries cannot pay for the economic cost of caring for military recruits who have HIV (Heinecken 2003). In addition, militaries need to ensure that their members are ready for action at all times. A defense force with sick or immunocompromised individuals can ultimately impact a military's readiness (Heinecken 2003; Kingma and Yeager 2005; Heinecken and Nel 2009). Periodic mandatory testing can serve as a useful surveillance tool to identify HIV positive personnel in order to provide them with proper care and change their service assignments as necessary (Capelton et al. 2004; Kingma and Yeager 2005). Ultimately as public health dictates individual rights may be denied to protect the health of the greater community.

Policy reform, such as that taken by South Africa's National Defense Force, could reduce social and employment discrimination. Policy reform can also force militaries to take greater responsibility to control HIV within their ranks (Essa 2008). Otherwise militaries may find that they waste human potential while denying human rights (Kingma and Yeager 2005) if they continue to refuse employment to HIV positive individuals.

## **2.4 CURRENT MILITARY EDUCATION PREVENTION PROGRAMS AND POLICIES**

As Gould (1993) notes, "with no vaccine, and no cure, education is all we have" (pg. 178). In order to initiate behavior change, education must be more than just the transfer of knowledge. Education at this level needs to be interactive, motivational, reinforcing, practical, and realistic. A global survey conducted by Yeager et al. (2000) regarding current military programs and policies discovered that 98% of reporting countries had developed some form of educational programming and 84% had developed policies related to HIV/AIDS education. However, only 57% of the reporting militaries offered large-group prevention briefings more than once a year. One military offered a peer-education program. Ninety percent conducted pre-deployment briefings for their soldiers but only 57% offered post-deployment prevention briefings. Regular prevention briefings occurred the least often in Africa compared to other regions of the world. A major problem in providing educational sessions is a lack of sufficient funding for such programs.

It is evident that to decrease new cases of HIV/AIDS, condom distribution and use are critical. Many of the world's militaries have policies promoting condom use, which they provide

during group briefings or in written distributed materials. Only 65% of militaries have policies regarding the free distribution of condoms. Half of these militaries routinely issue condoms while the other half makes them available upon request (Yeager et al. 2000).

HIV testing is conducted in almost all militaries around the world but only 55% have developed actual testing policies. The majority of the testing that is conducted is mandatory either at time of recruitment or pre-deployment. Only 21% of the world's militaries provide periodic testing. Some militaries, including Cameroon, reject recruits if they are found to be HIV positive while others do not deploy them overseas. Almost all militaries provide voluntary testing for their soldiers. Soldiers are therefore likely to be tested for HIV but they are not given proper counseling regarding their health status and sexual behavior. In countries that require mandatory testing, 62% offer pre-test counseling. Of countries that offer post-test results almost all conduct post-test counseling and encourage notification of sex partners. In most militaries (93%) an AIDS-related diagnosis results in discharge from service (Yeager et al. 2000).

Bing et al. (2005) reviewed four intervention programs targeted for militaries and assessed the level of success in changing HIV risk behaviors among military personnel. One intervention was a single approach/single session program conducted by Jenkins et al. (2000) for U.S. military personnel seeking care in an STI clinic. This approach utilized a 20-minute single session intended to reduce STIs/HIV among soldiers. The researchers compared the results of pre- and post-intervention evaluations between the control and study groups. The results revealed that individuals in the intervention groups were more likely to abstain from sex when they were in a period of active infection compared to the control group. There was no significant difference between the groups regarding partner notification, changes in alcohol consumption, condom use, or number of high risk partners in two week and two month follow-up evaluations.

A second program is a single approach/multiple session intervention known as SHIP assessed by Boyer et al. (2001) given to U.S. Marines on ships before they went ashore on liberty visits. The SHIP program consisted of four two-hour multi-component group sessions and a two-hour booster session. Pre- and post-intervention tests were given and the results analyzed. Individuals in the intervention groups were significantly less likely to be characterized as a sexual risk and had higher levels of STI/HIV knowledge compared to the control groups. Booth-Kewley et al. (2001) assessed a version of SHIP given to U.S. Marines in a security guard school. Their study revealed that the intervention group was significantly less likely to report their most recent sexual partner as a stranger compared with the control group. The intervention group was also significantly more likely to have used condoms in the past six months. There were no differences in the number of sex partners, the length of time knowing their most recent sex partner before sex, and the overall number of casual sex partners.

The third program was a 15-month, multiple approach/multiple session intervention conducted by Celentano et al. (2000). The goal of this program was to reduce the incidence of STIs/HIV among Thai male conscripts. In the first component of the program conscripts participated in HIV/AIDS prevention activities. The second part of the program educated higher-ranking individuals (squad leaders, paramedics, chaplains) on HIV/AIDS prevention. The higher-ranking individuals then taught weekly STI/HIV education classes for the conscripts. The third component of the program involved working with the military police to modify the method of STI detection and to increase condom distribution sites. The incidence of STIs/HIV was significantly lower in the intervention group after 15 months but the authors concluded that this was not the result of the intervention since the intervention group reported more visits with commercial sex workers than did the control group.

The fourth program was the nationally based Thai mass media “100% Condom Program.” The aim of this program was to encourage safer sex practices through the distribution of condoms to commercial sex enterprises, enforcement of condom compliance, and provision of educational materials through mass media. Nelson et al. (1996) and Celentano et al. (1998) evaluated this program and revealed that there were significant reductions in military personnel’s activities with commercial sex workers. They also noted a significant decline in STI/HIV incidence rates.

Review of these programs has demonstrated positive intervention effects in health behavior outcomes. Since military personnel are a high-risk population, it is evident that there is a need to implement STI/HIV intervention prevention programs within militaries throughout the world.

## **2.5 SUCCESSFUL PEER EDUCATION PROGRAMS IN THE MILITARY**

Peer education has been a very useful tool in the fight against HIV/AIDS for many years because it focuses on using respected friends, colleagues, and neighbors as a means to effectively disseminate information (Flanagan 1996; UNAIDS 1999; Population Council 1999). Research has shown that peer educator programs can have an effect on decreasing the current STI/HIV prevalence rate within the military. For example, USAID conducted a seven-year peer educator program with the Cambodian Armed Forces (U.S. Department of State 2007). The ‘Peer Education Program’ trained 5,705 peer educators who were responsible for giving multiple education sessions within their units regarding strategies to change sexual risk behaviors. This project has been credited with reducing the HIV infection rate among Cambodian military

personnel by almost half of the previous rate after only seven years. In Ghana, with the assistance of PEPFAR funding, the Armed Forces have successfully trained peer educators to hold sessions for soldiers prior to HIV testing. The peer educators provide fellow soldiers with educational materials prior to deployment, hold STI/HIV education sessions within their units once they have been deployed, and act as role models for behavior change. Due to these efforts, the HIV prevalence rate in the Ghanaian military has decreased between 2000-2005. There has also been a reduction in the number of sex partners and an increase in condom use by soldiers (U.S. Department of State 2006). In the Ugandan People's Defense Forces various prevention efforts including peer education have been attributed to a decrease in the HIV prevalence rate (Kaczor 2002). These examples have demonstrated that peer education in conjunction with other prevention efforts can have a big impact on reducing HIV infection rates within militaries across the globe.

Higher-ranking officers have also proven to be successful STI/HIV/AIDS educators. In Senegal, where the military has been very successful in maintaining a low HIV prevalence rate among its troops, generals are trained by military doctors in HIV prevention strategies. The generals then educate and train their troops and their troop's families about HIV/AIDS (Lom 2001). The Sudanese military also uses high-ranking officers to educate soldiers and the general public about the dangers of HIV. Commanders discuss HIV at large public forums and President Salva Kiir (also the Commander-in-Chief of the Sudanese Army) took a public HIV test (IRNI 2010b). Because of the hierarchical structure of the military, condom use promotion by higher-ranking military personnel can provide the model for younger soldiers and non-commissioned officers to follow and respect.

## **2.6 HIV/AIDS IN THE CAMEROON MILITARY**

Cameroon has a 5.1% adult HIV prevalence rate with an estimated 540,000 currently infected individuals (GVFI Final Report 2005). High risk populations include sex workers, truck drivers, and forces of law and order (FLO) otherwise known as the armed forces. A study conducted in 2002 and 2005 among uniformed services personnel in Cameroon by the Global Viral Forecasting Initiative (GVFI) demonstrated a prevalence rate of 9.8% (n=2929) and 11.3% (n=2154) respectively. The Cameroonian Armed Forces is estimated at 27,000 active-duty personnel (DOD Status Report, 2010). With an average HIV prevalence rate more than two times higher than the general population, there is a great need for effective HIV/AIDS prevention intervention programs targeting the military.

A study conducted in Cameroon by Tchoupo et al. (1994) found that personnel of the armed forces and police were involved in risk taking behaviors. UNAIDS conducted a study in 1999 with the Cameroonian FLO. This study revealed that extramarital sex partners included single girls, students, and commercial sex workers who were contacted in hotels and brothels. FLO members engaged in extramarital affairs particularly when they were on transfer away from their homebase. Most of the officers contracted STIs from casual encounters with women and commercial sex workers (Lester 1982; Tchoupo 1994; Akinnawo 1995). In addition, female uniformed personnel are especially vulnerable and have a higher risk of exposure to HIV/AIDS. Because women are often at a disadvantage in sexual negotiations, including negotiations for condom use (UNAIDS 1998; UNFPA 2002; UNICEF 2004; UNFPA 2008).

## **2.7 HIV/AIDS POLICIES IN THE CAMEROON MILITARY**

The government of Cameroon was a signatory to the International Conference on Population and Development, committing itself to implementing programs to reduce the rising incidence of STIs and HIV/AIDS. This commitment is expressed in its health sector policy, which is mandated through five fundamental principles (Doh 2001). The principles stipulate maintenance of state commitment to guarantee health as a fundamental right of each citizen and the right of all individuals to individually or collectively participate in solving health problems. Furthermore, it is the duty of the state to promote solidarity, equity and social justice, respect the right to information, and recognize the integrity of the individual including freedom to decide on health matters. The final principle highlights respect of commitments made by the state to the international community to promote the health of its citizens (Health Policy Document Cameroon 1992).

Therefore the Cameroon Ministry of Defense (MINDEF), in its prevention and research activities and as a partner of the National AIDS Control Program (NACP), seeks to improve the reproductive health of its personnel through various collaborations with national and international partners. The goal is to document changes in the HIV seroprevalence rate and sexual behavioral characteristics of military personnel. Assessing these changes will help to effectively design an intervention program to reduce the incidence of STIs/HIV infection in this population.

In particular, MINDEF has instituted various STI/HIV control and prevention activities through educational programs and systematic screenings for soldiers. The educational programs include peer education, mass communications, and lectures on STIs/HIV delivered on military bases. It has established HIV/AIDS care and treatment facilities to aid military personnel

infected with HIV. MINDEF has been heavily involved in STI/HIV research through the creation of the Military Health Research Center (CRESAR) in 2002. In addition, it has signed a ministerial note, which places priority on STI/HIV/AIDS training for new recruits and inclusion of bimonthly STI/HIV/AIDS sensitizations for military personnel.

### **3.0 METHODOLOGY**

The Global Viral Forecasting Initiative (GVFI) is a global system designed to monitor and prevent infectious disease pandemics. The mission of GVFI is to provide basic insight into how new diseases emerge and how to improve the ability to decrease the frequency. In order to control the spread of HIV/AIDS, GVFI researches new prevention technologies and effective treatments, and works towards improving current approaches of infectious disease surveillance. The US Department of Defense, through the Division of HIV/AIDS Prevention Program (DHAPP), has been collaborating with the Johns Hopkins University Center for Immunization Research-Global Viral Forecasting Initiative (JHUCIR-GVFI) since 2002 to provide assistance to militaries in central Africa in order to increase HIV/AIDS prevention for the troops. In Cameroon this collaboration has contributed to HIV seroprevalence studies (2002 and 2005), training of more than 600 peer-educators and 200 counselors, production and distribution of more than 30,000 educational materials, and the establishment of Volunteer, Counseling, and Testing centers (VCT). Funding has been approved by DHAPP to allow GVFI-Cameroon to continue this work in Cameroon.

The response to targeting and monitoring HIV in the military in Cameroon began in 1990 but was interrupted due to lack of sustainability and funding. Based on military data alone it is evident that there is a need for an effective intervention prevention program targeting military personnel. Surveillance systems that integrate epidemiological and behavioral data are required

to accurately monitor HIV in high risk groups. It is necessary to monitor the progression of this infection in the military since the majority of soldiers will return to civilian life after their tour of duty. They represent a bridging group for the transmission of STIs including HIV to spouses and sexual partners.

Results from the 2005 study demonstrate that although the majority of military personnel had heard about HIV (98.1%) and STIs (97.8%), only 14.8% and 9.5% were able to recognize a symptom of an STI on a male and female respectively. Only 56.2% of respondents knew that STIs can increase the risk of transmitting HIV and 32.7% thought that HIV is curable (GVFI Final Report 2005).

The aim of the current surveillance is to monitor the progression of HIV infection in the Cameroon military four years following the previous study, conducted in 2005, and to evaluate whether or not there has been a positive impact on the target population as a result of the intervention program currently implemented by the military.

### **3.1 RESEARCH QUESTIONS**

The objectives of this study are to analyze baseline condom use data collected from an HIV surveillance and behavioral study of the Armed Forces of Cameroon conducted by GVFI in 2005 (see Appendix A). This study was approved for exempt status by the Institutional Review Board at the University of Pittsburgh on April 23, 2009, IRB# PRO09020471 (See Appendix B).

Determining an association between condom use and socio-demographic variables can assist GVFI and MINDEF in the development of a specialized, specific intervention prevention

program for its current (2009/2010) HIV/AIDS surveillance and intervention plan targeting military personnel in Cameroon. The results of this research can be effectively utilized to improve current prevention strategies and interventions by targeting sub-populations within the military that do not consistently use condoms.

This study asked the following research questions:

1) is there a relationship between condom use with regular sex partners and military region, age, gender, marital status, military rank, and religion;

2) is there a relationship between condom use in the past six months and military region, age, gender, marital status, military rank, and religion;

3) is there a significant difference within each socio-demographic variable and condom use with regular sex partners;

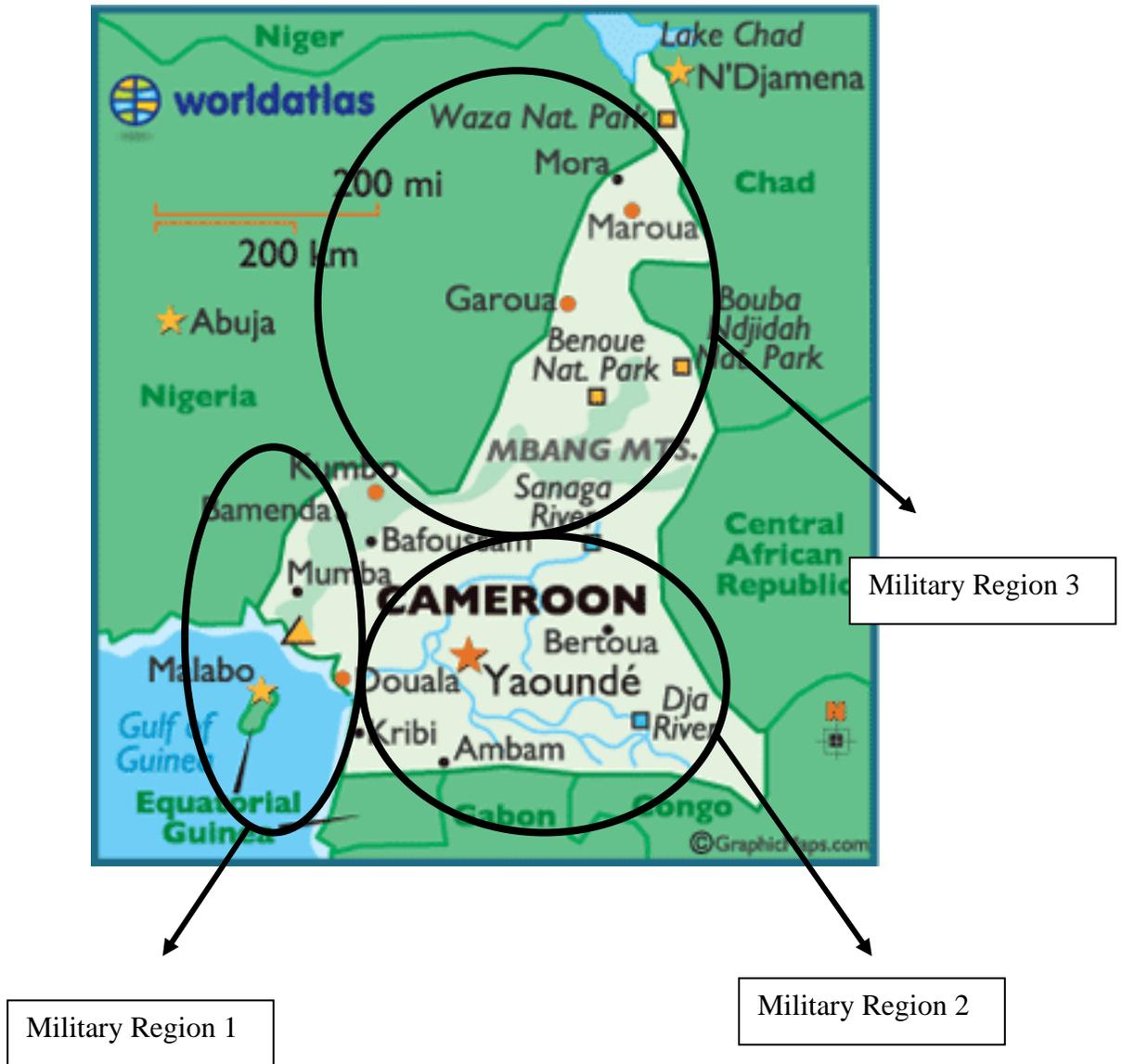
4) is there a significant difference within each socio-demographic variable and condom use in the past six months;

5) if there is significance, are there any particular socio-demographic sub-variables that are determining the statistical significance in regards to the effects of the other variables and condom use.

## **3.2 DATA**

The 2005 surveillance study included coded quantitative anonymous behavioral questionnaires associated with blood sample collections. Qualitative data were collected through focus group discussions and in-depth interviews. The surveillance was conducted in all three military regions of the country. See Figure 1 below. Data were collected from the following garrison sites:

Bertoua, Buea, Douala, Ebolowa, Koutaba, Yaounde, Ngaoundere, Garoua, Maroua, Bamenda, Bafoussam and their sub units.



**Figure 1.** Regional military map of Cameroon

(Map of Cameroon, free clipart from World Atlas  
<http://www.worldatlas.com/webimage/countrys/africa/cm.htm>, accessed April 2010)

The study sites were chosen using the following criteria: 1) heterogeneous population in terms of rank, 2) availability and accessibility of the different Forces of Law and Order (FLO), 3) prospective HIV voluntary screening sites, and 4) geographical representation. The study population included individuals from all sectors of the military (police, land force, air force, navy, fire fighters, and presidential guards).

A proportionate probability sampling technique of the companies of each corps in every military region was employed to select from the different units of the FLO. The sample was drawn from the regions and corps according to their representation in terms of the total national population. All military regions and sectors were included in the surveillance. A company (100 subjects) is the basic unit from which the samples were drawn. The companies were chosen using a random number table; therefore all companies had an equal chance of being selected for the surveillance. The samples were selected from a list of companies from each military region. Subjects were selected through systematic random sampling. Participation in the surveillance was voluntary following consent from the interviewee. Quantitative and qualitative data were collected on 2,154 individuals throughout Cameroon during the 2005 HIV surveillance. For this study, secondary analysis was performed with permission from GVFI on data taken from the 2005 HIV surveillance.

### **3.3 VARIABLES**

The following dependent socio-demographic variables were selected to be utilized in the study: military region, age, gender, marital status, military rank, and religion (see Table 1 for socio-

demographic characteristics of respondents). Military region comprised of three regions: Region 1=central, south, and east; Region 2=Littoral, southwest, northwest, and west; Region 3=north, far north, and Adamaoua. Individuals were divided into four different age groups: 17-24, 25-34, 35-44, and 45-59. The ages were divided into this manner due to the general military rankings of the Cameroon armed forces. Younger individuals are more likely to be rank and file soldiers, personnel in their twenties and thirties are more likely to be non-commissioned officers, and older individuals officers. Marital status was separated into six categories: single individuals, monogamous married, polygamous married, divorced, separated, and widowed. Military rank was divided into three categories: officers, non-commissioned officers, and rank and file soldiers. Religion was separated into four groups: Christian, Muslim, Animist, and other.

Using a binary response mode, respondents were asked if they used condoms with their regular sex partners. They were also asked if they used condoms in the past six months. Both independent variables were assessed by positive responses to condom use.

**Table 1.** Socio-demographic characteristics of respondents

Variable	Frequency N=2154	Percent of respondents
<b>Military Region</b>		
1	920	42.80%
2	818	38.10%
3	410	19.10%
<b>Age Group</b>		
17-24	192	8.91%
25-34	776	36.03%
35-44	740	34.35%
45-59	406	18.85%
<b>Gender</b>		
Male	2034	94.40%
Female	84	3.90%
<b>Rank</b>		
Rank and File	909	42.20%
Non-Comm. Officer	1023	47.50%
Officer	171	7.90%
<b>Marital Status</b>		
Single	381	17.70%
Monogamous	1450	67.30%
Polygamous	264	12.30%
Separated/divorced/widowed	24	1.10%
<b>Religion</b>		
Christian	1889	87.70%
Muslim	194	9.00%
Animist	20	0.90%
Other	16	0.70%

### 3.4 ANALYSIS

Estimated population proportions of condom use were compared within each of the following socio-demographic dependent variables: military region, age of individual, gender, marital status, military rank, and religion (see Table 1 for socio-demographic characteristics of respondents). Error ranges were attached to each sub-group in order to compare the frequency of positive condom use among the different variables. Chi-square analyses were utilized to test for significance within each socio-demographic dependent variable and condom use. Multivariate logistical regressions were executed based on the significant findings of the chi-square tests to assess the significance of a socio-demographic sub-variable in regards to the effects of all variables and condom use. Statistical analyses were performed using SYSTAT 13 and SAS 9.2. These results will be utilized to provide data and information to GVFI and MINDEF aimed at improving intervention programs for the prevention of STIs and HIV/AIDS in this population.

## **4.0 RESULTS**

### **4.1 DESCRIPTIVE STATISTICS**

A total of 2118 study participants responded to the two condom use questions; using a condom with regular sex partners and using a condom within the last six months. All participants were serving in one of three regions: Region 1 (n=920), Region 2 (n=818), and Region 3 (n=410). The participants' ages ranged from 17-59. The majority of respondents were male (94.4%), nearly half were non-commissioned officers (47.5%), 18% reported single marital status, and a majority of the participants were Christian (87.7%).

### **4.2 CONDOM USE WITH REGULAR SEX PARTNERS**

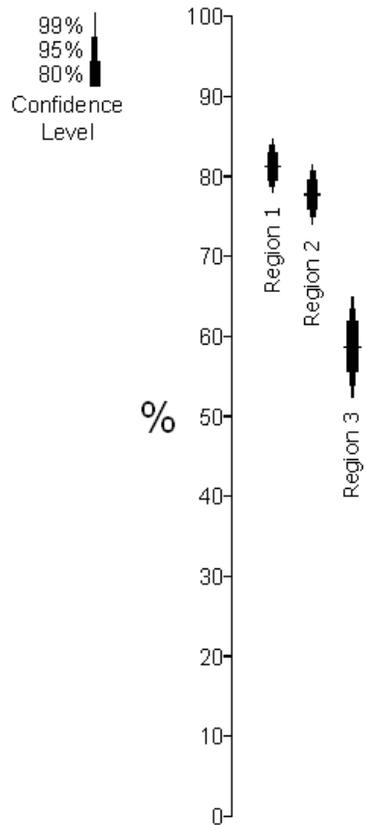
The following results are based on reporting individuals who responded affirmatively to using condoms with their regular sex partners (see Table 2 for numbers and percentages).

**Table 2. Percent of participants responding affirmatively to condom use with regular sex partners**

	<b>Region 1</b>	<b>Region 2</b>	<b>Region 3</b>			
YES	729	629	240			
NO	168	180	169			
% of pop	81.27%	77.75%	58.68%			
	<b>17-24 yrs</b>	<b>25-34 yrs</b>	<b>35-44 yrs</b>	<b>45-59 yrs</b>		
YES	169	658	529	241		
NO	22	118	211	165		
% of pop	88.48%	84.79%	71.49%	59.36%		
	<b>Male</b>	<b>Female</b>				
YES	1529	33				
NO	500	51				
% of pop	75.36%	39.29%				
	<b>Single</b>	<b>Mono</b>	<b>Poly</b>	<b>Divorced</b>	<b>Separated</b>	<b>Widowed</b>
YES	334	1087	160	6	4	9
NO	47	361	104	1	1	3
% of pop	87.66%	75.10%	60.60%	85.71%	80%	75%
	<b>Officers</b>	<b>NC Officers</b>	<b>Rank/File</b>			
YES	132	701	753			
NO	39	319	154			
% of pop	77.19%	68.73%	83.02%			
	<b>Christian</b>	<b>Muslim</b>	<b>Animist</b>	<b>Other</b>		
YES	1439	134	14	10		
NO	446	60	6	5		
% of pop	76.34%	69.07%	70%	66.67%		

Regional results from the questionnaires demonstrate a difference across the three regions. Of reporting individuals from Military Region 1 (n=897 reporting), Military Region 2 (n=809), and Military Region 3 (n=409), 81.27%, 77.75%, and 58.68% respectively responded affirmatively to using condoms with their regular sex partners. There is more than 99% confidence that

Region 3 has a lower proportion of positive responses to condom use compared to Region 1 and 2 as evidenced by no overlapping error ranges (see Figure 2).



**Figure 2.** Positive response to condom use with regular sex partners by military region

Chi-square analysis demonstrates a significant difference between the three regions regarding condom use with regular sex partners ( $\chi^2=15.38$ ,  $p<0.0005$ ).

Individuals were divided into four different age groups: 17-24, 25-34, 35-44, and 45-59. The younger age groups more frequently responded affirmatively to using a condom with their regular sex partners than did the older age groups. For example, 88.48% of reporting personnel aged 17-24 (n=191 reporting) responded affirmatively to using condoms with their regular sex partners. Of reporting individuals aged 25-34 (n=776), 84.79% responded affirmatively, for

individuals aged 35-44 (n=740), 71.49% responded affirmatively, and for individuals in the oldest aged group 45-59 (n=406), only 59.36% responded affirmatively to using condoms with their regular sex partners (refer to Table 2). There is more than 99% confidence that there are a higher proportion of younger individuals reporting condom use compared to the older age groups (see Appendix C for population proportion graph). A chi-square test reveals that there are significant differences between the age groups in regards to reported condom use with regular sex partners ( $\chi^2=29.07$ ,  $p<0.0005$ ).

These results show that women in the armed forces are less likely to report using condoms with their regular sex partners than men. Only 39.29% of responding women (n=84 reporting) answered affirmatively to the condom use question compared to 75.36% of responding men (n=2029). Refer to Table 2. The population proportion demonstrates with more than 99% confidence that there is a difference between male and female reported condom use in the Cameroon military (see Appendix C for population proportion graph). A chi-square test also shows a significant difference between male and female condom use with regular sex partners ( $\chi^2=26.8$ ,  $p<0.0005$ ).

Marital status was divided into six categories: single, monogamous married, polygamous married, divorced, separated, and widowed. Of reporting single individuals 87.66% responded affirmatively (n=381 reporting) to using condoms with their regular sex partners. Reporting individuals in a monogamous married relationship (n=1448) responded affirmatively 75.1% of the time while those in polygamous married relationships (n=264) responded affirmatively 60.6% of the time. Of reporting divorced individuals (n=7) 85.71% responded affirmatively, 80% of separated individuals (n=5) responded affirmatively, and 75% of widowed individuals (n=12) responded affirmatively to using condoms with their regular sex partners (refer to Table

2). There are differences between the marital groups; however, it is not possible to discuss with any amount of confidence the differences between the divorced, separated, and widowed sub-groups. Since the sample size is small for these three sub-populations the error ranges are very large. It is possible to speak with more than 99% confidence that there is a difference between the single and married (both monogamous and polygamous) sub-groups as evidenced by no overlapping error ranges (see Appendix C for population proportion graph). A chi-square test demonstrates a significant difference between the marital sub-populations with regards to condom use and regular sex partners ( $\chi^2=27.19$ ,  $p<0.0005$ ).

Rank and file soldiers are generally in the youngest age group and were most likely to respond affirmatively to using condoms with their regular sex partners. Of reporting personnel, 83.02% of rank and file soldiers (n=907 reporting), 68.73% of non-commissioned officers (n=1020), and 77.19% of officers (n=171) responded affirmatively to using condoms (refer to Table 2). The population proportion demonstrates with 95% confidence that there is a difference between officers and non-commissioned officers regarding a positive response to condom use. It is possible to speak with more than 99% confidence that there is a difference between rank and file soldiers and non-commissioned officers but less than 80% confidence that there is a difference between rank and file soldiers and officers (see Appendix C for population proportion graph). A chi-square test shows that there is a significant difference between the different military ranks in the Cameroon military and their reported use of condoms with regular sex partners ( $\chi^2=6.54$ ,  $p=0.038$ ).

Religion was divided into four categories: Christian, Muslim, Animist, or other. Of reporting Christians (n=1885 reporting), 76.34% responded affirmatively to using condoms with their regular sex partners. Of reporting Muslims (n=194), 69.07 % responded affirmatively,

reporting Animist (n=20) 70% responded affirmatively, and 66.67% of those practicing another religion (n=15) responded affirmatively to using condoms (refer to Table 2). It is not possible to speak with any confidence regarding differences between the religious groups and condom use with regular sex partners (see Appendix C for population proportion graph). Chi-square analysis shows that there is no significance between the different religious groups and condom use ( $\chi^2=2.612$ ,  $p=0.455$ ).

#### **4.2.1 Multivariate logistical regression regarding condom use with regular sex partners**

Multivariate logistical regression shows a significant difference between reported condom use with regular sex partners by individuals from Regions 1 and 2 with individuals from Region 3. Individuals from Region 3 were more than two times less likely to report using condoms than Region 1 (OR=2.826, CI=2.146-3.720\*\*\*) or Region 2 (OR=2.334, CI=1.777-3.65\*\*\*). Refer to Table 3 for multivariate results.

Multivariate analysis demonstrates that personnel in the oldest age group (45-59) are more than four times less likely to report using condoms than those in the youngest age group (17-24), more than three times less likely to report using condoms than those aged 25-34, and more than one and a half times less likely to report using condoms with their regular sex partners than individuals aged 35-44. There is a significant difference between personnel in the oldest age group and all other age groups (refer to Table 3).

Multivariate logistical regression reveal that there is no significant difference between the genders although females are half as likely to report using condoms with their regular sex partners than male military personnel (see Table 3). This analysis contradicts the chi-square analysis.

Multivariate analysis shows no significant difference between the marital groups and single individuals, although married individuals (monogamous and polygamous) are half as less likely to report using condoms than single individuals (refer to Table 3). This analysis contradicts the chi-square analysis.

Multivariate regression demonstrates a significant difference between officers and non-commissioned officers reporting condom use with their regular sex partners. Non-commissioned officers are more than one and half times less likely to report condom use than officers (OR=1.665, CI=1.117-2.482\*). Also the findings show no difference between rank and file personnel and non-commissioned officers (OR=1.011, CI=0.731-1.397). Refer to Table 3.

Multivariate logistical regression reveals no significant difference between Christians reporting condom use with regular sex partners and other religious groups. Other religious groups were half as less likely to report condom use than Christians (refer to Table 3).

**Table 3.** Multivariate logistical regression regarding condom use with regular sex partners

<b>Socio-Dem factor</b>	<b>Odds Ratio</b>	<b>Confidence Limit 95%</b>
Region 1	2.826	2.146-3.720***
Region 2	2.334	1.777-3.065***
Age 17-24	4.467	2.360-8.453***
Age 25-34	3.097	2.117-4.530***
Age 35-44	1.559	1.195-2.035***
Gender	0.719	0.400-1.293
Mono married	0.7	0.472-1.039
Poly married	0.515	0.317-0.839**
Other martial status	1.145	0.384-3.414
Rank and File	1.011	0.731-1.397
Officers	1.665	1.117-2.482*
Muslim	0.818	0.573-1.168
Other religions	0.658	0.313-1.383

Likelihood ratio ( $\chi^2=209.29$ ,  $p<0.0001$ )

### 4.3 POSITIVE RESPONSE TO CONDOM USE IN THE PAST SIX MONTHS

The following results are based on reporting individuals responding affirmatively to condom use in the past six months (see Table 4 for numbers and percentages).

**Table 4.** Percent of participants responding affirmatively to condom use in the past six months

	<b>Region 1</b>	<b>Region 2</b>	<b>Region 3</b>			
YES	590	469	196			
NO	306	341	213			
% of pop	65.85%	57.90%	47.92%			
	<b>17-24 yrs</b>	<b>25-34 yrs</b>	<b>35-44 yrs</b>	<b>45-59 yrs</b>		
YES	142	530	407	530		
NO	50	246	332	246		
% of pop	73.96%	68.30%	73.96%	68.30%		
	<b>Male</b>	<b>Female</b>				
YES	1204	50				
NO	825	34				
% of pop	59.35%	59.52%				
	<b>Single</b>	<b>Mono</b>	<b>Poly</b>	<b>Divorced</b>	<b>Separated</b>	<b>Widowed</b>
YES	292	825	123	5	4	5
NO	89	620	141	2	1	6
% of pop	76.64%	57.09%	46.59%	71.43%	80%	45%
	<b>Officers</b>	<b>NC Officers</b>	<b>Rank/File</b>			
YES	118	523	606			
NO	53	496	302			
% of pop	70.24%	51.32%	66.74%			
	<b>Christian</b>	<b>Muslim</b>	<b>Animist</b>	<b>Other</b>		
YES	1138	101	7	9		
NO	747	93	13	6		
% of pop	60.37%	52.06%	33%	60%		

Similar to reported condom use with regular sex partners, reported condom use in the past six months demonstrated regional differences. Of reporting individuals from Military Region 1 (n=896 reporting), Military Region 2 (n=810), and Military Region 3 (n=409), 65.85%, 57.90%, and 47.92% respectively responded affirmatively to using condoms within the past six months (see Table 4). The population proportion shows that there is a difference with 95% confidence between the three military region sub-populations and reported condom use within the past six months. Individuals from Regions 1 and 2 report more condom use than those from Region 3 (refer to Appendix C for population proportion graph). The chi-square test demonstrates that there is a significant difference between the three regions ( $\chi^2=6.7$ ,  $p=0.035$ ).

Similar to the previous question, the youngest age group 17-24 (n=192 reporting) had the highest percentage (73.96%) of reported condom use in the past six months compared to the other age groups. Of reporting individuals aged 25-34 (n=776), 68.3%% responded affirmatively, individuals aged 35-44 (n=739), 55.07% responded affirmatively, and individuals in the oldest aged group 45-59 (n=406), 43.45% responded affirmatively to using condoms within the past six months (refer to Table 4). There is a difference in reported condom use in the past six months with 99% confidence between the youngest age groups and the oldest age groups. Again, the youngest age groups are more likely report condom use (see Appendix C for population proportion graph). A chi-square test reveals that there is a significant difference between the sub-populations of the different age groups and reported condom use in the past six months ( $\chi^2=23.08$ ,  $p<0.0005$ ).

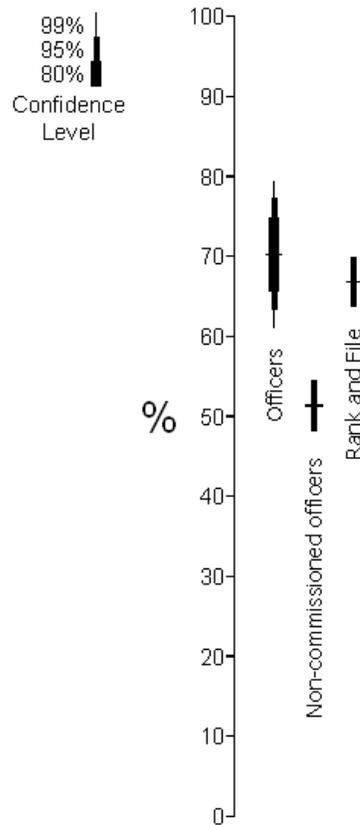
Male and female military personnel showed similar results relating to reported condom use in the past six months. Men reported (n=2029 responding) 57.09% condom use while women (n=84) reported 59.32% (refer to Table 4). It is not possible to speak with any amount of

confidence that there are differences in condom use in the past six months between male and female military personnel (see Appendix C for population proportion graph). A chi-square test also demonstrates that there is no significant difference between the males and females responding yes to using condoms in the past six months ( $\chi^2=0.00$ ,  $p=1.0$ ).

Single individuals (n=381 responding) reported the highest percentage of condom use in the past six months with a 76.64% affirmative response. Reporting individuals in a monogamous married relationship (n=1445) responded affirmatively 57.09% of the time while those in polygamous married relationships (n=264) responded affirmatively 46.59% of the time. Of reporting divorced individuals (n=7) 71.43% responded affirmatively, 80% of separated individuals (n=5) responded affirmatively, and 45.45% of widowed individuals (n=11) responded affirmatively to using condoms within the past six months (refer to Table 4). Again, due to the small sample size it is not possible to speak with any level of confidence that there are differences between divorced, separated, and widowed individuals on reported condom use in the past six months. However, there is a difference with more than 99% confidence between the single and married sub-populations regarding reported condom use in the past six months (see Appendix C for population proportion graph). A chi-square test shows that there is a significant difference between the different marital sub-populations ( $\chi^2=49.63$ ,  $p<0.0005$ ).

Interestingly, rank and file soldiers did not have the highest percentage of condom use in the past six months. Of reporting personnel, 66.74% of rank and file soldiers (n=908 reporting), 51.32% of non-commissioned officers (n=1019), and 70.24% of officers (n=168) responded affirmatively to using condoms (see Table 4). There is a difference with more than 99% confidence that non-commissioned officers reported using condoms less often than officers or

rank and file soldiers in the past six months. There is very little difference between officers and rank and file soldiers (see Figure 3).



**Figure 3.** Positive response to condom use in the past six months by military rank

A chi-square test reveals that there is significance difference between the rank sub-populations and reported condom use in the past six months ( $\chi^2=8.69$ ,  $p=0.013$ ).

Of reporting Christians (n=1885 responding), 60.37% responded affirmatively to using condoms in the past six months. Of reporting Muslims (n=194), 52.06 % responded affirmatively, reporting Animist (n=21) 33% responded affirmatively, and 60% of those

practicing another religion (n=15) responded affirmatively to using condoms (refer to table 4). Again, it is not possible to speak with any level of confidence about the differences between the different religious groups and condom use in the past six months (see Appendix C for population proportion graph). A chi-square test, however, demonstrates there to be a significant difference between the reported condom use in the past six months by the different religious groups ( $\chi^2=19.3$ ,  $p<0.0005$ ).

#### **4.3.1 Multivariate logistical regression regarding condom use in the past six months**

Multivariate logistical regression reveals a significant difference between reported condom use in the past six months by individuals from Regions 1 and 2 with individuals from Region 3. Multivariate logistical regression shows that individuals from Region 3 were almost two times less likely to report using condoms than Region 1 (OR=1.940, CI=1.507-2.497\*\*\*) or almost one and a half times less likely to report condom use than personnel from Region 2 (OR=1.403, CI=1.090-1.806\*\*). Refer to Table 5 for multivariate results.

Multivariate analysis demonstrates that personnel in the oldest age group (45-59) are almost three times less likely to report using condoms than those in the youngest age group (OR=2.983, CI=1.800-4.946\*\*\*), almost two and a half times less likely to report using condoms than those aged 25-34 (OR=2.492, CI=1.789-3.472\*\*\*), and more than one and a half times less likely to report using condoms in the past six months than individuals aged 35-44 (OR=1.594, CI=1.236-2.055\*\*\*). There is a significant difference between personnel in the oldest age group and all other age groups (refer to Table 5).

Multivariate logistical regression shows that there is a significant difference between the genders and reported condom use in the past six months. Females are half as likely to report

using condoms with their regular sex partners than male military personnel (see Table 5). This finding contradicts the chi-square analysis.

Multivariate analysis shows a significant difference between the married groups and single individuals. Married monogamous individuals were half as less likely to report condom use in the past six months than single individuals. Married polygamous individuals were almost half as less likely to report condom use than single individuals (refer to Table 5).

Multivariate regression demonstrates a significant difference between officers and non-commissioned officers reporting condom use in the past six months (OR=2.268, CI=1.581-3.254\*\*\*). Non-commissioned officers are more than two times less likely to report condom use than officers (refer to Table 5). Again, the findings showed that there is no significant difference between rank and file personnel and non-commissioned officers regarding reported condom use in the past six months (OR=0.986, CI=0.749-1.300).

Multivariate logistical regression shows no significant difference between Christians reporting condom use in the past six months and other religious groups. Other religious groups were half as less likely to report condom use than Christians (refer to Table 5). These findings contradict the chi-square analysis.

**Table 5.** Multivariate logistical regression regarding condom use in the past six months

<b>Socio-Dem factor</b>	<b>Odds Ratio</b>	<b>Confidence Limit 95%</b>
Region 1	1.94	1.507-2.497***
Region 2	1.403	1.090-1.806**
Age 17-24	2.983	1.800-4.946***
Age 25-34	2.492	1.789-3.472***
Age 35-44	1.594	1.236-2.055***
Gender	0.606	0.375-0.980*
Mono married	0.525	0.386-0.714***
Poly married	0.451	0.299-0.681***
Other martial status	0.758	0.304-1.891
Rank and File	0.986	0.749-1.300
Officers	2.268	1.581-3.254
Muslim	0.735	.0535-1.011
Other religions	0.549	0.275-1.096

Likelihood ratio ( $\chi^2=174.74$ ,  $p<0.0001$ ).

## 5.0 DISCUSSION

Patterns of socio-demographic characteristics related to condom use emerged from this research. It is evident from the data that individuals from Military Regions 1 and 2 have a much higher percentage of reported condom use than those from Military Region 3. Military Regions 1 and 2 include the most populated cities in Cameroon; Yaoundé in Region 1 is the capital city and Douala in Region 2 is the major port city and economic capital of the country. The third military region comprises more sparsely populated rural areas. In addition, results uncovered by GVFI's analysis of the 2005 study demonstrate that military personnel from Region 3 exhibit the highest HIV prevalence rate 12.9% compared to 10.7% in Region 1 and 11.3% in Region 2 (GVFI Final Report 2005), the same region in which individuals are least likely to report using condoms.

A new intervention that targets recruits from Region 3 should include HIV/AIDS peer education programs and condom use promotion as these have proven to be effective in transferring knowledge about HIV and promote change in sexual behavior (Kaczor 2002; U.S. Department of State 2006; U.S. Department of State 2007). When soldiers enter the military part of their initial training could include STI/HIV/AIDS prevention. The curriculum of these trainings should emphasize responsible sexual behavior and risks and consequences of contracting infectious diseases while on assignment. This information should be provided in a manual given to new recruits from all regions and to those undergoing further training to upgrade their military rank. In addition, there could be pre-deployment and post-deployment STI/HIV

education sessions to reinforce the importance of condom use in the prevention of sexually transmitted infectious diseases. In Senegal for example, HIV prevention education sessions are given to soldiers before each peacekeeping mission. Pre- and post-deployment HIV testing of military personnel have shown that Senegalese troops have never brought HIV home to Senegal (Lom 2001). Programs such as these could help prepare soldiers from rural and urban areas who may be lacking exposure to this form of education.

Another emergent pattern is that younger military personnel are more likely to use condoms than older individuals. It is possible that younger individuals are exposed to STI/HIV/AIDS prevention programs in school while older individuals would have already left school before these educational programs became part of Cameroon's national campaign to fight HIV/AIDS. It may also be probable that younger soldiers are reporting higher rates of condom use because they have enough education to know that they should report condom use. In addition, older individuals are more likely to be involved in committed relationships and may not think that condom use is necessary with their spouse(s) or long-time partner(s). Younger individuals may be more prone to gauge the risk of sexual encounters and therefore more likely to use condoms with casual sex partners. Young military personnel who use condoms can be trained as peer educators for educational programs designed for new and active recruits. These recommendations all need further research to determine the level of effectiveness.

With regard to age and likelihood of condom use, rank and file soldiers most commonly fall into the youngest age group. They have reported higher percentage condom use with their regular sex partners than older non-commissioned officers. They also have a lower HIV prevalence rate (9%) compared to non-commissioned officers (14%) (GVFI Final Report 2005). Younger military personnel also demonstrated a lower HIV prevalence rate in the original 2002

study (GVFI Final Report 2005). Officers reported the highest percentage of condom use in the past six months and they have lowest HIV prevalence rate (7%) (GVFI Final Report 2005). Multivariate analysis has shown that officers are more likely to report using condoms than rank and file soldiers or non-commissioned officers.

With regards to condom use in the past six months, the number of partners and frequency of sexual encounters is important information to have when assessing the level of risky sexual behavior. For example, an individual may have a higher rate of using condoms with regular sex partners but when reporting may have only seen their partner twice in the last six months. It is important, however, to assess whether individuals are using condoms at all so that a proper intervention can be created for various target populations.

Regarding marital status, younger individuals are more often single and reported the greatest percentage of condom use and the lowest percentage of HIV prevalence rate (GVFI Final Report 2005) compared with any other marital group. Married individuals, whether they were in monogamous or polygamous relationships, demonstrated the lowest percentage of condom use with their regular sex partners and a low percentage of condom use in the past six months. Again, this may be due to that fact that younger individuals have been exposed to HIV education and that they may be more likely to judge the risk of having sex without a condom. Those in committed relationships may be more likely to trust their spouses and gauge sexual encounters as low risk for contracting STIs/HIV.

Utilizing older military personnel such as higher-ranking officers as STI/HIV/AIDS trainers may help to encourage a new military culture of condom use while educating individuals of all ranks and ages. Officers have the lowest HIV prevalence rate (7%) compared to the other groups (GVFI 2005 Final Report). Non-commissioned officers significantly reported the lowest

condom use than any other group and have the highest HIV prevalence rate at 14% (GVFI 2005 Final Report). Officers must have a higher level of education and undergo more training than non-commissioned officers in Cameroon. Officers also have more influence in the military setting them apart from non-commissioned officers. Higher-ranking officers could educate non-commissioned officers in STI/HIV/AIDS prevention and train them to promote condom use.

Although reporting female personnel were much less likely to report using condoms with their regular sex partners compared to their male counterparts, they had a lower HIV prevalence rate compared to their male counterparts (GVFI Final Report 2005). The majority of individuals (94.4%) involved in the study were male. Various studies have shown that women are very vulnerable to sexually transmitted infections and are culturally at a disadvantage in condom use negotiation (UNAIDS 1998; UNFPA 2002; UNICEF 2004; UNFPA 2008). More than half (53.7%) of all HIV positive individuals in Cameroon are women (African Development Forum 2000). Specifically targeting and training female military personnel in condom negotiation skills and proper condom use (including the use of the female condom) can help women protect themselves from infectious diseases. Female peer educators have shown success in many different countries (Busayawong 1996; Cash et al., 1997; Population Council 1999; UNAIDS 1999). Therefore training female military personnel to serve as peer educators for women in the greater community could assist in providing a strong voice in sexual negotiation and condom use.

In regards to religious affiliation and condom use, Christians reported the most condom use with regular sex partners and condom use in the past six months compared to other religious groups. It would be interesting to evaluate condom use acceptance by the various religious groups in Cameroon in order to culturally tailor an intervention.

Following the 2005 HIV seroprevalence study, GVFI made recommendations to the military regarding its STI/HIV/AIDS prevention methods. The initiative encouraged the armed forces to continue STI/HIV/AIDS trainings within all units. GVFI suggested that the military review its training materials and encouraged it to include education on responsible sexual behavior as part of their military training curriculum. They recommended that the military focus on prevention activities in rural areas and that it provides funding to military infirmaries so that these facilities can offer voluntary counseling and testing services (GVFI Final Report 2005).

Between 2002 and 2008, the period following the two studies, GVFI collaborated extensively with the Cameroonian military to improve STI/HIV prevention activities for military personnel. It established six new voluntary counseling and testing centers in six cities, trained hundreds of peer educators to teach responsible sexual behavior, trained 50 counselors to assist military personnel and their families affected by HIV/AIDS, trained medical personnel to become specialist in the care of STI/HIV infected individuals, and produced and distributed more than 20,000 pieces of educational material for military personnel (GVFI Rapport d'Activites 2000-2008).

It is evident that GVFI and the military of Cameroon have taken major steps towards the prevention of STI/HIV within the military. The question remains as to what can be done to decrease the current HIV prevalence rate in the military and how can civilian populations be protected against the transmission of HIV from returning military personnel.

## 5.1 LIMITATIONS OF STUDY

The current study had several limitations. First, the data was analyzed as secondary data from a previous study conducted in 2005. Second, there are many questions that remain unanswered due to time constraints and the size of the study population, which limits the ability to analyze all data thoroughly. Data gathered from this study is rich and extensive but further analysis is needed to ascertain additional trends in HIV prevalence rates and sexual behavior characteristics of military personnel in Cameroon. Third, some participants may have reported condom use because there may be an expectation to report condom use even if they are not using condoms out of concern for negative social and professional consequences. Fourth, some sub-populations have low numbers of respondents such as women, divorced, separated, and widowed individuals, and certain religious groups. Therefore the findings may not be generalizable to these sub-populations.

## 6.0 CONCLUSION

Militaries have strong traditions of organization, discipline and strict hierarchical structures, which may serve as an advantage when designing a STI/HIV intervention program. Employing the existing structure allows leaders to influence the social norms of the military culture. Leaders should encourage soldiers to take responsibility for their own health and that of others. Military leaders could also foster a more positive attitude regarding the civilian populations in which they work by placing emphasis on protection, communication, and compassion towards the local population (UNAIDS 1998). In addition, these changes would allow for the transfer of consistent, accurate STI/HIV prevention and transmission information to soldiers (Bing et al. 2005).

Successful military intervention programs require a multidisciplinary collaboration involving the government, military authorities, non-governmental organizations, the health care system, and the community. Nwokoji and Ajuwon (2004) suggest a sustained education program that utilizes various media, presentation of statistics regarding military personnel affected by HIV/AIDS, aggressive promotion of condom use by military/government officials, and discouragement of long-term and frequent deployments in order to encourage the integrity of the family. In addition to these, an UNAIDS report (1998) suggests expanding the level of treatment for STIs, providing counseling, encouraging voluntary testing, and creating a non-stigmatizing environment within the military for the soldiers that are HIV positive.

The Cameroon military, with an average HIV prevalence rate more than two times higher than the general population, has a great need for effective STI/HIV/AIDS prevention intervention programs. This research has shown trends that certain socio-demographic characteristics report lower rates of condom use including military personnel from Region 3, older age, women, married individuals, non-commissioned officers, and non-Christians. This information can be utilized for the new HIV/AIDS intervention prevention plan (2009/2010) targeting the military in Cameroon.

The majority of soldiers will return to civilian life after their tour of duty. Most military personnel interact freely with civilian populations while they are serving. They represent a bridging group for the transmission of STIs/HIV into the general population. In the design phase of new military HIV/AIDS prevention programs for Cameroon, socio-demographic factors associated to condom use should be taken into account to help make the interventions more effective. The hierarchical structure of the military and the captive audience of military personnel provide an excellent opportunity to implement intervention programs. Training of trainers programs for higher-ranking officers and peer-educator programs targeting specific populations within the military has the potential to decrease the current STI/HIV incidence rate (an objective of the surveillance study). In addition, a multidisciplinary and multi-dimensional approach that focuses on intensive education at all levels and outreach that includes condom distribution and counseling and testing services is essential in creating the most effective HIV/AIDS prevention intervention program targeted military personnel.

## **6.1 IMPLICATIONS FOR MILITARY POLICY IN CAMEROON**

Consistent and proper condom use is a highly effective method for decreasing new STI/HIV infections. In the design phase of a new intervention, groups that reported lower condom use should be considered so that the education material that is utilized can be culturally sensitive and tailored for specific sub-populations within the military. Military trainers and peer educators should be aware of these factors as they continue to teach sessions in all military units throughout Cameroon. Trends in condom use may change over time. Therefore analysis should be done each time a new STI/HIV surveillance is conducted for the military.

In Cameroon since there is a high level of respect towards higher ranking officers, training older higher-ranking officers and non-commissioned officers to give STI/HIV education sessions to their units may be an effective method encouraging a new military culture of condom use. It would also be a way to ensure that accurate and consistent information regarding condom use is disseminated among the ranks.

The Ministry of Defense in Cameroon should continue collaborating with GVFI and provide support for new STI/HIV/AIDS prevention activities in the military. STI/HIV prevention sessions should be organized and delivered monthly on every base throughout the country. STI/HIV/AIDS education should be part of normal military training including aggressive condom use promotion.

**APPENDIX A**

**SURVEY USED IN THE 2005 MILITARY SURVEILLANCE**

—SYNTHESE DES TRAVAUX DE REVUE DU PROTOCOLE DE L'ENQUETE  
**HIV Surveillance in the Cameroon Military**

Après la prise de contact, six séances de travail ont eu lieu au CRESAR pour finaliser les documents du projet. Les points examinés ont essentiellement portés sur :

- La méthodologie de sondage et l'échantillonnage
- le questionnaire
- la méthodologie de l'interview
- les éléments de coûts

S'agissant du premier point : il a été retenu que l'enquête se fera par sondage à deux degrés. Le premier degré consistera à choisir les unités dans les régions militaires. Pour cela 120 unités seront tirées sur un ensemble d'environ 310 unités. Une fois l'unité tirée, l'on procédera au second degré à la sélection au hasard de 30 à 40 personnes par unité. Pour ce qui est de la taille de l'échantillon, celle-ci a été révisée à la hausse pour tenir compte des besoins d'analyse. En fait l'échantillon minimal d'ensemble a été estimé à 3127 individus, mais si l'on veut avoir des indicateurs par corps et par région militaire, la taille de l'échantillon est de 5150 individus. Les éléments de base utilisés sont issus de l'étude de 2002, notamment la prévalence VIH estimée dans les corps et les régions militaires. Les autres éléments méthodologiques n'ont pas été amendés car conformes à la philosophie générale de l'étude.

Le questionnaire a été amendé et finalisé tant dans sa forme que dans son contenu. De manière générale, sa présentation permet un remplissage aisé et une navigation directionnelle en fonction des réponses des enquêtés.

En ce qui concerne la méthode de l'interview, il a été retenu que le remplissage des questionnaire se fera par interview directe et non par l'auto-dénombrement ( tel que cela a été fait lors de l'enquête de 2002) au regard de certaines questions retenues dans le questionnaire. Pour cela il faudra former une trentaine d'agents enquêteurs qui devront administrer le questionnaire aux personnes échantillonnées. Les enquêteurs recrutés au sein des Forces Armées subiront une formation de cinq jours ( trois jours en salle et deux jours de pratiques).

Au regard de modifications apportées dans la taille de l'échantillon et sur la procédure de collecte des données, des coûts additionnels au budget actuel sont nécessaires et portent essentiellement sur la formation, la supervision, le perdiem, le transport et le matériel. Ils sont environ estimés à 25 000 000 Fcfa.

**I-DONNEES SOCIO-DEMOGRAPHIQUES**

N°	Libellé (Questions /Instructions)	Modalités (Réponses/codes)	Passez A
101	En quel jour, mois et année êtes-vous né ?	JOUR...../ / / MOIS...../ / / ANNEE...../ / / / /	
102	Sexe de l'enquêté ENCERCLER LE CODE CORRESPONDANT	HOMME.....1 FEMME.....2	
103	Quel est votre statut matrimonial ?  ENCERCLER LE CODE CORRESPONDANT	CELIBATAIRE.....1 MARIE MONOG.....2 MARIE POLYG.....3 DIVORCE(E).....4 SEPRE(E).....5 VEUF(VE).....6	
104	Combien d'enfants vivent avec vous en permanence ?	NOMBRE D'ENFANTS / / /	
105	Quel est votre grade ?	OFFICIER .....1 SOUS-OFFICIER.....2 HOMME DE RANG.....3	
106	Quel est votre unité	UNITE / / / /	
107	Quel est votre corps ?  ENCERCLER LE CODE CORRESPONDANT	GENDARMERIE.....1 ARMEE DE TERRE.....2 MARINE.....3 ARMEE DE L'AIR.....4 SAPEUR POMPIER .....5 GARDE PRESIDENT .....6	
108	Quelle est votre religion ?	CHRETIEN.....1 MUSULMAN.....2 ANIMISTE.....3 AUTRE.....4	
109	Depuis combien d'années êtes-vous en service ?	NOMBRE D'ANNEES / / /	

II- CONNAISSANCE DES INFECTIONS SEXUELLEMENT TRANSMISSIBLES																														
N°	Libellé (Questions /Instructions)	Modalités (Réponses/codes)	Passez A																											
201	Avez-vous déjà entendu parler d'une infection sexuellement transmissible (IST) ?	OUI.....1 NON.....2 →	Q203																											
202	Pouvez-vous citer au moins deux IST que vous connaissez ?  NE SUGGERER PAS DE REPONSE	<table border="1"> <thead> <tr> <th></th> <th>OUI</th> <th>NON</th> </tr> </thead> <tbody> <tr><td>CHAUDE PISSE</td><td>1</td><td>2</td></tr> <tr><td>SYPHILIS</td><td>1</td><td>2</td></tr> <tr><td>GONOCOCCIE</td><td>1</td><td>2</td></tr> <tr><td>CHLAMIDIAE</td><td>1</td><td>2</td></tr> <tr><td>CHANCRE MOU</td><td>1</td><td>2</td></tr> <tr><td>HERPES GENITAL</td><td>1</td><td>2</td></tr> <tr><td>CANDIDOSE</td><td>1</td><td>2</td></tr> <tr><td>TRICHOMONAS</td><td>1</td><td>2</td></tr> </tbody> </table>		OUI	NON	CHAUDE PISSE	1	2	SYPHILIS	1	2	GONOCOCCIE	1	2	CHLAMIDIAE	1	2	CHANCRE MOU	1	2	HERPES GENITAL	1	2	CANDIDOSE	1	2	TRICHOMONAS	1	2	
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TRICHOMONAS	1	2																												
203	Que représente cette photographie N°1	<table border="1"> <thead> <tr> <th></th> <th>OUI</th> <th>NON</th> </tr> </thead> <tbody> <tr><td>SEXE DE L'HOMME</td><td>1</td><td>2</td></tr> <tr><td>CHAUDE PISSE</td><td>1</td><td>2</td></tr> <tr><td>IST</td><td>1</td><td>2</td></tr> <tr><td>GONOCOCCIE</td><td>1</td><td>2</td></tr> <tr><td>INFECTION A CHLAMIDIAE</td><td>1</td><td>2</td></tr> <tr><td>SYPHILIS</td><td>1</td><td>2</td></tr> <tr><td>TRICOMONASE</td><td>1</td><td>2</td></tr> <tr><td>AUTRE</td><td>1</td><td>2</td></tr> </tbody> </table>		OUI	NON	SEXE DE L'HOMME	1	2	CHAUDE PISSE	1	2	IST	1	2	GONOCOCCIE	1	2	INFECTION A CHLAMIDIAE	1	2	SYPHILIS	1	2	TRICOMONASE	1	2	AUTRE	1	2	
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AUTRE	1	2																												

### III- CONNAISSANCE DU VIH /SIDA

N°	Libellé (Questions /Instructions)	Modalités (Réponses/codes)	Passez A	
301	Avez-vous déjà entendu parler du VIH/SIDA	OUI.....1 NON.....2 →	Q401	
302	Comment se transmet le VIH ?	A- RAPPORTS SEXUELS	OUI.....1 NON.....2 →	
		COMMENT ?	OUI   NON	
		HOMME A FEMME	1   2	
		HOMME A HOMME	1   2	
		FEMME A FEMME	1   2	
		B- D'UNE MERE A SON ENFANT	OUI.....1 NON.....2	
302D	C- PAR LE SANG	OUI.....1 NON.....2 →	Q302D	
		COMMENT ?		OUI   NON
		TRANSF. ANGUINE		1   2
		BLESSURE OBJETS TRANCHANTS SOUILLES		1   2
303	Le SIDA ou l'infection à VIH est-il guérissable aujourd'hui ?	OUI.....1 NON.....2 →	Q305	
		304		Comment peut-on guérir le SIDA ou l'infection à VIH ?
305	Existe t-il une (des) relation (s) entre les IST et le VIH/SIDA	OUI.....1 NON.....2 →	Q401	
306	La quelle ? ( lesquelles ?)	FAVORISENT.....1 AGGRAVENT.....2 AUTRE.....3		

IV- ATTITUDES VIS-A-VIS DE LA SEROLOGIE VIH				
N°	Libellé (Questions /Instructions)	Modalités (Réponses/codes)	Passez A	
401	Avez-vous déjà eu à subir un test de dépistage du VIH ?	OUI.....1 NON.....2 →	Q406	
402	Dans quelle circonstance avez-vous subi le dernier (ce) test ?	DON DE SANG.....1 DIAGNOSTIC.....2 DEPISTAGE VOLONTAIRE.....3 OBLIGATION.....4 Autre.....5		
403	Quelle est la date (mois et année) de votre dernier test de dépistage de VIH	MOIS...../ / ANNEE...../ / / /		
404	Connaissez-vous votre statut sérologique VIH	OUI.....1 → NON.....2	Q408	
405	Pourquoi ne connaissez-vous pas votre statut sérologique ?	CHER/COUT ELEVE.....1 PEUR.....2 N'EST PAS CONCERNE.....3 NE SAIT PAS OU LE FAIRE...4 AUTRE.....5		
406	Souhaiteriez-vous connaître votre statut sérologique?	OUI.....1 → NON.....2 →	Q407A Q407B	
407A	Si oui pourquoi ?	PRISE EN CHARGE RAPIDE.....1 PRUDENCE/PRECAUTION.....2 INQUIET/PREOCUPE.....3 AUTRE.....4		
407B	Si non pourquoi ?	CHER/COUT ELEVE.....1 PEUR.....2 N'EST PAS CONCERNE.....3 NE SAIT PAS OU LE FAIRE...4 AUTRE.....5		
408	Pensez-vous qu'il est important aujourd'hui de faire un test de dépistage du VIH même sans être malade ?	OUI.....1 NON.....2		
409	Accepteriez-vous aujourd'hui de faire un dépistage du VIH de manière volontaire ?	OUI.....1 → NON.....2 →	Q410 Q411	
410	Si oui pourquoi ?	PRISE EN CHARGE RAPIDE.....1 PRUDENCE/PRECAUTION.....2 INQUIET/PREOCUPE.....3 AUTRE.....4		
411	Si non pourquoi ?	CHER/COUT ELEVE.....1 PEUR.....2 N'EST PAS CONCERNE.....3 NE SAIT PAS OU LE FAIRE...4 AUTRE.....5		
412	Accepteriez-vous de partager certaines commodités avec un collègue atteint du SIDA ou infecté par le VIH ?		OUI	NON
		CANTINE/POTE-POTE	1	2
		DORTOIR	1	2
		SALLE DE BAIN TOILETTES	1 1	2 2
413	Pensez-vous qu'un collègue atteint par le VIH peut être autorisé à participer aux stages ?	OUI.....1 NON.....2		

V-PREVENTION DES IST ET DU VIH/SIDA																											
N°	Libellé (Questions /Instructions)	Modalités (Réponses/codes)	Passez A																								
501	Avez-vous contracté une IST au cours des 12 derniers mois ?	OUI.....1 NON.....2 →	Q503																								
502	Où êtes-vous allé vous soigner ?	DANS UN CENTRE SANTE.....1 GUERISSEUR.....2 CONSEIL AMI.....3 AUTO MEDICATION.....4 AUTRE .....5																									
503	Comment faites vous pour éviter les IST et le VIH/SIDA  (autre chose ?)  NE PAS SUGGERER LA REPONSE	<table border="1"> <thead> <tr> <th></th> <th>OUI</th> <th>NON</th> </tr> </thead> <tbody> <tr> <td>ABSTINENCE</td> <td>1</td> <td>2</td> </tr> <tr> <td>FIDELITE</td> <td>1</td> <td>2</td> </tr> <tr> <td>UTIL. CONDOM</td> <td>1</td> <td>2</td> </tr> <tr> <td>REDUCTION NBRE PARTENAIRE</td> <td>1</td> <td>2</td> </tr> <tr> <td>EVITER PROSTITUES</td> <td>1</td> <td>2</td> </tr> <tr> <td>PRATIQUE DEPISTAGE AVEC PARTENAIRE</td> <td>1</td> <td>2</td> </tr> <tr> <td>AUTRE</td> <td>1</td> <td>2</td> </tr> </tbody> </table>		OUI	NON	ABSTINENCE	1	2	FIDELITE	1	2	UTIL. CONDOM	1	2	REDUCTION NBRE PARTENAIRE	1	2	EVITER PROSTITUES	1	2	PRATIQUE DEPISTAGE AVEC PARTENAIRE	1	2	AUTRE	1	2	
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PRATIQUE DEPISTAGE AVEC PARTENAIRE	1	2																									
AUTRE	1	2																									
504	Combien de partenaires réguliers avez-vous (depuis les 12 derniers mois) en dehors de votre époux(se) dans la ville où vous habitez ?	NOMBRE DE PARTENAIRE REGULIER  ///																									
505	Si vous avez aujourd'hui une IST, comment allez-vous vous comporter ?  (autre chose ?)  NE PAS SUGGERER LA REPONSE	<table border="1"> <thead> <tr> <th></th> <th>OUI</th> <th>NON</th> </tr> </thead> <tbody> <tr> <td>SE RENDRE FORMATION SANITAIRE</td> <td>1</td> <td>2</td> </tr> <tr> <td>ME FAIRE TRAITER AINSI QUE MES PARTENAIRE</td> <td>1</td> <td>2</td> </tr> <tr> <td>NE DIRAI PAS A MES PARTENAIRE</td> <td>1</td> <td>2</td> </tr> <tr> <td>ALLER VOIR UN AMI QUI L'AURAIT EUE</td> <td>1</td> <td>2</td> </tr> <tr> <td>ACHETER MEDICAMENT DANS LA RUE</td> <td>1</td> <td>2</td> </tr> <tr> <td>ME CONFIER A UN AMI</td> <td>1</td> <td>2</td> </tr> <tr> <td>ALLEZ CHEZ LE GUERISSEUR</td> <td>1</td> <td>2</td> </tr> </tbody> </table>		OUI	NON	SE RENDRE FORMATION SANITAIRE	1	2	ME FAIRE TRAITER AINSI QUE MES PARTENAIRE	1	2	NE DIRAI PAS A MES PARTENAIRE	1	2	ALLER VOIR UN AMI QUI L'AURAIT EUE	1	2	ACHETER MEDICAMENT DANS LA RUE	1	2	ME CONFIER A UN AMI	1	2	ALLEZ CHEZ LE GUERISSEUR	1	2	
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ACHETER MEDICAMENT DANS LA RUE	1	2																									
ME CONFIER A UN AMI	1	2																									
ALLEZ CHEZ LE GUERISSEUR	1	2																									
506	Avez-vous des copains/copines dans l'armée ?	OUI.....1 NON.....2 →	Q510																								
506A	Si oui combien ?	NOMBRE COPAINS/COPINES  ///																									
507	Résident elles/ils dans la même ville que vous ?	OUI.....1 NON.....2																									
508	Est/sont elle(s)/il(s)votre/vos partenaire(s) régulier(s) citées en ....	OUI.....1 NON.....2																									
509	Avec combien de partenaires différents (es) de l'armée avez-vous eu des rapports sexuels au cours des deux dernières années ?	NOMBRE DE PARTENAIRE DANS L'ARMEE  ///																									
510	Combien de fois en moyenne vous déplacez-vous (passez la nuit hors de votre résidence habituelle) par an	NOMBRE DE FOIS  ///																									

N°	Libellé (Questions /Instructions)	Modalités (Réponses/codes)	Passez A
511	Quelle est la durée moyenne de vos déplacements ?	DUREE MOYENNE / / / JOURS	
512	Rencontrez-vous des copains et copines pendant vos déplacements ?	OUI.....1 NON.....2	
513	Avez-vous des rapports sexuels avec des personnes de même sexe que vous ?	OUI.....1 NON.....2 → Q515	
514	Le faites-vous aussi avec des personnels de l'Armée ?	OUI.....1 NON.....2	
515	Combien de rapports sexuels occasionnels (en dehors de votre époux (se) avez-vous eus au cours des six derniers mois	NOMBRES DE RAPPORTS OCCASIONNELS / / /	
516	POUR LES FEMMES UNIQUEMENT Avec quelle régularité faites-vous des examens gynécologiques PCV ?	SEMAINES.....1 / / / MOIS.....2 / / / ANNEES.....3 / / / EN CAS DE BESOIN.....4 99	
517	Pensez-vous que courez de faibles risques ou minimes, des risques réduits, des risques importants ou pas de risques du tout de contracter le VIH ?	PAS DE RISQUES.....1 RISQUES FAIBLES.....2 RISQUES MOYENS.....3 RISQUES IMPORTANTS.....4	

VI- CONNAISSANCE ET UTILISATION DU CONDOM			
N°	Libellé (Questions /Instructions)	Modalités (Réponses/codes)	Passez A
601	Qu'est-ce que c'est ? MONTRER UN CONDOM	CONDOM.....1 AUTRE.....2	
602	Utilisez-vous des condoms avec vos (votre) partenaires réguliers (es) ?	OUI.....1 NON.....2 → Q604	
603	Si oui comment ? ENCERCLER LE CODE CORRESPONDANT	A CHAQUE RAPPORT SEXUEL (PART. REG).....1 A CERTAINS RAPPORT SEXUELS (PART. REG).....2 AVEC TOUS LES PARTENAIRES (PART OCC).....3 AVEC CERTAINS PARTENAIRES (PART OCC).....4 DE TEMPS EN TEMPS AVEC LES PART. SEXUELS.....5	
604	Pendant les six derniers mois avez-vous le condom	OUI.....1 NON.....2 → Q608	
605	Combien de fois avez-vous utilisé le condom au cours des six derniers mois ?	NOMBRE DE FOIS / / /	
606	Si oui comment ?	REGULIEREMENT (AVEC TOUS LES PARTENAIRES)....1 → Q608 SOUVENT (AVEC CERTAINS PARTENAIRES JUGES A RISQUE).....2 DE TEMPS EN TEMPS.....3	
607	Pourquoi n'utilisez-vous pas le condom régulièrement ? ENCERCLER LE CODE CORRESPONDANT	ILS COUTENT CHERS.....1 NE SONT PAS FACILES A AVOIR.....2 JE NE LES AIME PAS.....3 REDUISENT LE PLAISIR.....4	
608	FIN DE L'INTERVIEW		

## **APPENDIX B**

### **IRB APPROVAL**

From: irb+@pitt.edu  
Subject: PI Notification: IRB determination  
Date: Thu, April 23, 2009 9:16 am  
To: amn15@pitt.edu

Pitt

Seal<[https://stg.osiris.pitt.edu/osiris-dev/Doc/0/2EM15I2P60HK18BCUD0RH7EF8D/pitt\\_bluegold\\_seal10.gif](https://stg.osiris.pitt.edu/osiris-dev/Doc/0/2EM15I2P60HK18BCUD0RH7EF8D/pitt_bluegold_seal10.gif)>

University of Pittsburgh  
Institutional Review Board

3500 Fifth Avenue

Pittsburgh, PA 15213

(412) 383-1480

(412) 383-1508 (fax)

<http://www.irb.pitt.edu> <<http://www.irb.pitt.edu/>>

Memorandum

To: Anne Nagy, MA  
From: Christopher Ryan, PhD, Vice Chair  
Date: 4/23/2009  
IRB#: PRO09020471

<[https://www.osiris.pitt.edu/osiris/Rooms/DisplayPages/LayoutInitial?Container=com.webridge.entity.Entity\[OID\[1C106EF64BF7C947993988A82F230908\]\]](https://www.osiris.pitt.edu/osiris/Rooms/DisplayPages/LayoutInitial?Container=com.webridge.entity.Entity[OID[1C106EF64BF7C947993988A82F230908]])>

Subject: Evaluation of HIV/AIDS prevention program targeted for the Cameroon military

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The above-referenced project has been reviewed by the Institutional Review Board. Based on the information provided to the IRB, this project includes no involvement of human subjects, according to the federal regulations [§46.102(f)]. That is, the investigator conducting research will not obtain data through intervention or interaction with the individual, nor will obtain identifiable private information. Should that situation change, the investigator must notify the IRB immediately. Given this determination, you may begin your project.

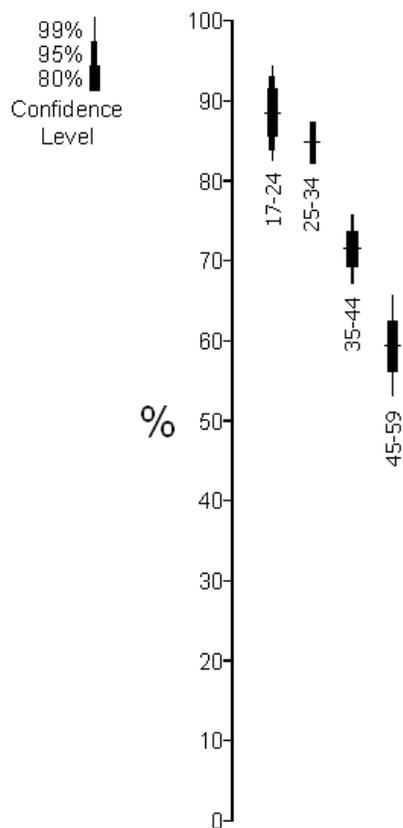
If any modifications are made to this project, please contact the IRB Office to ensure it continues to meet the no human subjects determination.

Upon completion of your project, be sure to finalize the project by submitting a termination request.

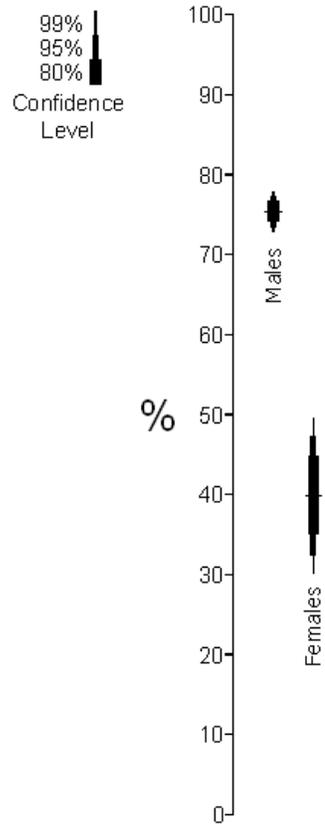
Please be advised that your research study may be audited periodically by the University of Pittsburgh Research Conduct and Compliance Office.

## APPENDIX C

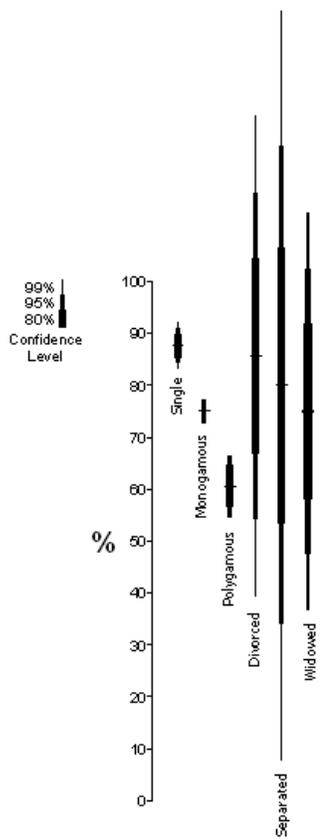
### POPULATION PROPORTION GRAPHS FOR CONDOM USE WITH REGULAR SEX PARTNERS



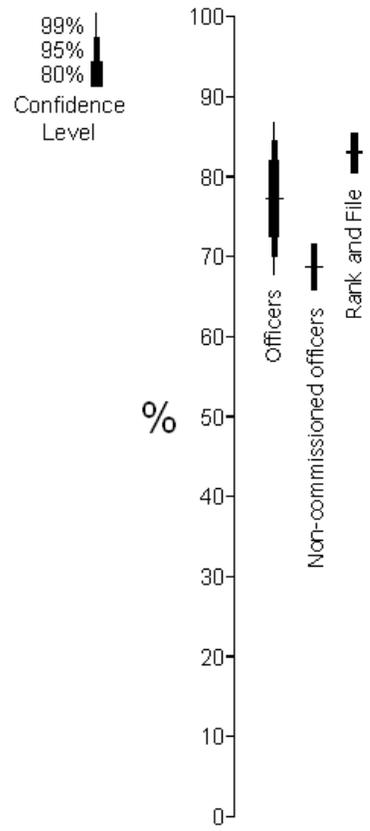
Positive response to condom use with regular sex partners by age group.



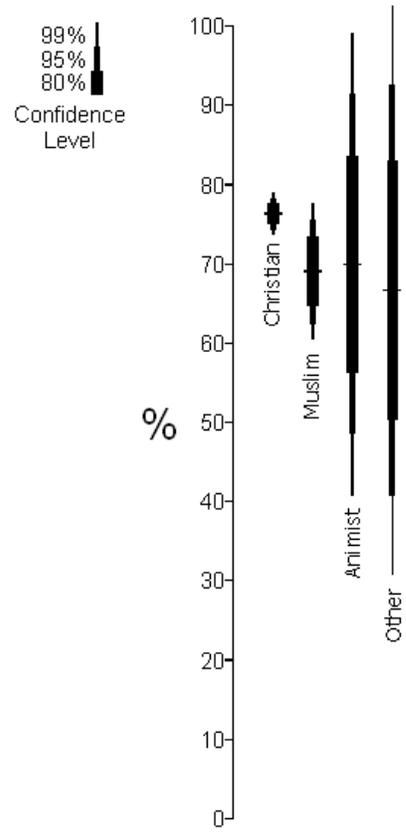
Positive response to condom use with regular sex partners by gender.



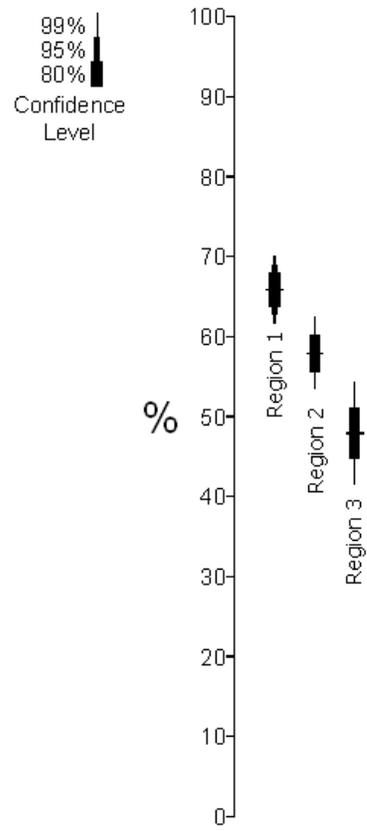
Positive response to condom use with regular sex partners by marital status.



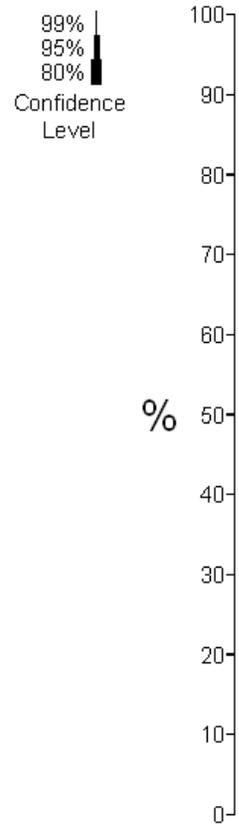
Positive response to condom use with regular sex partners by military rank.



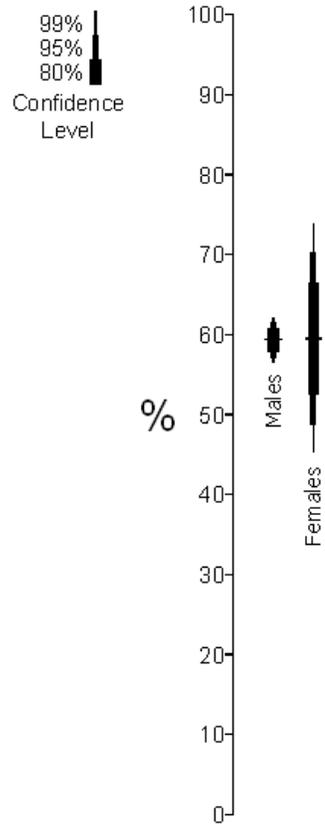
Positive response to condom use with regular sex partners by religious affiliation.



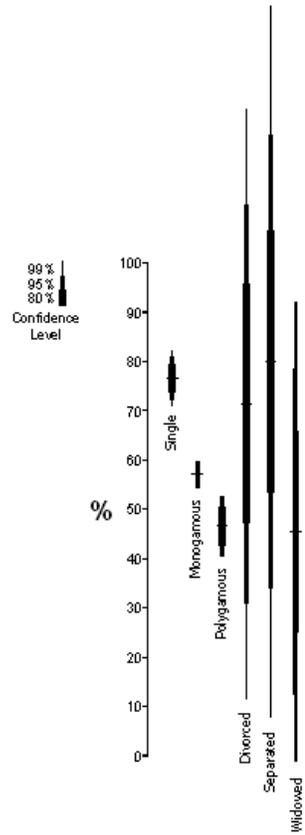
Positive response to condom use in the past six months by military region.



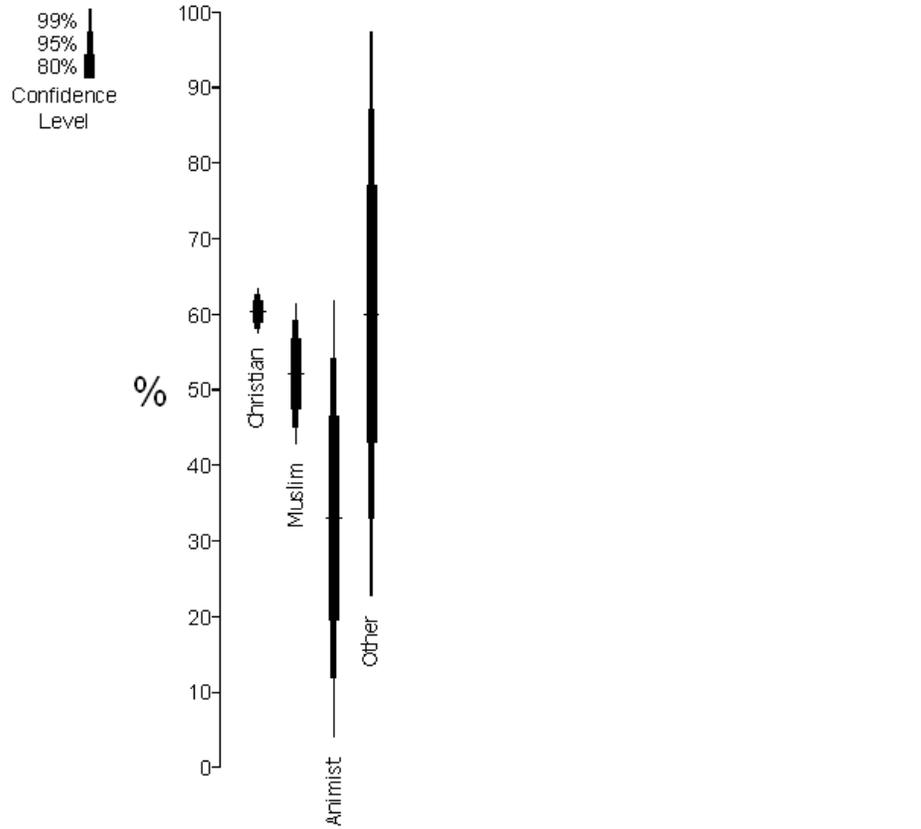
Positive response to condom use in the past six months by age.



Positive response to condom use in the past six months by gender.



Positive response to condom use in the past six months by marital status.



Positive response to condom use in the past six months by religious affiliation.

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