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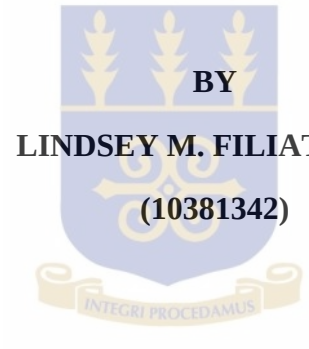
UNIVERSITY OF GHANA

LEGON

FACTORS INFLUENCING HIV TESTING AND COUNSELING UPTAKE IN THE CAPE COAST METROPOLITAN OF GHANA



BY

LINDSEY M. FILIATREAU

(10381342)

THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE

JULY 2013

DECLARATION

I, Lindsey Filiatreau, declare that except for the other people's investigations which have been duly acknowledged, this work is the result of my own original research, and that this dissertation, either in whole of in part has not been presented elsewhere for another degree.

Lindsey M. Filiatreau
STUDENT

Dr. Priscillia Nortey

SUPERVISOR

DEDICATION

For Granny, I know you're still looking out,

and Oliver, it's true, I missed you for this.

Sorry, oh.

ACKNOWLEDGEMENTS

First and foremost I would like to acknowledge Rotary International for granting me the opportunity to study at the University of Ghana, Legon and complete my Master of Public Health on a Rotary Ambassadorial Scholarship. Without the support of the Bowling Green Noon Rotary Club of District 6710 this experience would not have been financially possible. I would also like to acknowledge Dr. Audra Jennings and Dr. Melinda Grimsley-Smith for encouraging me to finish my scholarship application and for continuing to revise my consistently late essay drafts with smiles on their faces. It would be remiss of me to go without giving thanks to Dr. Michael Stokes, my mentor and academic rock, and his lovely wife, Mrs. Cheryl Kirby-Stokes, my inspiration and emotional rock. It is these two who have ultimately shaped my life in such a way that I have ended up in Ghana and because of them that I have developed a love for the continent that will keep me coming back for years on end. Of course a special thank you goes out to my family at home for their continued support of my crazy adventures and unfaltering love… it is you alone that I could not live without.

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ABSTRACT

Only 25% of individuals aged 15-49 in the African Region know their HIV sero-status. In the Cape Coast Metropolitan Area of Ghana, just 3.2% of men and 6.7% of women aged 15-49 had been tested within the past 12 months and knew their status at the time of the 2008 Demographic and Health Survey. At 9.6%, the Cape Coast sentinel site reported the highest prevalence of HIV in the country in 2011. The Central Region as a whole saw an increase in prevalence from 1.7% to 3.7% from 2010 to 2011. The main objective of this study was to determine factors influencing HIV testing and counseling uptake in the Cape Coast Metropolitan Area.

A population based cross-sectional study was carried out among 75 males and 145 females aged 15-49 in the study area. Multi-stage cluster sampling was used to obtain this population-representative sample in 12 enumeration areas throughout the Metropolitan. The random walk method was utilized in sampled enumeration areas to obtain study participants. Trained research assistants verbally administered the survey questionnaire.

From the study, more females than males (33.1% versus 24.0%) had been tested for HIV within the past 12 months and received their results. The primary reason among both sexes for failure to test was fear of stigmatization (63.6% and 72.1%), followed closely by fear of test results (54.6% and 60.3%).

For male respondents, HTC uptake was 12.44 (1.83, 91.24) times higher in individuals that had traveled 5 or more times within the past twelve months in comparison to no travel at all. Uptake was 90% (aOR=0.1029, 95% CI= 0.01, 0.72) lower in individuals that believed HTC uptake could lead to an early death.

For females, testing was lower among those that had only attended some secondary high school (aOR=0.0766, 95% CI=0.0098, 0.5968), believed HTC could lead to an early death (aOR=0.2480, 95% CI=0.0653, 0.9412), and had not has sexual intercourse within the past 12 months (aOR=0.025, 95% CI= 0.001,0.6195). Females that were not currently working as students, traders, or civil servants were 35 times more likely (CI=2.4680, 516.07) to have been tested than those currently attending school.

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LIST OF ACRONYMS

AIDS	-	Acquired Immunodeficiency Syndrome
ANC	-	Antenatal Care
ART	-	Anti-retroviral therapy
DHS	-	Demographic Health Survey
EA	-	Enumeration Area
FGD	-	Focus Group Discussion
FHI	-	Family Health International
GHS	-	Ghana Health Service
HTC	-	HIV and AIDS Testing and Counseling
HIV	-	Human Immunodeficiency Virus
JHS	-	Junior high school
MARP	-	Most at risk populations
MOH	-	Ghana Ministry of Health
MTCT	-	Mother-to-child transmission
NACP	-	National AIDS Control Program
PLWHA	-	People living with HIV and AIDS
SHS	-	Senior high school
STD	-	Sexually transmitted disease
STI	-	Sexually transmitted infection
UN	-	United Nations
UNAIDS	-	Joint United Nation Program on HIV and AIDS

USAID	-	United States Agency for International Development
VCT	-	Voluntary testing and counseling
WHO	-	World Health Organization
WHO/AFRO	-	World Health Organization/ Regional Office for Africa

DEFINITION OF TERMS

Client-initiated testing*- HIV testing and counseling that is typically considered traditional VCT whereby an individual expresses a desire to know their HIV status and requests testing at an HTC facility

Diagnostic testing*- HIV testing which takes place in the clinical setting and aids in patient care management

HIV testing*- an umbrella term that typically refers to both HIV testing and counseling

HIV testing uptake- the utilization of HIV testing and counseling services by individuals

Opt-in testing*- Routine HIV testing and counseling that clinic attendees are offered during their clinic visit

Opt-out testing*- Routine HIV testing and counseling that clinic attendees are informed will take place unless they refuse

Provider-initiated testing*- HIV testing and counseling that is carried out in the healthcare facility to diagnose patients with symptoms of HIV, non-symptomatic patients from areas of high HIV prevalence, or at clinics used by high-risk populations

Voluntary testing and counseling (VCT)*- HIV testing and counseling that involves both pre and post test counseling and is administered after voluntary, informed consent is provided by a client

* denotes definition derived from Obermeyer & Osborn (2007)

CHAPTER ONE

1.0 Introduction

1.1 Background

HIV and AIDS were first identified in 1981 (Center for Disease Control, 1981). Since this time, over 60 million people have contracted the infection, over 30 million deaths have occurred and over 16 million children have been orphaned as a result of the disease (United Nations General Assembly, 2011). In 2011, approximately 34 million people were living with HIV and AIDS (PLWHA), 2.5 million new cases were diagnosed (approximately 7000 cases per day) and 1.7 million lives were claimed because of HIV and AIDS worldwide (UNAIDS, 2012a).

While measures to control the pandemic, and funding to support these measures, have increased dramatically over the past three decades, particularly since the 2001 Declaration of Commitment on HIV/AIDS and the 2006 Political Declaration on HIV/AIDS, declines in the number of new cases, number of deaths caused by the infection, and number of people discriminated against because of their sero-status have not been sufficient. At the current rate of decrease, Joint United Nation Program on HIV/AIDS' (UNAIDS) goal to have zero new infections among children and zero cases of stigma and discrimination against PLWHA by the year 2015 will not be met (UNAIDS, 2012b; United Nations General Assembly, 2001, 2006, 2011)

HIV and AIDS remain most prevalent in the sub-Saharan Africa sub region with 68% of all PLWHA residing here. Nearly one in 20 adults are affected within the sub region and in 2011 70% of all infections reported throughout the year occurred in the area, despite the overall decline in new infections (UNAIDS, 2011, 2012a, 2012b; United Nations General Assembly, 2011).

In Ghana, HIV and AIDS have remained endemic since the first case was reported in 1986. The annual HIV sentinel survey documents a downward trend in the infection from a peak of 3.6% in 2003 to 2.1% in 2011. In 2011 there were 225,478 adults and children living with HIV and 12,077 new infections were documented (Ghana AIDS Commission, 2012).

Several approaches to reverse the spread of the HIV and AIDS pandemic have evolved throughout the world since 1981. In the early stages of the spread of this infection there was a major focus on developing more effective treatment programs and making this treatment more readily available to PLWHA (Baggaley et al., 2012). As access to anti-retroviral therapy (ART) increased it became essential to look at strategies to *prevent* the spread of the disease (Baggaley et al., 2012; De Cock, Mbori-Ngacha, & Marum, 2002; Luginaah, Yiridoe, & Taabazuing, 2005; Marum et al., 2012; Matovu & Makumbi, 2007).

In the past decade, particularly since the publication of the 2004 UNAIDS/WHO Policy Statement on HIV Testing (Joint United Nations Programme on HIV/AIDS & World

Health Organization, 2004), HIV testing and counseling (HTC) has garnered significant attention as a strategy for preventing the spread of this infection. The United Nations General Assembly (2011) has stressed the importance of "expanding and promoting voluntary and confidential HIV testing and counseling and provider-initiated HIV testing and counseling." HTC can promote safe sexual practices among sero-positive and sero-negative individuals and serves as the entry point to seeking and obtaining treatment for one of the world's most serious health challenges (Oberzaucher & Baggaley, 2002). Among affected individuals, testing can also lead to prolonged life, reduce the occurrence of morbidity if infection is identified early, and minimize the rate of transmission of the disease (Obermeyer & Osborn, 2007; UNAIDS, 2012b; Vermund & Wilson, 2002; World Health Organization Regional Office for Africa, 2011). Figure 1 below outlines other benefits of HTC uptake.

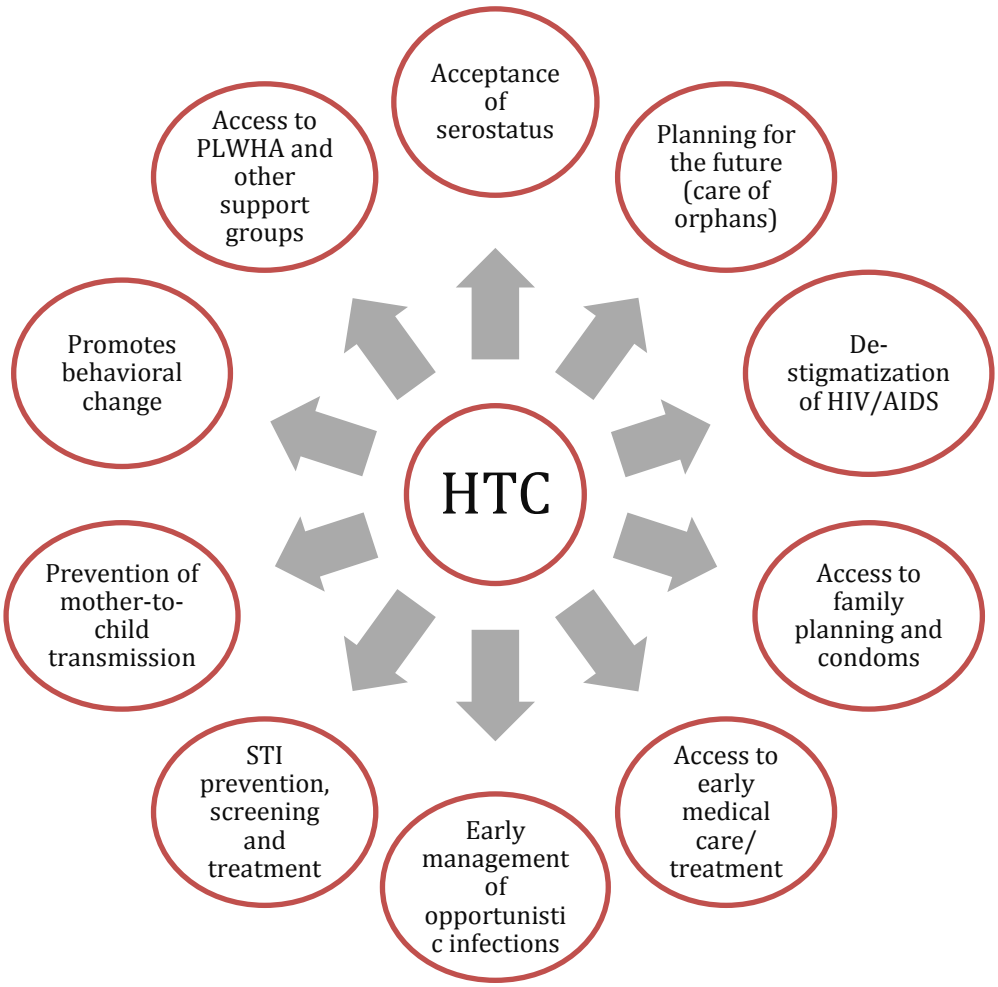


Figure 1: HTC and its links to other health services (UNAIDS, 2000)

As the World Health Organization Regional Office for Africa (2011) stated, "High-quality HIV testing and counseling services are the gateway to universal access to HIV prevention, treatment, care and support."

1.2 Statement of the Problem

HTC services have become increasingly more available worldwide since the availability of effective treatment improved and UNAIDS/WHO released their Policy Statement on HIV Testing in 2004. Despite this increase in availability and attention, however, uptake of HTC services remains low (Angotti et al., 2009; Matovu & Makumbi, 2007; Obermeyer & Osborn, 2007). Many studies conducted in sub-Saharan Africa in the past decade show that while the majority of the population is *willing* to be tested or would like to know their HIV status, few individuals actually access HTC services (Angotti et al., 2009; Appiah et al., 2009; Iliyasu, Abubakar, Kabir, & Aliyu, 2006; Irungu, Varkey, Cha, & Patterson, 2008; Tenkorang & Owusu, 2010). The World Health Organization Regional Office for Africa (2011) reported that over 75% of individuals aged 15- 49 living in the African Region do not know their HIV status. Thus, transmission of the disease remains high, and people continue to suffer from a treatable infection. The World Health Organization (2011) also states that, "an estimated 7.5 million people are eligible for treatment but are not accessing ART because they are unaware of their HIV sero-status."

The Ghana Demographic and Health Survey (DHS) conducted in 2008 reported that 6.8% of Ghanaian women and 4.1% of Ghanaian men aged 15-49 had been tested for HIV within the past 12 months and knew their status. Though 70% of women and 75% of men knew where to obtain an HIV test, just 16.9% of women and 12.7% of men reported ever being tested and receiving their results. In the Central Region specifically uptake of testing services was even lower, as seen in Table 1 below. In the region, 3.1%

of Ghanaian men and 6.7% of Ghanaian women aged 15-49 had been tested for HIV within the past 12 months and knew their status.

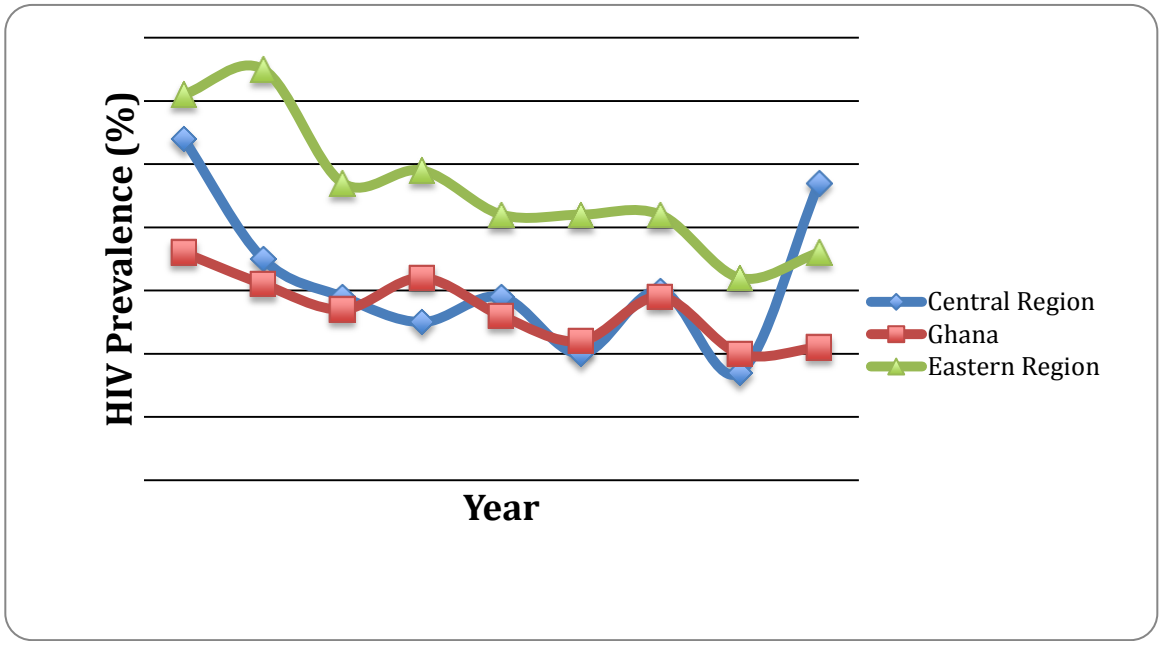
Table 1. HTC uptake among men and women aged 15-49 in Ghana in 2008

	Men		Women	
	Last 12 months	**Ever**	**Last 12 months**	**Ever**
Ghana	4.1	12.7	6.8	16.9
Central Region	3.1	8.5	6.7	18.3

Though 76.0% of women and 84.1% of men knew where to obtain an HIV test, just 18.3% of women and 8.5% of men residing the Central Region had ever been tested and received their results (Ghana Statistical Service, 2009). Given the importance of HTC uptake and of knowing your sero-status, these rates are alarmingly low.

The annual HIV sentinel surveys (conducted by the National AIDS Control Program to monitor the HIV/AIDS epidemic in the country) have shown that HIV prevalence in the Central Region increased from 1.7% to 4.7% between 2010 and 2011, presenting another cause for concern within the country (Ghana AIDS Commission, 2012; National AIDS/STI Control Program, 2012). The Central Region now suffers the highest HIV burden in Ghana, surpassing the Eastern Region, which has had a consistently high HIV prevalence over the past decade but reported a prevalence of just 3.6% in 2011 (see Figure 2 below). The Cape Coast sentinel site, located within the Central Region, also experienced a dramatic increase in prevalence from 2010 to 2011, reporting a prevalence of 9.6% in 2011, the highest of all 40 sites surveyed (Ghana AIDS Commission, 2012; National AIDS/STI Control Program, 2012).

Figure 2: Trend of HIV prevalence in Ghana 2003-2011 (National AIDS/STI Control Program, 2012)



1.3 Conceptual Framework

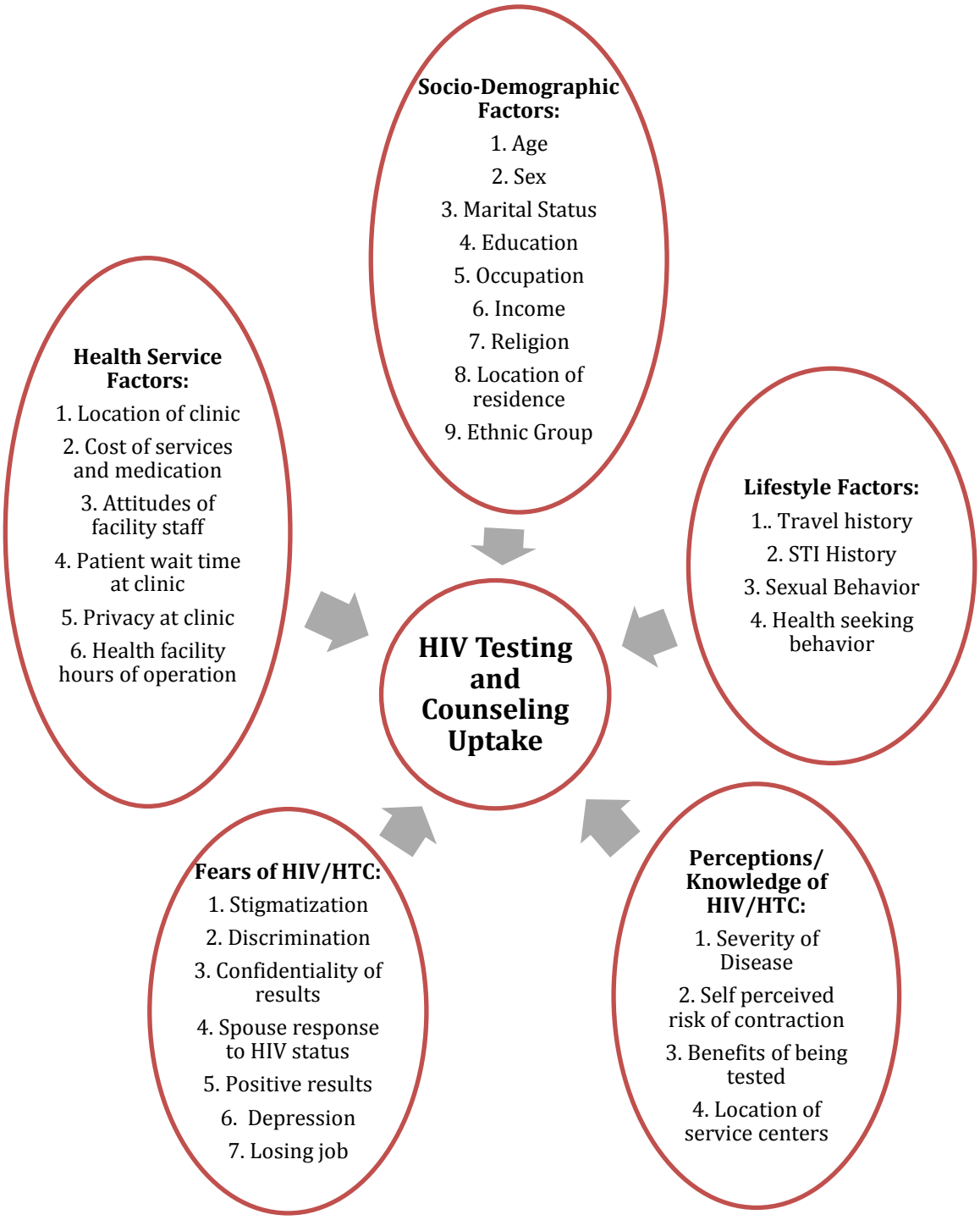


Figure 3: Conceptual framework for factors influencing HIV testing and counseling uptake

In an effort to identify why testing uptake remains low, it is essential to consider factors that contribute to HIV testing and counseling uptake. In Figure 3 above, factors influencing HIV testing and counseling uptake are categorized and outlined. It has been seen in the literature that fears of HIV or HTC, perceptions and knowledge of HIV and HTC, lifestyle factors, socio-demographic factors, and health service factors can all influence whether an individual has or has not been tested for the virus. In many cases, multiple factors combined may contribute to the decision to test. These factors will be discussed further is section 2.5.

1.4 Justification

The Central Region has the highest HIV burden in Ghana with the Cape Coast sentinel site reporting a prevalence of 9.6% in 2011. The dramatic increase seen in prevalence in the region from 2010 to 2011 is largely unaccounted for. While this study does not seek to investigate the causes behind the increase, it is essential to determine the HTC uptake rate and factors influencing uptake in the area. Through maximized utilization of testing services and knowledge of one's status, transmission of the infection can be minimized.

There is no single answer to improving HTC uptake among individuals worldwide. In order to ensure maximum utilization, service delivery systems should be designed specifically to cater to the wants and needs of very specific populations, cultures, and economic conditions. The results of a study conducted on factors influencing HTC uptake in one area of the world are more often not applicable to other areas.

In Ghana, there have been relatively few papers published from studies on this topic. Baiden et al.(2007) conducted a cross sectional survey on using lay counselors to promote testing uptake in Northern Ghana, and Ulasi et al., (2009) conducted a survey on HIV related stigma in Kumasi, Ghana. Other recent publications that do not stem from the results of the Ghana Demographic and Health Survey (DHS) are minimal. While it is possible data has been collected in the Cape Coast Metropolitan Area regarding factors influencing HTC uptake, it has not been reviewed and published at this time.

In addition to this, there has been a dramatic increase in HTC service availability in Ghana in recent years. It is likely that this increase and the initiation of the "Know Your Status Campaign" have had a significant impact on the uptake of HTC services. In order to establish the effectiveness of this campaign and the increase in service availability, current data on testing uptake is essential.

In identifying factors that influence HTC uptake in the Cape Coast Metropolitan Area, more effective HTC delivery methods can be established and HTC uptake can be maximized. It is our hope that this will also contribute to efforts to help curb the recent increase in the prevalence of HIV in the metropolitan area. As more people learn their HIV sero-status, utilization of ART will increase, transmission of the disease may slow, and the prevalence of HIV in the area may begin to decline.

1.5 Objectives

1.5.1 General Objectives

To determine factors influencing HIV testing and counseling utilization in the Cape Coast Metropolitan Area of Ghana.

1.5.2 Specific Objectives

1. To determine HIV testing and counseling service availability in the study area.

2. To determine the percentage of the study sample that has been HIV tested within the past 12 months and know their status.

3. To determine factors influencing HIV testing and counseling utilization among men and women in the study area

CHAPTER TWO

2.0 Literature Review

2.1 Overview of HTC

HIV testing and counseling has significantly evolved since testing first began in the mid-1980s (De Cock et al., 2002; Obermeyer & Osborn, 2007). When HIV and AIDS were newly emerging diseases, testing existed while treatment did not, thus creating much controversy concerning the ethics and relevance of widespread testing programs (Bayer & Edington, 2009; Bayer & Fairchild, 2006; Bayer, 1991). Counseling was established primarily to explain to those being tested what the meaning of a positive test result could mean for them, and to encourage behavioral changes in individuals' sexual practices (Bayer & Edington, 2009; Branson, 2006). During this time, the World Health Organization (WHO) advised that routine HTC be carried out among blood donors only and that all other testing and counseling services remain strictly voluntary with a pre and post-test counseling session. The fact that there was no cure or treatment for the infection significantly hindered uptake of services while stigma and fear of discrimination served as additional deterrents to testing (Bayer & Edington, 2009; Branson, 2006; Iliyasu et al., 2006; Irungu et al., 2008; Marum et al., 2012; Mulogo, Abdulaziz, Guerra, & Baine, 2011; Ulasi et al., 2009).

By the mid-1990s, knowledge about HIV and AIDS had increased and effective treatment for the infection had been discovered. At this time, the approach to HTC drastically changed and the importance of knowing your status through HIV testing and

counseling was more readily stressed in the healthcare sector (Bayer & Edington, 2009; Branson, 2006; De Cock et al., 2002). Routine testing and counseling was recommended for high-risk populations and hospital patients living in areas with an HIV prevalence of greater than 1%. By 1995, the Center for Disease Control and Prevention had also recommended testing and counseling for all pregnant women as the capability to reduce the risk of mother-to-child transmission developed (Bayer & Edington, 2009; Branson, 2006). This was an effort to slow the spread of the now rapidly developing pandemic, and reverse the damage that had been done by creating a sphere of stigma and fear around the disease when it first emerged (Bayer & Edington, 2009).

As HIV continued to spread, views regarding an appropriate approach to HTC in the human rights and public health communities did not converge. A struggle remained based on the technicalities of consent and how much emphasis should be placed on pre-test counseling; should routine testing take place in all health care settings for all individuals at risk or should testing remain strictly voluntary with a strong emphasis on pre-test counseling? From this struggle, multiple approaches to HTC were adopted worldwide. Figure 4 below outlines some of the major HTC options currently available in most areas of the world.

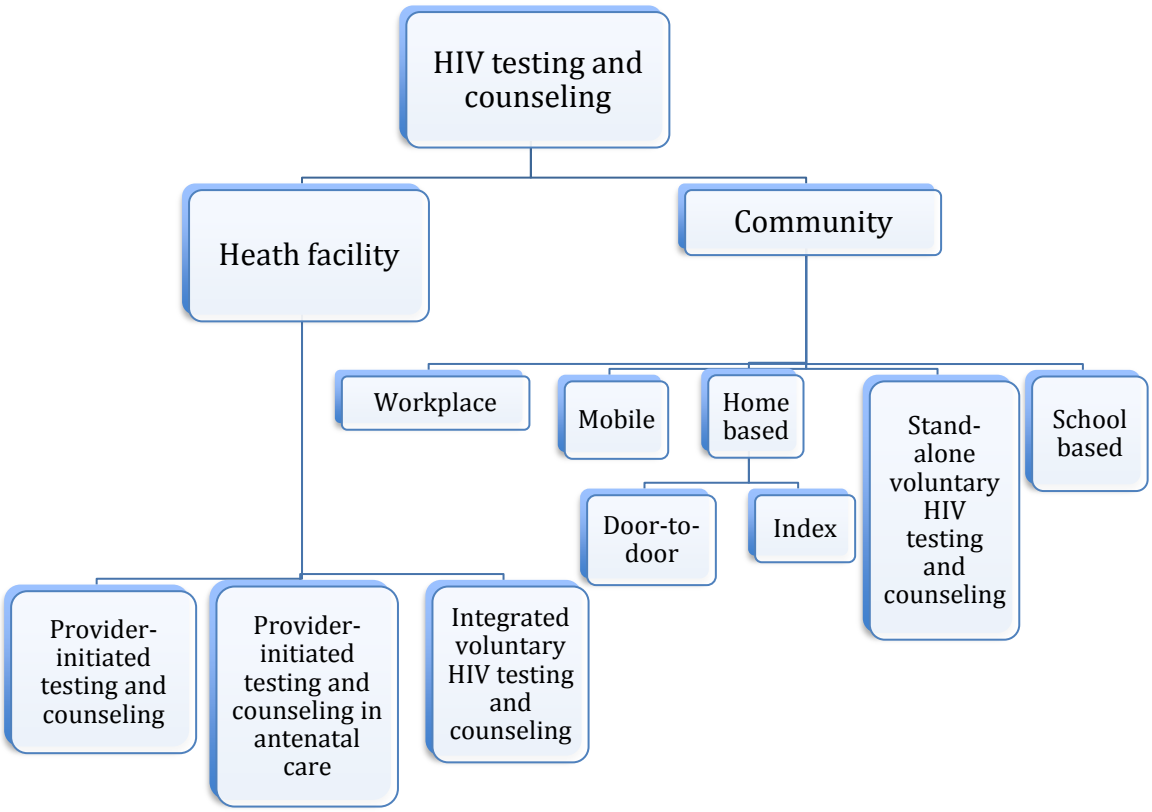


Figure 4: Models of HIV testing and counseling services (WHO, UNAIDS, UNICEF, 2011)

Voluntary counseling and testing (VCT), as it was initially coined, refers to testing that is completed upon request from an individual. VCT has since been broken down into two types of testing: client-initiated testing and provider-initiated testing. Client-initiated HIV testing and counseling refers to what was typically considered traditional VCT: when an individual expresses a desire to know their HIV status and requests testing at an HTC facility. Provider-initiated testing and counseling refers to testing that is carried out in a healthcare facility to diagnose patients with symptoms of HIV, non-symptomatic patients from areas of high HIV prevalence, or at clinics used by high-risk populations.

Consent for the test is obtained before the test is administered and the services include both pre and post test counseling (Obermeyer & Osborn, 2007).

Diagnostic testing refers to services that take place in the clinical setting to aid in patient care. In more recent years, most countries have also adopted routine offer of HIV testing and counseling. During offer of routine testing and counseling clinic attendees may be asked if they would like to receive HIV testing and counseling during their visit ("opt-in testing") or are informed they will be tested for HIV as a part of a routine assessment unless they choose to opt out ("opt-out testing") (Obermeyer & Osborn, 2007). In many parts of the world, testing is sometimes mandatory as a part of pre-employment screening, visa application processes, religious orders, or for military requirements as well (De Cock et al., 2002).

There are numerous other models of outreach designed to increase HTC service uptake. These include couples testing in which couples are encouraged to test together, home-based testing which eliminates several inconveniences often associated with travel to HTC facilities, rapid-testing that allows individuals to receive their results almost immediately, and antenatal testing in which pregnant women are routinely screened for HIV during their antenatal clinic visits (Obermeyer & Osborn, 2007).

With the increased attention to HTC and dedication to making HTC more readily available, desirable, and effective, HTC in 87 reporting countries has seen an increase from approximately 64 million tests in 2009 to 72 million tests in 2010 (WHO, UNAIDS, UNICEF, 2011). In addition to this, testing among pregnant women has risen from 8% in

2005 to 35% in 2010 (World Health Organization, 2011) which likely contributes to the fact that women are more likely to get tested than men (WHO, UNAIDS, UNICEF, 2011).

2.2 HTC in Africa

HTC availability and uptake in Africa has seen significant improvement since the first voluntary testing services began in Uganda in 1990 (Marum et al., 2012). While it remains controversial, mandatory testing is common throughout the region (De Cock et al., 2002). In conjunction with other recently expanded methods, this method of testing, although not generally preferred, has likely contributed to the number of people who know their status.

The number of HTC facilities has seen continuous improvement in the region as well. In December 2009, more than 31,000 facilities in 43 countries in the African sub region were providing testing and counseling services, and a subset of 33 countries that were consistent in their reporting from 2007 to 2009 saw an 86% rise in availability of services at various health facilities (World Health Organization Regional Office for Africa, 2011).

From 2005 to 2010, HTC increased from 14% to 61% among pregnant women in southern and eastern Africa (WHO, UNAIDS, UNICEF, 2011) and in 2009 over 40 million tests were administered to people aged 15 and above in the Region (World Health Organization Regional Office for Africa, 2011). Unfortunately 75% of people aged 15-49 in the African Region still do not know their status, and many high-risk populations

are among this 75% (WHO, UNAIDS, UNICEF, 2011). Socio-demographic and individual factors, health services factors, perceptions and knowledge of the disease, and fears concerning HIV continue to serve as barriers to the uptake of services (Matovu & Makumbi, 2007).

2.3 HTC in Ghana

ART has been widely available in Ghana since 2004 (Wilcher & Martin, 2004). The National AIDS Control Program (NACP) has since been able to place HTC at a high priority in the prevention of new infections. In general, HIV services within the country are offered free of charge or at greatly subsidized rates; counseling and testing is free of charge while ART services are highly subsidized through the Global Fund for AIDS, TB and Malaria (Ghana AIDS Commission, 2012). In most testing facilities a rapid-response HIV anti-body test is also utilized so clients can receive their results within ten minutes of test administration, thus eliminating the risk of clients not returning for their results. All clients receive pre-test information about the test and most go through post-test counseling. Individuals receiving a positive test result also receive a confirmatory blood test free of charge.

In 2010 alone, over 250 new HTC centers were established around the country bringing the total number of testing and counseling sites to 1,174. In the same year, the "Know Your Status Campaign", initiated in 2008, became a greater priority and saw significant success with over one million people tested in the country. In 2008 the number of individuals being tested during this campaign was a mere 467,935, a number that

increased to 1,063,085 individuals in 2010 and 1,151,034 in 2011 (Ghana AIDS Commission, 2012).

A significant emphasis has also been placed on reducing the incidence of HIV in Ghana by reducing mother-to-child transmission (MTCT) of the virus. All pregnant women seeking antenatal care (ANC) are supposed to be counseled about HIV and AIDS and offered an HIV test. In 2008 49.8% of women age 15-49 who gave birth in the two years preceding the administration of the DHS received HIV counseling during ANC (Ghana Statistical Service, 2009). Additionally, 23.9% of women were counseled, offered and accepted an HIV test and received their results (Ghana Statistical Service, 2009).

Despite the high emphasis placed on educating the general public about HIV and AIDS prevention, transmission, and treatment, knowledge remains a significant barrier to the uptake of HTC services (Ghana Statistical Service, 2009). As stated by the Ghana AIDS Commission (2011) "…it is clear, that though considerable efforts have been made towards increasing counseling and testing in Ghana much more needs to be done to ensure counseling and testing in the general population becomes universal."

2.4 HTC in the Central Region and Cape Coast Metropolitan Area

The Cape Coast Metropolitan Health Directorate (2012) reports fourteen clinic based HIV testing sites in the Cape Coast Metropolitan Area. These locations include:

- Central Regional Hospital,
- Cape Coast Metropolitan Hospital,

- Cape Coast Reproductive and Child Health Central,
- Ewim Polyclinic,
- Essuekyir Community-based Health Planning and Services Compound,
- Nkanfoa Community-based Health Planning and Services Compound,
- Adisadel Urban Health Centre,
- Efutu Health Centre,
- Ekon Community-based Health Planning and Services Compound,
- Brofoyedur Community-based Health Planning and Services Compound,
- Akotokyir Community-based Health Planning and Services Compound,
- Baiden Ghartey Memorial Hospital (private),
- Brimso Community-based Health Planning and Services Compound and
- the University of Cape Coast Hospital.

Public sector testing facilities in the Cape Coast Metropolitan utilize the rapid-response HIV anti-body test, and confirmatory test used in other facilities throughout the country. As mentioned, Ghana Health Services has mandated that all public healthcare facilities provide this service free of charge, though private facilities are not forced to adhere to this mandate.

Within the Central Region, although 76.0% of women and 84.1% of men know where to get an HIV test, just 24.4% of women and 10.0% of men have ever been tested (Ghana Statistical Service, 2009). In 2012, a total of 1,687 males and 1,569 females received pretest information, 1,649 males and 1,545 females were tested, 111 males and 190

females had positive test results, and 1,624 males and 1,537 females received posttest counseling at testing facilities located within the Cape Coast Metropolitan Area specifically (Cape Coast Metropolitan Health Directorate, 2012).

2.5 Factors influencing HTC Uptake

In an effort to control the spread of the HIV and AIDS pandemic through HTC services, a number of studies have been conducted worldwide to determine factors that influence the uptake of these services. From these studies, several factors have been identified, most varying from location to location. Among those identified are socio-demographic factors (e.g. age, sex, marital status, etc.), lifestyle factors (e.g. health seeking behavior, travel history, etc.), health service factors (e.g. location of health clinics, cost of services, etc.), knowledge/perceptions of HIV (e.g. where to access HTC services, knowledge concerning the benefits of testing, etc.) and fears about HTC (e.g. stigma, discrimination, early death, etc).

2.5.1 Socio-Demographic Factors Influencing HTC Uptake

HTC uptake varies significantly based on socio-demographic factors. Age, sex, marital status, religion, education, occupation, ethnic group, location, and income can all play a role in whether or not an individual chooses to, or has the ability to get tested for HIV.

In a study of 8,970 individuals living in rural Tanzania differences in age, sex, religion, marital status, and ethnic group were all associated with the desire for VCT uptake.

While 31% of men expressed a desire to get tested, only 24% of women reported an interest. For both males and females, desire for testing was highest among participants with the most years of education, Muslims, and those from non-Sukuma tribes. Desire for testing was lowest among widowed participants, those above 45 years of age, those without an education, and those following traditional beliefs (Wringe et al., 2008).

Only 12% of males and 7% of females actually completed the testing and counseling process in this study, however, and socio-demographic characteristics of those completing the process differed slightly from those who expressed a desire to test. Among the males, completion was highest among those with a recent change in their marital status, those from non-Sukuma tribes and lowest among those with no education or those following traditional beliefs. Among the females, completion was highest among those living in roadside villages, those with the most years of education, Muslims, and those who had never married or were separated or divorced. Uptake was lowest among females with no education (Wringe et al., 2008).

A review of the 2003 Nigeria National DHS conducted by Nwachukwu & Odimegwu (2011) and a review of a nationally representative study conducted by Agha (2012) in Mozambique in 2009 also yield similar results to those found by Wringe et al. (2008). In the Nigerian study, males (7.2%) were more likely to volunteer for HTC than females (3.1%), as were those living in urban (females=3.3%) versus rural areas (females=1.0%), those who were more highly educated, and those of a higher economic status. Hendriksen et al. (2009), however, reported contradictory results in Thailand, South Africa, and

Tanzania. In Thailand participants going for HTC were three times more likely to be women, two times more likely to be women in Vulindlela, South Africa, five times more likely to be women in Soweto, South Africa, and two and half times more likely to be women in Tanzania.

In a Ugandan study conducted by Sekandi et al. (2011), no significant difference was seen in testing uptake among participants of different sexes or various religions. Marital status, age, and education level, however, were still found to have an effect on uptake. Marital status was also found to have the same effect on HTC uptake in the study conducted by Agha (2012). Female respondents that had never been married were less likely to go for HTC than those who were married (Agha, 2012).

From the 2008 Ghana DHS, the relationship between various socio-demographic factors and HTC uptake can also be seen. From this population based study, it was found that testing uptake was lowest among those ages 15-19 and highest among women ages 25-29 and men ages 30-39. Women had a higher uptake of testing than men at all ages except 40-49 and married individuals were more likely to access HTC services than those who had never been married. As in most other studies, education and income were also positively correlated with the uptake of testing (Ghana Statistical Service, 2009).

2.5.2 Lifestyle Factors Influencing HTC Uptake

Individual health seeking behaviors, history of STIs, sexual practices, and travel history have also been found to influence uptake of HTC in some settings.

In the study conducted by Wringe et al. (2008), desire for HTC was highest among participants who had had sex with a high-risk partner or practiced inconsistent condom use during sexual intercourse. Actual completion of the testing and counseling process was highest among those who had had sex with a high-risk partner.

In a study conducted by Ostermann et al. (2011) in Tanzania sexual behavior of study participants was also associated with testing uptake. Female participants with a greater number of lifetime sexual partners and both male and female participants with a history of two or more sexual partners in the past three months were more likely to access HTC services than those with a lower number of lifetime partners or those with one or fewer partners in the past three months respectively. Conversely, results from the study conducted by Agha (2012) in Mozambique showed that at 29% testing uptake is lower among women that have had four or more sexual partners in their lifetime than those with just one lifetime partner at 38%.

In Nigeria, specific health seeking-behaviors of respondents led to a positive correlation with HTC uptake. Study participants that wanted to access HTC services stated that this desire was motivated by the opportunity to take advantage of treatment early in the onset of the infection and prevent the spread of HIV/AIDS to sexual partners and unborn children (Iliyasu et al., 2006). In Nakuru, Kenya, respondents wishing to be tested for HIV also attributed this desire to the early uptake of treatment, or preparing for death, pending a positive test result (Irungu et al., 2008).

2.5.3 Knowledge/ Perceptions Influencing HTC Uptake

An individual's knowledge of HIV and AIDS and its severity, knowledge of where to access HTC services, knowledge of the benefits of being tested, and his or her perceived risk of contracting the infection can play a significant role in his or her ability and/or decision to access HTC services.

In a study conducted among undergraduate students in two Nigerian institutions the primary reason participants had not utilized HTC services was because they did not know where to access services (Uzochukwu, Uguru, Ezeoke, Onwujekwe, & Sibeudu, 2011). Another Nigerian study yielded similar results. Most respondents reported knowing what HIV testing and counseling was (55%), while only 26% of those knowing what HTC was reported knowing where to access these services (Iliyasu et al., 2006). As 70% of Ghanaian women and 75% of Ghanaian men reported knowing where to obtain an HIV test, knowledge of testing facility location does not appear to serve as a major barrier to uptake in Ghana (Ghana Statistical Service, 2009).

In rural Tanzania the relationship between knowledge of HTC service location and testing uptake was also observed. Desire for HTC uptake and actual completion of the testing process was highest among study participants who had heard of HTC or utilized the services before and lowest among those with no knowledge of HTC or prior experience with testing. In this setting, perceived risk also seemed to play a significant role in the process as desire for HTC uptake was highest among individuals with a high perceived risk of contraction (Wringe et al., 2008).

High perceived risk of contracting HIV was also listed as a primary reason for testing in Uganda (Nuwaha, Kabatesi, Muganwa, & Whalen, 2006). However, in a qualitative study conducted by Luginaah et al. (2005) in Ghana, one marriage counselor involved in HTC service delivery reported risk perception as a major barrier to his work. The respondent explained that young couples typically trust their partners and do not think they could be at risk because it is unlikely that their partner has had sexual relationships with other individuals. Because of this, many people do not see the need to be tested.

A lack of understanding of the importance of being tested serves as an additional deterrent for HTC uptake in rural Uganda. In a study conducted by Nuwaha et al. (2006) study participants claim the government has not mentioned HTC as a major way of controlling the spread of HIV. Ugandan men have reported that they are not being tested because, despite the fact that they have heard that they *should* be tested, they do not know *why* they should be tested. Many participants could recite the HIV testing messages broadcasted on the radio, however, most had not gone for testing because these messages continually failed to explain the importance of and benefits of testing (Larsson et al., 2010).

2.5.6 Fears Influencing HTC Uptake

Many argue fear plays the most significant role in determining HTC uptake: fear of stigmatization, discrimination, a breach in confidentiality of test results, receiving a

positive test result, depression, an early death, losing one's job or fear of one's spouse's reaction.

In a study carried out in northern Nigeria, knowledge and attitudes of adults towards VCT were determined. The study reports fear of stigma and discrimination from a positive test result as the top reason (48%) for avoiding testing. Other respondents (34%) also reported fearing the unknown, and a concern of marital disharmony (9%) arising from the decision to test (Iliyasu et al., 2006). In a survey conducted in Nakuru, Kenya, 20.27% of respondents reported no desire for being tested for HIV. Major reasons contributing to this response were fear of results leading to stress and/or depression, discrimination or stigma, or early death (Irungu et al., 2008).

Ulasi et al. (2008) conducted a study to assess HIV/AIDS related stigma and discrimination of PLWHA in Kumasi, Ghana. From the study it was not only seen that workplace discrimination exists but that the majority of respondents (85.6%) had not been tested for HIV or did not know their sero-status. Major reasons given for not testing included fear of stigma and discrimination as well as fear of receiving a positive test result. An additional study conducted by Baiden et al. (2007) yielded similar results. In a series of focus group discussions conducted within the study, concerns of stigma and confidentiality were expressed. Quantitative data confirmed that stigma and discrimination is in fact an issue in the area as 77.2% of respondents would not buy vegetables from PLWHA and 52.1% agreed that any PLWHA should not be permitted to teach. Hendriksen et al. (2009) found evidence to support this association in Thailand as

well, however, saw that stigmatizing behavior had no effect on HTC uptake in two testing sites in South Africa, one in Tanzania, and one in Zimbabwe.

Confidentiality of test results has been listed as a major concern among respondents in multiple studies in sub-Saharan Africa. Focus group participants in studies conducted by Nuwaha (2006) in Uganda, Angotti et al. (2009) in Malawi and Baiden et al. (2007) in Ghana all stress this issue.

A qualitative study on couples' HTC services conducted in eastern Uganda found significant barriers to uptake rooted in distrusting, unstable marriages and fear of their spouse's response. In the study, one focus group respondent stated:

> "It is because we don't tell our wives the truth; you lie to her that she is the only one yet her friends see you with other women. So if we go for testing and find out that we are infected she will immediately start quarrelling since already there is no love that we show each other." (Larsson et al., 2010)

Fear of a positive test result was also discussed as a deterrent of utilizing HTC services. Another focus group respondent stated:

> "It is because men have so many extramarital relation- ships. They lie to their wives that they are faithful, but actually they have many women, not wives but women with whom they have sexual relationships. So when they think about the women they have had intercourse with, they choose to rather stay in the dark without finding out their HIV status. "

A similar study conducted in Botswana reported nearly the opposite. Respondents seemed to believe couples testing would increase the uptake of HTC services and improve marital relationships, which is reflected in the following quote:

> "Partners counseled together adapt better to risk reduction measures than those counseled individually. Testing together helps a couple to deal with their emotions together and accept their HIV status together." (Kebaabetswe et al., 2010).

2.5.7 Health Services Factors Influencing HTC Uptake

If barriers such as knowledge of HIV and HTC services, stigmatization, and discrimination are overcome, a number of health service factors may still deter individuals from HTC uptake. Cost of services, location of testing centers, clinic employee attitudes and competency, clinic hours of operation, wait time, and privacy at the testing site may also play a role in an individual's decision/ability to be tested. In the Baiden et al. (2007) study, the majority of Ghanaians participating in the study (91.1% of respondents) claimed they would like to know their HIV status, although most (88.1%) expressed a desire to be tested outside of a health clinic.

In a study carried out by Nuwaha et al. (2006) in the Bushyi District of Uganda a series of focus group discussions and individual interviews were conducted to determine reasons why people did or did not utilize HTC services. From the study several health service factors were mentioned as barriers to the uptake of services. Among these issues

were: distance to the testing facility, cost of being tested, poor quality of care, and long waiting times before being testing or receiving results.

Respondents from another qualitative survey conducted in Malawi (Angotti et al., 2009) and a study on uptake of couples HTC services in eastern Uganda (Larsson et al., 2010) confirmed that waiting time, distance and cost of traveling to the health facility were discouraging factors in HTC uptake. One Malawian respondent stated,

> "Sometimes we think of going to the hospital in M'Bimbe but you find that you don't have the transport money, then we are forced just to stay [at home] without being tested," (Angotti et al., 2009).

Participants from a study conducted in Tanzania confirmed that distance to the testing facility was the largest barrier to uptake of services, with 33% of non-testers giving distance to a testing facility as their reason for never having tested (Ostermann et al., 2011).

Respondents from both studies (Angotti et al., 2009; Larsson et al., 2010) also mentioned attitude of healthcare professionals as a major deterrent from testing, stating that facility employees are often rude and unwelcoming. In eastern Uganda one respondent explained,

> "You may go with your wife but on reaching there and looking at the way they are treating your wife is unkind, it is not good for the man to be there. These nurses, there is a way these women are treated/.../she is abused and embarrassed.

So for us men, we just choose not to accompany our wives to avoid such things," (Larsson et al., 2010).

Obermeyer & Osborn (2007) brought out a similar concern explaining the complexity and/or difficulty of providing adequate training to health care employees carrying out HTC.

Lack of drugs at the health clinic, cost of drugs when available, organizational problems at the testing facility, and the singling out of HIV patients at the clinic have been cited as additional health service issues in the studies conducted by Larsson et al. (2010) and Iliyasu et al. (2006).

In Botswana the primary concerns brought up with HTC facility services were the hours of operation and the location of services. Participants requested HTC to be conducted in an area where other health services such as STI and cancer screening were conducted to reduce stigma that can result from attending stand-alone centers. Several requests for facilities to be open later during the night and on the weekends and for alternative testing sites to be established were also made (Kebaabetswe et al., 2010).

In the study conducted by Luginaah et al. (2005) in Ghana, several respondents indicated cost of being tested as the primary barrier. In areas where poverty is incredibly severe it becomes difficult for individuals to consider paying for an HIV test a priority.

2.6 Summary

While the literature on factors influencing HTC uptake is extensive, as seen above, it is not exhaustive. There has been minimal literature published on the subject in Ghana since the 2008 Ghana Demographic and Health Survey and none of the literature reviewed above addressed all the factors that can potentially influence HTC uptake. This study seeks to fill this gap, providing a recent and comprehensive review of the factors that influence HTC uptake in the Cape Coast Metropolitan of Ghana.

CHAPTER THREE

3.0 METHODS

3.1 Type of Study

A population based cross sectional study was carried out among sampled individuals aged 15-49 in the Cape Coast Metropolitan Area. A trained research assistant orally administered a descriptive cross-sectional questionnaire to sampled study participants.

3.2 Study Location

This study was conducted in the Cape Coast Metropolitan Area of the Central Region of Ghana. Cape Coast is the capital of the Central Region but remains the smallest geographic metropolis in the country covering only 122 square kilometers. It is bound on the south by the Gulf of Guinea and north, east and west by Twifu/ Hemang/ Lower Dnkyira District, Abura/ Asebu/ Kwamankese District, and Komenda/ Edina/ Eguafo/ Abrem Municipal respectively (Cape Coast Metropolitan Assembly, 2006). The area is now broken into two districts: Cape Coast North and Cape Coast South, which are further broken into 89 and 102 enumeration areas respectively (Ghana Statistical Service, 2012). The Metropolitan Area is apart of both the Abidjan-Lagos Transport Corridor and the Western Corridor, serving as a major transportation hub for tourists and facilitating the transport of goods from Guinea, Mali, Burkina Faso, Cote d'Ivoire, Togo, Benin, and Nigeria (International Organization for Migration, 2012).

In 2010, the reported population of the Cape Coast Metropolitan Area was 169,894 persons, 85,557 from the Cape North District and 84,557 from the Cape Coast South District. It comprises 7.7% of the Central Region population as a whole and is made up of 82,810 males and 87,084 females, (Ghana Statistical Service, 2012). There were 40,386 households in the area in 2010 with approximately 3.5 members per household. While most individuals (70%) live in an urban setting, many remain uneducated and/or unemployed. From the 2010 Population and Housing Survey it was found that 11.12% of individuals aged 15 and over in the Cape Coast Metropolitan Area had never attended school while 8.35% of individuals had just attended primary school (Ghana Statistical Service, 2012). Just 49.59% of individuals in the area were employed (Ghana Statistical Service, 2012). Both these factors, high levels of unemployment and low levels of primary education, predispose the population to HIV.

With a syphilis prevalence of 9.6%, third highest in the country, and a relatively transient population because of the area's role in multiple transportation corridors, there is an even greater risk of the spread of the virus. The Center for Disease Control (2010) reports that individuals infected with STDs are at least two to five times as likely as uninfected individuals to contract the virus after exposure through sexual contact. HIV positive individuals infected with another STD are also more likely to transmit the virus. The International Organization on Migration (2012) also explains that while migration itself is not a definitive risk factor for HIV, "migration and mobility can make migrants vulnerable to high risk sexual behaviours because of the conditions they face during the migration process."

3. 3 Variables

The dependent variable of interest in this study is the uptake of HTC services. Respondents who had tested for HIV within the past 12 months and received their results were considered positive for testing uptake, while those who had never been tested, been tested and never received their results, or been tested more than 12 months prior to survey administration were considered negative for testing uptake.

The independent variables being tested were:

- Socio-demographic factors:
    - Age
    - Sex
    - Religion
    - Location of residence
    - Occupation
    - Income
    - Marital status
    - Education
    - Ethnic group
- Health service factors
    - Attitudes of facility staff
    - Health facility hours of operation
    - Wait time for being tested and receiving results
    - Cost of getting to facility/being tested/getting treatment

  - Distance to testing facilities
  - Privacy at testing facility
- Lifestyle Factors
  - Travel history
  - STI history
  - Sexual practices
  - Health seeking behavior
- Fears concerning HIV and HTC service uptake
  - Stigma/discrimination
  - Spouse's response to being tested/results
  - Positive test results
  - Early death
  - Depression
  - Confidentiality of results
- Knowledge and perceptions of HIV/AIDS and HTC services
  - Self- perceived risk of contracting disease
  - Location of service facilities
  - Benefits of being tested

To determine respondents' exposure to the independent variables of interest, respondents were asked a series of questions regarding their socio-demographic background, lifestyle choices, and their knowledge regarding HIV and HTC service availability. While many of these questions were simple yes or no questions (ex. "Can you ask your partner to use

a condom if you wanted him/her to?") others, such as level of education attained, occupation, religion, and marital status were categorical. All questions with a categorical response always have the option of "Other", allowing the interviewer to note the respondent's exact reply. Count variables such as age, number of sexual partners within the past 12 months, and number of nights spent away from home were recorded exactly as the respondent replied and later grouped into categories for analysis.

To determine why individuals that had not tested within the past twelve months had failed to do this, they were asked to identify factors that contributed to their lack of testing uptake from a list. Any factors participants felt had influenced their decision that were already on the list were noted under "Other" by the interviewer. Individuals that had in fact been tested within the past year were asked about their testing experience (ex. how long it took to receive their results, if they believe their results were kept confidential, etc.)

3.4 Study Population

Males and females aged 15-49 living within the Cape Coast Metropolitan Area were eligible for participation. Individuals under the age of 18 were required to seek written consent from one or more parent before they were permitted to participate. Individuals not meeting these requirements were not eligible.

3.5 Sampling

3.5.1 Sample Size

The sample size for this study was stratified by sex based off the varying rates of HTC uptake among genders. A total sample size of 144 females and 72 males was calculated using the equation $n = \left(\frac{t^2 \times p(1-p)}{m^2}\right)D$. In this equation, n=required sample size, t= confidence level at 95% (standard value of 1.96), p=estimated prevalence of HTC uptake in the Central Region (6.7% among females and 3.2% among males), m=margin of error at 5% (standard value of 0.05), and D=design effect used to adjust for the selected sampling method (1.5 for this study). Questionnaires were administered until the minimum sample size was achieved.

3.5.2 Sampling Method

Stratified, multi-stage cluster sampling was employed in this study. For monetary and time constraints, 12 enumeration areas (EAs) were randomly selected as target study locations from the Cape Coast Metropolitan Area: six from the 102 EAs in the Cape Coast South District and six from the 89 EAs in the Cape Coast North District. This selection was done by Ghana Statistical Service using the probability proportion to size sampling technique. Characteristics of sampled EAs can be seen below in Table 2.

Table 2. Characteristics of sampled enumeration areas

Location	Enumeration Area Code	District	Location Type	Population	Population Proportion*
Kokoado	202302007	North	Rural	1247	0.1092
Kakumdo	202302051	North	Urban	2947	0.2581
Anto Essuekyir	202302066	North	Rural	814	0.0713
Cape Coast (Pedu/ Abura)	202302037	North	Urban	882	0.0773
Brimso	202302081	North	Rural	365	0.0320
Cape Coast (Pedu/Abura)	202302022	North	Urban	81	0.0071
Cape Coast (Vars Ola)	202301008	South	Urban	1348	0.1181
Cape Coast Adisadel	202301093	South	Urban	774	0.0678
Kotokuraba/Tantri	202301076	South	Urban	455	0.0399
Cape Coast	202301042	South	Urban	912	0.0799
Cape Coast	202301025	South	Urban	1165	0.1020
Cape Coast	202301059	South	Urban	426	0.0373
Total				11416	1.0

*These population proportions were used in sample size calculations

Within each EA, a sample size proportionate to that of the population of the EA was determined (as seen in Table 3 in section 4.1 of the Results.)

Using detailed maps of each EA, which were obtained from Ghana Statistical Service, major landmarks serving as boundary indicators for the sampled EAs were numbered starting in the upper left-hand corner of each map. A random number generator was then used to determine a start point landmark for each sampled EA. Beginning at the pre-determined EA start point, the modified random walk method of sampling was then employed to identify households with potential study participants.

Within each household, one eligible, consenting study participant (chosen at random from all eligible, consenting household members) was then asked to participate in the study and verbally administered the questionnaire by a trained research assistant. If

research assistants experienced significant difficulty in obtaining a sufficient number of study participants they were permitted to return to a household already sampled and randomly select another individual from that household for participation in the study.

3.6 Data Collection Techniques/ Methods & Tools

The study questionnaire was designed using the 2008 Ghana DHS (Ghana Statistical Service, 2009) and the AIDS Indicator Survey Model Individual Questionnaire (MEASURE DHS Demographic and Health Surveys, 2011). Surveys were administered by trained research assistants in English, Twi or Fante, as English in the official language of Ghana, Twi is the most common language used, and Fante is the most prevalent language spoken in Cape Coast.

3.7 Quality Control

Research assistants from the Cape Coast Metropolitan Area who were fluent in English, Twi, and Fante were trained to assist in data collection. Utilizing local research assistants minimized error that could arise in finding the appropriate start location for each EA while also ensuring local customs of proper greeting and interaction were adhered to. I did not accompany research assistants during the field work process as the presence of a foreigner may provoke dishonest responses from study participants and thus yield biased results.

After surveys were completed they were screened for completeness and appropriateness of responses. Surveys that were not filled out to an acceptable standard were returned to

the research assistant to rerun. After data was entered into Excel it was also reviewed for accuracy before statistical analyses were carried out.

3.8 Statistical Methods

Data from the cross sectional questionnaire was first entered and cleaned in Microsoft Excel v. 12.0 before it was copied into Stata v. 11.1 for statistical analyses. Univariate analysis was carried out and variables were described and summarized using charts and tables created in Microsoft Word. Respondents who had tested for HIV within the past 12 months and received their results were considered positive for testing uptake, while those who had never been tested, been tested and never received their results, or been tested more than 12 months prior to survey administration were considered negative. Continuous variables such as age and income or total number of sexual partners were transformed into categorical variables for analysis while binary variables were coded "0" for participants that were unexposed and "1" for those exposed. From the literature (Wringe et al., 2008) sex was considered an a priori confounder and analysis was thus stratified by sex after being run on the entire population.

The presence or absence of association between the outcome of interest, HTC uptake, and independent variables for each sex was determined through bivariate analyses conducted using cross tabulation and chi-square tests. Simple logistic regression was then used to determine the magnitude of the association between each of the independent variables and the dependent variable of interest. Variables that maintained an association with the outcome were included in the final multivariate logistic regression models. Two models

were built to identify factors that were associated with HTC uptake among males and females independently. Tables and charts were created to summarize the results of these analyses using Microsoft Word and Microsoft Excel.

3.9 Ethical Considerations

Ethical clearance for this study was sought from the Ethical Review Committee of Ghana Health Services, Research and Development Division, Accra. Clearance was also sought from the Cape Coast Metropolitan Health Director.

There were no known risks or benefits of study participation, however, as the subject of the study could be considered controversial or taboo, a consent form detailing the nature and purpose of the study was provided for each participant. Written consent (or fingerprint) was required before the questionnaire was administered. Individuals under the age of 18 were required to obtain consent from one or both of their parents/guardians before participation was permitted. Confidentiality of all study participants was maintained as consent forms have been stored separate of the survey responses.

Data entry was completed by the Principal Investigator and stored on a password-protected computer that only the Principal Investigator has access to. Physical copies of the surveys collected will be stored in a locked filing cabinet and kept for one year after the date of collection. Questions, comments, and concerns were directed to the Administrator of Ghana Health Services Ethical Review Committee.

3.10 Pretest

A pretest of the questionnaire was carried out in Madina to identify issues with the questionnaire design. Madina was selected for convenience of location and ease of obtaining survey participants. After pretesting the questionnaire, necessary corrections were made to ensure quality results in the study.

CHAPTER FOUR

4.0 Results

4.1 Study Population

The required sample size (stratified by sex) calculated for a representative study of HTC uptake among individuals aged 15-49 in the Cape Coast Metropolitan Area was 216: 144 females and 72 males distributed by population proportion among 12 enumeration areas: six from Cape Coast North and six from Cape Coast South. A total of 224 individuals were actually interviewed for this study; one male participant was excluded because he was 58 years of age, one participant was excluded because his or her sex was not identified on the questionnaire, and one male and one female were excluded because the primary outcome of interest, HIV testing uptake within the past 12 months, was not captured. The final sample size used for analysis was 220, with a total of 145 (65.91%) females and 75 (34.09%) males. These results are summarized below in Table 3.

Table 3. Sample size results

Enumeration Area	Sex	Required	Inter-viewed	Excluded	% Sample Size Met	Exclusion Reason
202302007	Male	8	8	0	100	
	Female	16	16	0	100	
202302051	Male	19	20	1	100	Age of individual does not meet study criteria
	Female	37	37	0	100	
202302066	Male	5	6		120	
			+1	1*		Sex of individual
	Female	10	11		110	not recorded
202302037	Male	6	6	0	100	
	Female	11	11	0	100	
202302081	Male	2	2	0	100	
	Female	5	5	0	100	
202302022**	Male	1	0	0	0	
	Female	1	0	0	0	
202301008	Male	9	10	0	111	
	Female	17	17	0	100	
202301093	Male	5	5	1	80	HTC uptake status undetermined
	Female	10	11	0	110	
202301076	Male	3	3	0	100	
	Female	6	6	0	100	
202301042	Male	6	7	0	117	
	Female	12	12	0	100	
202301025	Male	7	7	0	100	
	Female	15	15	1	93.3	HTC uptake status undetermined
202301059	Male	3	3	0	100	
	Female	5	5	0	100	
Total	Male	74	77	2	101	
	Female	145	146	1	100	

*Sex of excluded respondent not recorded therefore it is not represented in the % inclusion rates for the sample

**Enumeration area 202302022 was excluded from the study because of a negligible sample size

4.2 Testing Uptake within the Study Population

Overall, 103 (46.82%) individuals of the 220 interviewed had been tested for HIV at some point in their life, 101 (45.91%) had tested and received their results, and 66 (30%) had tested and received their results within the past 12 months. Of the 145 women surveyed, 73 (50.34%) women had tested and received the results and one had tested but failed to receive the results. Of these 74 tested, 48 (33.1%) had tested within the past 12 months and received their results. Of the 75 men surveyed, 28 (37.33%) had tested and received their results while one had been tested but failed to receive the results. Of these 28, 18 (24.0%) had tested and received their results within the past 12 months.

4.3 Socio-Demographic Characteristics of the Study Population

The mean age of those participating in the study was 28.1 ±7.9 years. The majority of participants were Christians (86.82%), of Fanti descent (70%), and living in an urban community (n=172 or 78.18%). The study population was largely educated with 82 (37.27%) individuals attending at least some tertiary school and an additional 70 (31.82%) attending at least some senior high school (SHS). Just eight participants (3.64%) had no formal education. As expected from these results, a large percentage of the population was currently enrolled as students (n=77; 35%) and had no weekly income (n=113, 52.31%).

Testing uptake was highest among individuals aged 25-29, those who were married, Ashanti, Christian, and those working as civil servants in the male and female

populations. The distribution of HTC uptake within the past 12 months among male and females participants with regard to these socio-demographic factors is shown below in Table 4a and Table 4b.

In these tables it can also be seen that ethnicity was the only socio-demographic factor seen to have a direct correlation with HTC uptake among males ($p=0.049$) in the chi-squared analysis. Seventy-five percent of male Ashantis participating in the study had tested within the past twelve months and received their status while just 25% of male Fantes and 0% of male Twis had done so.

Among females, however, testing uptake was found to be associated with age category ($p=0.019$), occupation ($p<0.001$), education ($p=0.043$), and marital status ($p<0.001$). It was seen more participants aged 25-29 (46.3%) and 30-39 (41.9%) had tested than those aged 40-49 (35.3%) or 15-24 (6.3%). Females that had completed at least some tertiary school were most likely to test (45.3%), as opposed to those that had no education, had only completed some primary school, JHS, or SHS. More individuals that were married (62.8%) or living together (50.0%) had tested in the past 12 months than those who were single (14.3%). Seventy-five percent of female civil servants had tested while just 12.0% of students, 35.6% of traders and 28.6% of the unemployed had done so. These results are also summarized in Tables 4a and 4b below.

Table 4a. Distribution of HTC uptake among males with regard to socio-demographic factors

	Males Tested (%) (n=18)	Not Tested (%) (n=57)	Total (%) (n=75)	p-Value
Age				
15-19	1 (16.7)	5 (83.3)	6 (8.0)	
20-24	4 (15.4)	22 (84.6)	26 (34.7)	
25-29	6 (35.3)	11 (64.7)	17 (22.7)	
30-39	4 (26.7)	11 (73.3)	15 (20.0)	p=0.636
40-49	3 (27.3)	8 (72.7)	11 (14.7)	
Missing	0 (0)	0 (0)	0 (0)	
Education				
No Education	0 (0)	2 (100)	2 (2.7)	
Primary	0 (0)	3 (100)	3 (4.0)	
JHS	6 (31.6)	13 (68.4)	19 (25.3)	p=0.372
SHS	3 (13.6)	19 (86.4)	22 (29.3)	
Tertiary	9 (31.0)	20 (69.0)	29 (38.7)	
Missing	0 (0)	0 (0)	0 (0)	
Marital Status				
Never Married	12 (24.0)	38 (76.0)	50 (66.7)	
Married	5 (29.4)	12 (70.6)	17 (22.7)	
Living Together	1 (16.7)	5 (83.3)	6 (8.0)	p=0.782
Divorced/ Separated	0 (0)	2 (100)	2 (2.7)	
Missing	0 (0)	0 (0)	0 (0)	
Ethnicity				
Fante	13 (25.0)	39 (75.0)	52 (69.3)	
Twi	0 (0)	3 (100)	3 (4.0)	
Ashanti	3 (75.0)	1 (25.0)	4 (5.3)	p=0.049*
Other	2 (12.5)	14 (87.5)	16 (21.3)	
Missing	0 (0)	0 (0)	0 (0)	
Religion				
Christian	16 (25.8)	46 (74.2)	62 (82.7)	
Muslim	2 (15.4)	11 (84.6)	13 (17.3)	p=0.424
Missing	0 (0)	0 (0)	0 (0)	
Occupation				
Trader	0 (0)	1 (100)	1 (1.3)	
Student	6 (22.2)	21 (77.8)	27 (36.0)	
Civil Servant	5 (55.6)	4 (44.4)	9 (12.0)	p=0.111
Unemployed	0 (0)	7 (100)	7 (9.3)	
Other	7 (22.6)	24 (77.4)	31 (41.3)	
Missing	0 (0)	0 (0)	0 (0)	
Income				
None	8 (20.5)	31 (79.5)	39 (52.0)	
GHC 1-49	2 (16.7)	10 (83.3)	12 (16.0)	
GHC 50-99	5 (33.3)	10 (66.7)	15 (20.0)	p=0.452
GHC ≥ 100	3 (42.9)	4 (57.1)	7 (9.3)	
Missing	0 (0)	2 (100)	2 (2.7)	
Location				
Urban	17 (28.8)	42 (71.2)	59 (78.7)	
Rural	1 (6.3)	15 (93.7)	16 (21.3)	p=0.061
Missing	0 (0)	0 (0)	0 (0)	
Total	18 (24.0)	57 (76.0)	75 (100)	

• denotes significance from chi-squared analysis

Table 4b. Distribution of HTC uptake among females with regard to socio-demographic factors

	Females Tested (%) (n=48)	Not Tested (%) (n=97)	Total (%) (n=145)	p-Value
Age				
15-19	1 (6.3)	15 (93.7)	16 (11.0)	
20-24	8 (21.6)	29 (78.4)	37 (25.5)	
25-29	19 (46.3)	22 (53.7)	41 (28.3)	
30-39	13 (41.9)	18 (58.1)	31 (21.4)	p=0.019*
40-49	6 (35.3)	11 (64.7)	16 (11.0)	
Missing	1 (33.3)	2 (66.7)	3 (2.1)	
Education				
No Education	2 (33.3)	4 (66.7)	6 (4.1)	
Primary	5 (41.7)	7 (58.3)	12 (8.3)	
JHS	9 (34.6)	17 (65.4)	26 (17.9)	p=0.043*
SHS	8 (16.7)	40 (83.3)	48 (33.1)	
Tertiary	24 (45.3)	29 (54.7)	53 (36.6)	
Missing	0 (0)	0 (0)	0 (0)	
Marital Status				
Never Married	11 (14.3)	66 (85.7)	77 (53.1)	
Married	27 (62.8)	16 (37.2)	43 (29.7)	
Living Together	10 (50.0)	10 (50.0)	20 (13.8)	p<0.001*
Divorced/ Separated	0 (0)	4 (100)	4 (2.8)	
Missing	0 (0)	1 (100)	1 (0.7)	
Ethnicity				
Fante	34 (33.3)	68 (66.7)	102 (70.3)	
Twi	5 (35.7)	9 (64.3)	14 (9.7)	
Ashanti	6 (50.0)	6 (50.0)	12 (8.3)	p=0.330
Other	3 (17.7)	14 (82.3)	17 (11.7)	
Missing	0 (0)	0 (0)	0 (0)	
Religion				
Christian	43 (33.3)	86 (66.7)	129 (89.0)	
Muslim	5 (31.3)	11 (68.7)	16 (11.0)	p=0.867
Missing	0 (0)	0 (0)	0 (0)	
Occupation				
Trader	16 (35.6)	29 (64.4)	45 (31.0)	
Student	6 (12.0)	44 (88.0)	50 (34.5)	
Civil Servant	6 (75.0)	2 (25.0)	8 (5.5)	p=0<0.001*
Unemployed	4 (28.6)	10 (71.4)	14 (9.7)	
Other	16 (57.1)	12 (42.9)	28 (19.3)	
Missing	0 (0)	0 (0)	0 (0)	
Income				
None	20 (27.0)	54 (73.0)	74 (51.0)	
GHC 1-49	10 (30.3)	23 (69.7)	33 (22.8)	
GHC 50-99	12 (48.0)	13 (52.0)	25 (17.2)	p=0.201
GHC ≥ 100	5 (45.5)	6 (54.5)	11 (7.6)	
Missing	1 (50.0)	1 (50.0)	2 (1.4)	
Location				
Urban	35 (31.0)	78 (69.0)	113 (77.9)	
Rural	13 (40.6)	19 (59.4)	32 (22.1)	p=0.306
Missing	0 (0)	0 (0)	0 (0)	
Total	48 (33.1)	97 (66.9)	145 (100)	

* denotes significance from chi-squared analysis

4.4 Lifestyle Factors

The primary lifestyle factors of interest in this study were related to sexual behavior. Of the 145 females and 75 males that were included in the analysis, one female (0.7%) and two males (2.7%) did not respond when asked their age at virginity loss and 24 females (16.6%) and 8 males (10.7%) reported never having sexual intercourse. The mean age of virginity loss among sexually active females (n=120) and males (n=65) who responded to this question was 19.39 ± 2.55 years and 18.95 ± 3.38 years respectively. When asked his or her total number of sexual partners in his or her lifetime, one female (0.7%) and three males (4.0%) did not respond and two females (1.4%) and one male (1.3%) did not know the answer to the question. Among the 118 reporting females and 63 reporting males, the average number of sexual partners throughout his or her lifetime was 3.11 ± 6.21 and 6.02 ± 7.81 respectively. When asked his or her number of sexual partners within the past twelve months, one female (0.7%) and three males (4.0%) did not respond, three (2.1%) females and two males (2.7%) did not know the answer to the question, and 32 females (22.1%) and 12 males (16.0%) had not had sex within the past 12 months. The average number of sexual partners within the past twelve months was 1.15 ± 0.43 partners among women (n=109) and 2.53 ± 3.10 partners among men (n=58).

Eleven individuals (5.9%) reported that the last time they had sexual intercourse it was with an acquaintance, one (0.5%) with an ex-girlfriend, two (1.1%) with a fiancée, 62 (33.0%) with a spouse and 110 (58.5%) with a boyfriend or girlfriend (two individuals did not respond). Ten individuals (5.3%) reported having paid or received money for

sexual intercourse in their lifetime, though all of these individuals reported using a condom every time they had paid or received money for sex.

Testing uptake was highest in individuals that had traveled away from home more than five times in the past year, those whose last sexual partner was their husband or wife, and those that felt they could not ask their partner to use a condom if he or she wanted them to in both the male and female populations. The distribution of HTC uptake within the past 12 months among male and females participants with regard to lifestyle factors is shown below in Table 5a and Table 5b.

In the chi-squared analysis assessing the relationship between lifestyle factors and HTC uptake within the past 12 months, travel history was the only variable seen to have a relationship ($p=0.002$) with uptake among men. Over 57% of male respondents who had traveled away from home more than 5 times within the past 12 months had tested while just 9.7% of those that had never traveled and19.2% of those that had traveled 1-4 times had done so.

Among women, testing uptake was associated with travel history ($p=0.027$), age at virginity loss ($p=0.009$), total number of lifetime sexual partners ($p=0.009$), relationship with last sexual partner ($p<0.001$), total number of partners in the past 12 months ($p=0.003$), and condom usage in the past 12 months ($p<0.001$). As was seen among male respondents, women who had traveled away from home more than five times within the past year were those whom had tested the most. The older a female respondent was at the

age of her virginity loss the more likely she was to have tested as well. Over 45% of females that had 2-3 lifetime sexual partners had tested while just 26.3% of those with four or more partners, 32.3% of those with one partner and 8.3% of virgins had tested. Females who were married to their last sexual partner were most likely to have tested (62.2%) while just 24.3% of those who had last slept with a boyfriend had done so. A greater percentage of females that had not used a condom every time they had sexual intercourse in the past twelve months had tested (55.3%) than those that had always used a condom (8.3%). However, those whom had just had one sexual partner in the past year were more likely to have tested than those who had 2 or more partners or had not been with anyone. These results can also be seen below in Tables 5a and 5b.

Table 5a. Distribution of HTC uptake among males with regard to lifestyle factors

	Males Tested (%) **	Not Tested (%) **	Total (%) **	p-Value
Travel History				
0	3 (9.7)	28 (90.3)	31 (41.3)	
1-4	5 (19.2)	21 (80.8)	26 (34.7)	p=0.002*
>5	8 (57.1)	6 (42.9)	14 (18.7)	
Missing	2 (50)	2 (50.0)	4 (5.3)	
Radio				
Everyday	9 (20.9)	34 (79.1)	43 (57.3)	
At least once a week	8 (32.0)	17 (68.0)	25 (33.3)	
< Once a Week	1 (20.0)	4 (80.0)	5 (6.7)	p=0.620
No t at all	0 (0)	2 (100)	2 (2.7)	
Missing	0 (0)	0 (0)	0 (0)	
TV				
Everyday	12 (26.7)	33 (73.3)	45 (60.0)	
At least once a week	4 (17.4)	19 (82.6)	23 (30.7)	
< Once a Week	2 (33.3)	4 (66.7)	6 (8.0)	p=0.722
Not at all	0 (0)	1 (100)	1 (1.3)	
Missing	0 (0)	0 (0)	0 (0)	
Spouse of Live-in Partner with Other Partners				
No	2 (12.5)	14 (87.5)	16 (69.6)	
Yes	2 (66.7)	1 (33.3)	3 (13.0)	p=0.071
Don't Know	2 (50.0)	2 (50)	4 (17.4)	
Missing	0 (0)	0 (0)	0 (0)	
Age of Virginity Loss				
Virgin	2 (25.0)	6 (75.0)	8 (10.7)	
<18	7 (36.8)	12 (63.2)	19 (25.3)	
18-20	5 (16.1)	26 (83.9)	31 (41.3)	p=0.429
>20	4 (26.7)	11 (73.3)	15 (20.0)	
Missing	0 (0)	2 (100)	2 (2.7)	
Total Number of Lifetime Partners				
0	2 (25.0)	6 (75.0)	8 (10.7)	
1	1 (11.1)	8 (78.9)	9 (12.0)	
2-3	5 (25.0)	15 (75.0)	20 (26.7)	
4+	10 (29.4)	24 (70.6)	34 (45.3)	p=0.738
Doesn't know	0 (0)	1 (100)	1 (1.3)	
Missing	0 (0)	3 (100)	3 (4.0)	
Relationship with Last Sexual Partner				
Wife/Husband	5 (29.4)	12 (70.6)	17 (25.4)	
Girl/Boyfriend	9 (22.5)	31 (77.5)	40 (59.7)	p=0.846
Other	2 (22.2)	7 (77.8)	9 (13.4)	
Missing	0 (0)	1 (100)	1 (1.5)	

* denotes significance from chi-squared analysis

**Column sample sizes "n" not included as "n" varies across independent variables

	Males Tested (%) **	Not Tested (%) **	Total (%) **	p-Value
Total Number of Partners in Past 12 Months				
0	2 (16.7)	10 (83.3)	12 (16.0)	
1	6 (18.7)	26 (81.3)	32 (42.7)	
2+	10 (38.5)	16 (61.5)	26 (34.7)	p=0.170
Doesn't know	0 (0)	2 (100)	2 (2.7)	
Missing	0 (0)	3 (100)	3 (4.0)	
Did you use a condom every time you had sexual intercourse in the last 12 months?				
No	7 (24.1)	22 (75.9)	29 (46.8)	
Yes	9 (27.3)	24 (72.7)	33 (53.2)	p=0.778
Missing	0 (0)	0 (0)	0 (0)	
Have you ever paid anyone or gotten paid in exchange for having sexual intercourse?				
No	14 (23.0)	47 (77.0)	61 (91.0)	
Yes	2 (40.0)	3 (60.0)	5 (7.5)	p=0.392
Missing	0 (0)	1 (100)	1 (1.5)	
Can you say no to your partner if you do not want to have sexual intercourse?				
No	3 (37.5)	5 (62.5)	8 (34.78)	
Yes	3 (20.0)	12 (80.0)	15 (65.22)	p=0.363
Missing	0 (0)	0 (0)	0 (0)	
Can you ask your partner to use a condom if you wanted him/her to?				
No	3 (30.0)	7 (70.0)	10 (43.5)	p=0.793
Yes	3 (25.0)	9 (75.0)	12 (52.2)	
Missing	0 (0)	1 (100)	1 (4.3)	

* denotes significance from chi-squared analysis

**Column sample sizes "n" not included as "n" varies across independent variables

Table 5b. Distribution of HTC uptake among females with regard to lifestyle factors

	Females Tested (%) **	Not Tested (%) **	Total (%) **	p-Value
Travel History				
0	14 (22.2)	49 (77.8)	63 (43.4)	
1-4	13 (33.3)	26 (66.7)	39 (26.9)	p=0.027*
>5	17 (48.6)	18 (51.4)	35 (24.1)	
Missing	4 (50.0)	4 (50.0)	8 (5.5)	
Radio				
Everyday	19 (28.8)	47 (71.2)	66 (45.5)	
At least once a week	17 (33.3)	34 (66.7)	51 (35.2)	
< Once a Week	7 (35.0)	13 (65.0)	20 (13.8)	p=0.294
Not at all	5 (62.5)	3 (37.5)	8 (5.5)	
Missing	0 (0)	0 (0)	0 (0)	
TV				
Everyday	37 (36.3)	65 (63.7)	102 (70.3)	
At least once a week	6 (19.4)	25 (80.6)	31 (21.3)	
< Once a Week	3 (33.3)	6 (66.7)	9 (6.2)	p=0.201
Not at all	2 (66.7)	1 (33.3)	3 (2.1)	
Missing	0 (0)	0 (0)	0 (0)	
Spouse or Live-in Partner with Other Partners				
No	28 (68.3)	13 (31.7)	41 (65.1)	
Yes	5 (55.6)	4 (44.4)	9 (14.3)	p=0.056
Don't Know	4 (30.8)	9 (69.2)	13 (20.6)	
Missing	(0)	(0)	(0)	
Age of Virginity Loss				
Virgin	2 (8.3)	22 (91.7)	24 (16.6)	
<18	7 (33.3)	14 (66.7)	21 (14.5)	
18-20	26 (34.7)	49 (65.3)	75 (51.7)	p=0.009*
>20	13 (54.2)	11 (45.8)	24 (16.6)	
Missing	0 (0)	1 (100)	1 (0.7)	
Total Number of Lifetime Partners				
0	2 (8.3)	22 (91.7)	24 (16.7)	
1	10 (32.3)	21 (67.7)	31 (21.5)	
2-3	31 (45.6)	37 (54.4)	68 (46.5)	
4+	5 (26.3)	14 (73.7)	19 (13.2)	p=0.009*
Doesn't know	0 (0)	2 (100)	2 (1.4)	
Missing	0 (0)	1 (100)	1 (0.7)	
Relationship with Last Sexual Partner				
Wife/Husband	28 (62.2)	17 (37.8)	45 (37.2)	
Girl/Boyfriend	17 (24.3)	53 (75.7)	70 (57.9)	p<0.001*
Other	1 (20.0)	4 (80.0)	5 (4.1)	
Missing	0 (0)	1 (100)	1 (0.8)	

* denotes significance from chi-squared analysis

**Column sample sizes "n" not included as "n" varies across independent variables

	Females Tested (%) **	Not Tested (%) **	Total (%) **	p-Value
Total Number of Partners in Past 12 Months				
0	3 (9.4)	29 (90.6)	32 (22.1)	
1	40 (42.1)	55 (57.9)	95 (65.5)	
2+	4 (28.6)	10 (71.4)	14 (9.7)	p=0.003*
Doesn't know	1 (33.3)	2 (66.7)	3 (2.1)	
Missing	0 (0)	1 (100)	1 (0.7)	
Did you use a condom every time you had sexual intercourse in the last 12 months?				
No	42 (55.3)	34 (44.7)	76 (67.3)	
Yes	3 (8.3)	33 (91.7)	36 (31.9)	p<0.001*
Missing	0 (0)	1 (100)	1 (0.9)	
Have you ever paid anyone or gotten paid in exchange for having sexual intercourse?				
No	45 (39.5)	69 (60.5)	114 (94.2)	
Yes	1 (20.0)	4 (80.0)	5 (4.1)	p=0.381
Missing	0 (0)	2 (100)	2 (1.7)	
Can you say no to your partner if you do not want to have sexual intercourse?				
No	7 (50.0)	7 (50.0)	14 (21.9)	
Yes	30 (60.0)	20 (40.0)	50 (78.1)	p=0.503
Missing	0 (0)	0 (0)	0 (0)	
Can you ask your partner to use a condom if you wanted him/her to?				
No	19 (70.4)	8 (29.6)	27 (42.2)	
Yes	17 (47.2)	19 (52.8)	36 (56.3)	p=0.066
Missing	1 (100)	0 (0)	1 (1.6)	

* denotes significance from chi-squared analysis

**Column sample sizes "n" not included as "n" varies across independent variables

4.5 Knowledge and attitudes towards HIV and HTC

Four individuals (1.82%) in this study had not heard of HIV and AIDS. When the remaining 216 participants were asked if they could reduce their chances of contracting the infection by having one uninfected partner with no additional partners, 20 individuals (9.26%) believed this statement was false. In addition to this, an alarming 95 respondents (43.98%) stated that they would not buy vegetables from someone with HIV or AIDS if they were aware of the individual's status. While 41 individuals (18.98%) knew someone who had suffered from HIV or AIDS, just 19 (8.80%) reported knowing an individual that was currently on treatment for the infection.

When asked about their knowledge of location of testing and counseling services, of the 216 participants that had heard of HIV, one female (0.7%) did not respond and 10 females (6.99%) and one male (1.37%) reported that they did not know a single place where they could access testing and counseling. Among the 204 individuals that could name a service location, government hospitals were the most well known (n=179, 87.75%) followed by family planning clinics (n=24, 11.76%). Thirty-one individuals (14.35% of those who had heard of HIV/AIDS) could name at least two testing locations.

To gauge participants' perceptions about HTC services they were asked a series of questions regarding whether or not HTC could lead to various outcomes. The responses to these questions for both men and women can be seen in Figure 5 and Figure 6 below.

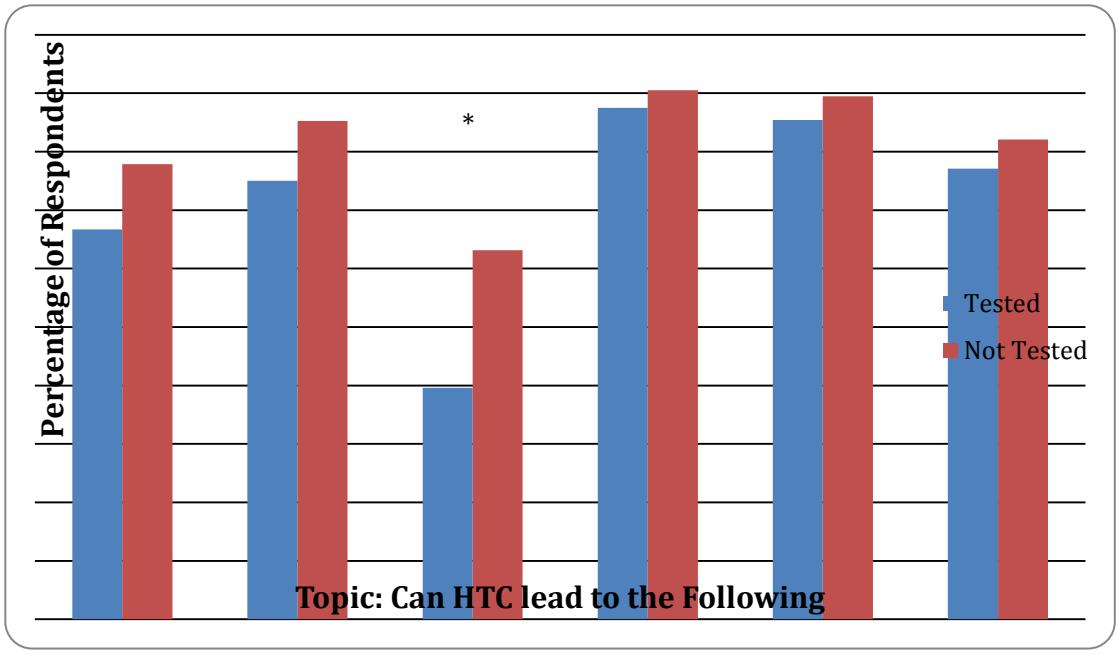


Figure 5a. Female respondents' perceptions of HTC by uptake status in the past 12 months

*indicates significance at p<0.05

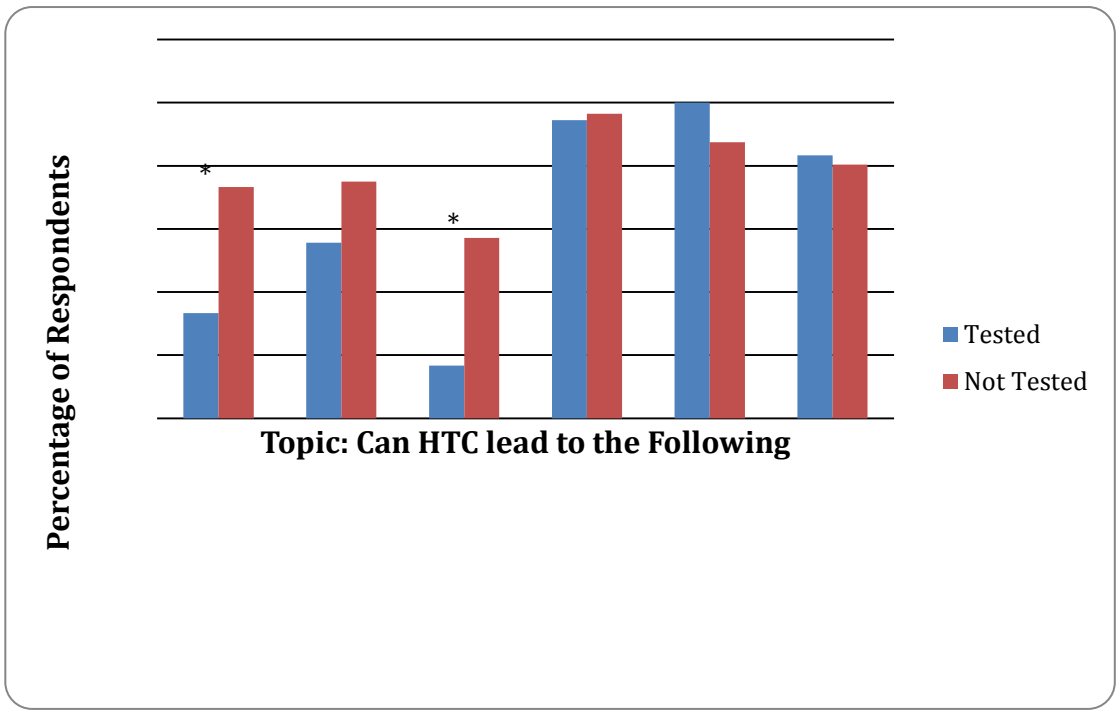


Figure 5b. Male respondents' perceptions of HTC by uptake status in the past 12 months

* indicates significance at p<0.05

Individuals were also asked if their family and friends would still accept them if they were tested for HIV. Thirty-four individuals (15.75% of those who had heard of HIV/AIDS) reported that no, their friends and families would not accept them if they were tested.

Testing uptake was highest among both males and females that believed they could reduce their chance of getting HIV by having one uninfected sex partner with no other sex partners, would buy vegetables from someone even if they knew the individual was living with HIV/AIDS, knew someone living with HIV/AIDS or on treatment for the infection, did not believe testing could lead to more severe sickness, depression, or early death, and felt their friends and family would still accept them if they tested. These results are summarized in Tables 6a and 6b below.

From these tables it can also be seen that testing uptake within the past 12 months was seen to have an association with the belief that testing uptake could lead to an early death ($p=0.003$) or cause more severe sickness ($p=0.002$) among male respondents. Just 12.8% of males that believed testing for HIV could lead to more severe sickness and 8.8% of those that believed it could lead to an early death had actually been tested while 46.1% and 38.5% of those that did not hold these belief respectively had done so. Among female respondents, uptake was only found to be associated with the belief that testing uptake could lead to an early death ($p=0.007$). Just 24.1% of females that believed testing could lead to an early death had tested within the past year while 45.9% of those that did not hold this believe had tested.

Table 6a. Distribution of HTC uptake among males with regard to knowledge and perceptions of HIV and HTC

	Males Tested (%) (n=18)	Not Tested (%) (n=55)	Total (%) (n=73)	p-Value
Can people reduce their chance of getting HIV by having one uninfected sex partner who has no other sex partners?				
No	1 (14.3)	6 (85.7)	7 (9.6)	
Yes	17 (25.8)	49 (74.2)	66 (90.4)	p=0.503
Missing	0 (0)	0 (0)	0 (0)	
Would you buy fresh vegetables from someone with HIV/AIDS?				
No	5 (16.7)	25 (83.3)	30 (41.1)	
Yes	13 (30.2)	30 (69.8)	43 (58.9)	p=0.186
Missing	0 (0)	0 (0)	0 (0)	
Do you know anyone with HIV/AIDS?				
No	11 (21.6)	40 (78.4)	51 (69.9)	
Yes	6 (30.0)	14 (70.0)	20 (27.4)	p=0.454
Missing	1 (50.0)	1 (50.0)	2 (2.7)	
Do you know anyone currently on treatment for HIV/AIDS?				
No	3 (21.4)	11 (78.6)	14 (63.6)	
Yes	4 (50.0)	4 (50.0)	8 (36.4)	p=0.166
Missing	0 (0)	0 (0)	0 (0)	
Can getting tested for HIV cause more severe sickness?				
No	12 (46.1)	14 (53.9)	26 (35.6)	
Yes	6 (12.8)	41 (87.2)	47 (64.4)	p=0.002*
Missing	0 (0)	0 (0)	0 (0)	
Can getting tested for HIV cause depression?				
No	8 (36.4)	14 (63.6)	22 (30.1)	
Yes	10 (19.6)	41 (80.4)	51 (69.9)	p=0.127
Missing	0 (0)	0 (0)	0 (0)	
Can getting tested for HIV cause early death?				
No	15 (38.5)	24 (61.5)	39 (53.4)	
Yes	3 (8.8)	31 (91.2)	34 (46.6)	p=0.003*
Missing	0 (0)	0 (0)	0 (0)	
Can getting tested for HIV lead to treatment?				
No	1 (33.3)	2 (66.7)	3 (4.1)	
Yes	17 (24.3)	53 (75.7)	70 (95.9)	p=0.722
Missing	0 (0)	0 (0)	0 (0)	
Can getting tested for HIV lead to prolonged life?				
No	0 (0)	6 (100)	6 (9.2)	
Yes	18 (26.9)	49 (73.1)	67 (91.8)	p=0.144
Missing	0 (0)	0 (0)	0 (0)	
Can getting tested for HIV lead to improved quality of life?				
No	3 (23.1)	10 (76.9)	13 (17.8)	
Yes	15 (25.0)	45 (75.0)	60 (82.2)	p=0.884
Missing	0 (0)	0 (0)	0 (0)	
If you were tested for HIV would your friends and family still accept you?				
No	3 (18.8)	13 (81.2)	16 (21.9)	
Yes	14 (26.4)	39 (73.6)	53 (72.6)	p=0.533
Missing	1 (25.0)	3 (75.0)	4 (5.5)	
Total	18 (24.7)	55 (75.3)	73 (100)	

*denotes significance from chi-squared analysis

Table 6b. Distribution of HTC uptake among females with regard to knowledge and perceptions of HIV and HTC

	Females Tested (%) (n=48)	Not Tested (%) (n=95)	Total (%)(n=143)	P-Value
Can people reduce their chance of getting HIV by having one uninfected sex partner who has no other sex partners?				
No	4 (30.8)	9 (69.2)	13 (9.1)	
Yes	43 (33.9)	84 (66.1)	127 (88.8)	p=0.822
Missing	1 (33.3)	2 (66.7)	3 (2.1)	
Would you buy fresh vegetables from someone with HIV/AIDS?				
No	19 (29.2)	46 (70.8)	65 (45.5)	
Yes	28 (36.8)	48 (63.2)	76 (53.1)	p=0.339
Missing	1 (50.0)	1 (50.0)	2 (1.4)	
Do you know anyone with HIV/AIDS?				
No	39 (32.0)	83 (68.0)	122 (85.3)	
Yes	9 (42.9)	12 (57.1)	21 (14.7)	p=0.329
Missing	0 (0)	0 (0)	0 (0)	
Do you know anyone currently on treatment for HIV/AIDS?				
No	4 (40.0)	6 (60.0)	10 (47.6)	
Yes	5 (45.5)	6 (54.5)	11 (52.4)	p=0.166
Missing	0 (0)	0 (0)	0 (0)	
Can getting tested for HIV cause more severe sickness?				
No	16 (45.7)	19 (54.3)	35 (24.5)	
Yes	32 (30.2)	74 (69.8)	106 (74.1)	p=0.093
Missing	0 (0)	2 (100)	2 (1.4)	
Can getting tested for HIV cause depression?				
No	12 (50.0)	12 (50.0)	24 (16.8)	
Yes	36 (30.8)	81 (69.2)	117 (81.8)	p=0.070
Missing	0 (0)	2 (100)	2 (1.4)	
Can getting tested for HIV cause early death?				
No	28 (45.9)	33 (54.1)	61 (42.7)	
Yes	19 (24.1)	60 (75.9)	79 (55.2)	p=0.007*
Missing	1 (33.3)	2 (66.7)	3 (2.1)	
Can getting tested for HIV lead to treatment?				
No	6 (54.6)	5 (45.4)	11 (7.7)	
Yes	42 (32.8)	86 (67.2)	128 (89.5)	p=0.146
Missing	0 (0)	4 (100)	4 (2.8)	
Can getting tested for HIV lead to prolonged life?				
No	7 (53.8)	6 (46.2)	13 (9.1)	
Yes	41 (32.5)	85 (67.5)	126 (88.1)	p=0.124
Missing	0 (0)	4 (100)	4 (2.8)	
Can getting tested for HIV lead to improved quality of life?				
No	11 (45.8)	13 (54.2)	24 (16.8)	
Yes	37 (32.2)	78 (67.8)	115 (80.4)	p=0.201
Missing	0 (0)	4 (100)	4 (2.8)	
If you were tested for HIV would your friends and family still accept you?				
No	3 (16.7)	15 (83.3)	18 (12.6)	
Yes	44 (38.3)	71 (61.7)	115 (80.4)	p=0.075
Missing	1 (10.0)	9 (90.0)	10 (7.0)	
Total	48 (33.6)	95 (66.4)	143 (100)	

***** denotes significance from chi-squared analysis

4.6 Health Service Factors

The longest travel time reported when asked how long it would take to get to the nearest HTC facility was 2 hours. The median time to a testing location was 20 minutes with the shortest time reported as 3 minutes. The highest cost reported when asked how much it would be to travel to the nearest HTC facility was GHC 10 while several individuals were within walking distance of a testing site. The median cost of travel was GHC 0.95.

The median wait time individuals reported for testing at the HTC facility was ten minutes (range of one minute to one day). Receiving the results of the HIV test took a median of 20 minutes longer (range of two minutes to two months).

Just four individuals (3.88%) who accessed testing and counseling services (n=103) expressed that the staff of HTC sites were not friendly and helpful to clients. Twenty-four individuals (23.3%) reported that others were present during the administration of their HIV test: seven (6.80%) being accompanied by an immediate family member, eight (7.77%) by a friend or colleague, four (3.9%) by fellow students, one (0.97%) by a cousin, one (0.97%) by a health worker, one (0.97%) by other patients and one (0.97%) by another blood donor. One individual did not specify who was present during her test. Two (1.94%) individuals expressed concerns about the confidentiality of their results.

Figure 6 shown below details the testing locations utilized by both men and women who reported testing. "Other" testing locations included public school based clinics, mobile fieldworkers or clinics, private hospitals or clinics and other government health centers.

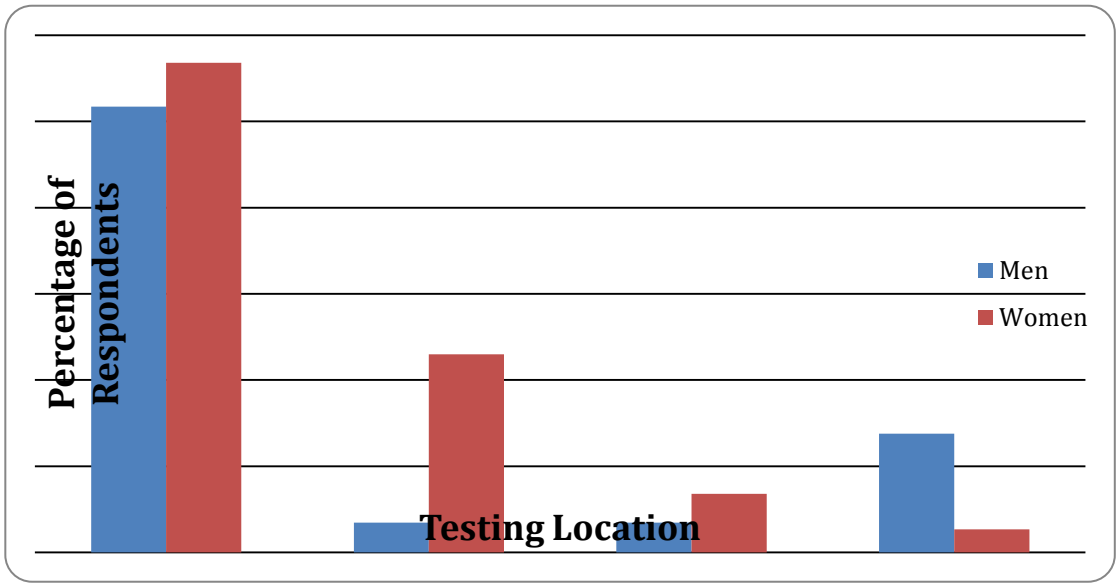


Figure 6. Testing location of respondents

4.7 Self-Reported Reasons for Testing Uptake/Non-Uptake

Among the 74 respondents that had tested for HIV, 44 (59.46%) listed antenatal care as their reason for uptake of services while 20 (27.03%) listed personal desire to know their status. Other reasons included doctor's recommendation, blood donation, father's request, and school requirements or initiatives. Among the 29 males that had tested for HIV, 17 (58.62%) listed their reason as personal desire to know their status while four (13.79%) were tested as a requirement for blood donation, and three (10.34%) as a job requirement. Other reasons included doctor's recommendation and school initiatives.

Of the 68 women and 44 men that had heard of HIV yet reported never having tested, fear of stigma, the test results, depression, and their spouse's response, were the top

reasons given for never having tested among both sexes. In addition to these reasons for never having tested, 36.4% (n=16) of males and 25% (n=17) of females that had not tested also reported that they did not feel they were at risk of contracting HIV. Nine males (20.5%) and four females (5.6%) stated they saw no benefit of being tested for HIV. In the chi-squared analysis, this was the only variable in which a significant difference (p=0.016) was observed between sexes. Other reasons given for never having tested included fear of parents' reaction, no desire to test, no reason to test, and no desire to know their HIV status. These results are outlined further in Figure 7 below.

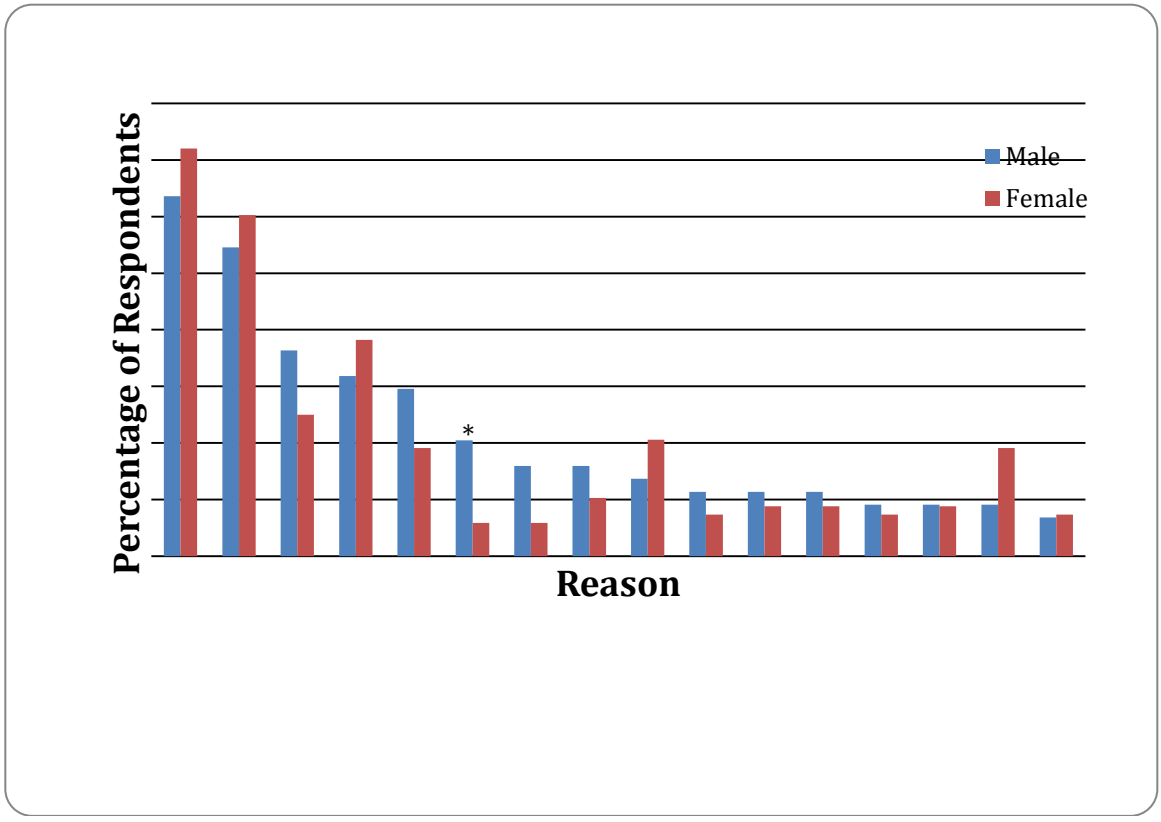


Figure 7. Respondents' reasons for not testing
*indicates significance at p<0.05

4.8 Factors Associated with HTC Uptake in the Crude Analysis

From the cross tabulation and chi-squared analysis, testing uptake was found to be associated with ethnicity, travel history, and the idea that being tested for HIV can lead to more severe sickness or an early death among male respondents as mentioned above and seen in Tables 4a, 5a and 6a. Among females, an association was seen between age category, occupation, education, marital status, travel history, age of virginity loss, total number of lifetime sexual partners, total number of sexual partners within the past year, relationship with last sexual partner, whether or not a condom was used during intercourse at all points in the past 12 months, and the idea that testing for HIV can lead to early death as mentioned and seen in Tables 4b, 5b and 6b.

When this analysis was carried out for the population as a whole, uptake was found to be associated with the idea that HTC can lead to early death ($p<0.001$), depression ($p=0.036$), and more severe sickness ($p=0.003$), whether or not a condom was used during sexual intercourse at all points in the past 12 months ($p<0.001$), the total number of sexual partners an individual had throughout their lifetime ($p=0.023$), the total number of sexual partners an individual had within the past 12 months ($p=0.007$), the relationship an individual had with his or her last sexual partner ($p<0.001$), age of virginity loss ($p=0.036$), travel history ($p<0.001$), occupation ($p<0.001$), education ($p=0.023$), ethnicity ($p=0.033$), marital status ($p<0.001$), and age category ($p=0.007$).

Simple logistic regression was carried out to determine the magnitude of association between these independent variables and the outcome of interest for the entire study

population, just males, and just females. Ethnicity in the male population was the only variable seen to have an association with the outcome of interest in the chi-squared analysis that did not maintain significance in the simple logistic regression analysis (p=0.0513). Unadjusted odds ratios were recorded in Table 7 and Table 8 below for all other variables seen to have an association with the outcome of interest in the crude analysis for each sex. These variables were then maintained in the final logistic regression models.

4.9 Factors Associated with HTC Uptake in Adjusted Analysis

The adjusted odds ratios for factors associated with HTC uptake over the past 12 months among male participants show a significant correlation between travel history and the idea that HTC uptake can lead to early death or more severe sickness. In Table 7 below it can be seen that males who reported being away from home five or more times within the past 12 months for work or travel were 12.44 (1.83, 91.24) times more likely to be tested for HIV in the past year than individuals that had not been away from home at all. Individuals that believed HTC uptake could lead to an early death were 90% (aOR=0.1029, 95% CI= 0.01, 0.72) less likely to have been tested in the past 12 months than those who did not hold this belief. Though in the crude analysis it was observed that male individuals who believed testing could lead to more severe sickness were less likely to have tested in the past 12 months, there was not a significant correlation in the adjusted analysis.

Table 7. Logistic regression of factors associated with HTC uptake among males

	Males (n=76)			
	OR	**95% CI**	**aOR**	**95%CI**
Travel History				
0	1	-	1	-
1-4	2.1212	(0.4564, 9.8592)	2.2260	(0.4329, 11.4469)
>5	12.4444	(2.5298, 61.2166)	12.9377	(1.8346, 91.2392)
Can getting tested for HIV lead to early death?				
No	1	-	1	
Yes	0.15	(0.0390, 0.5774)	0.1029	(0.0146, 0.7244)
Can getting tested for HIV lead to more severe sickness?				
No	1	-	1	-
Yes	0.1829	(0.0582, 0.5746)	0.7791	(0.1587, 3.8241)

From the analysis carried out among female participants an association was observed between HTC uptake and education, occupation, the total number of sexual partners the woman has had in the past 12 months, and the belief that testing uptake can lead to an early death. As seen in Table 8 below, females that only attended some secondary high school are 92% less likely to have tested and received their status within the past 12 months than those that attended some tertiary school. In addition to this, individuals that are not currently working as students, traders, or civil servants are 35 times more likely to have been tested than those currently attending school. Respondents with no sexual partners within the past 12 months were 98% less likely to have tested in the past year than those with one sexual partner and those that believed testing for HIV could lead to an early death were 75% less likely to have tested than those who did not hold this belief.

Though age, marital status, travel history, age at virginity loss, and total number of sexual partners in her lifetime were seen to have an association with testing uptake in the crude analysis, no significant relationship was observed in the adjusted analysis. It should also be noted that because the independent variables for relationship with last sexual partner

and condom use over the past 12 months were not applicable to all female participants, they were excluded from the final logistic regression model.

Table 8. Logistic regression of factors associated with HTC uptake among females

		Females (n=144)			
		OR	**95% CI**	**aOR**	**95%CI**
Age					
	15-19	0.0772	(0.0093, 0.6401)	1.3083	(0.0499, 34.304)
	20-24	0.3194	(0.1181, 0.8637)	0.7481	(0.1272, 4.3985)
	25-29	1	-	1	-
	30-39	0.8362	(0.3263, 2.1432)	0.4786	(0.0593, 3.8633)
	40-49	0.6316	(0.1962, 2.0326)	1.5886	(0.0719, 35.121)
Education					
	No Education	0.6042	(0.1017, 3.5879)	0.2259	(0.0046, 11.152)
	Primary	0.8631	(0.2427, 3.0694)	0.1917	(0.0079, 4.6419)
	JHS	0.6397	(0.2420, 1.6914)	0.1900	(0.0198, 1.8272)
	SHS	0.2417	(0.0952, 0.6138	0.0766	(0.0098, 0.5968)
	Tertiary	1	-	1	-
Marital Status					
	Never Married	1	-	1	-
	Married	10.125	(4.1633, 24.624)	6.4680	(0.5089, 82.206)
	Living Together	6	(2.0288, 17.744)	7.1203	(0.6343, 79.933)
	Divorced/ Separated	Predicts failure perfectly		Predicts failure perfectly	
Occupation					
	Trader	4.0460	(1.4175, 11.5488)	8.7399	(0.5897, 129.54)
	Student	1	-	1	-
	Civil Servant	22	(3.5881, 134.8915)	28.0799	(0.2635, 2992.4))
	Unemployed	2.9333	(0.6954, 12.3741)	1.7882	(0.1427, 22.415)
	Other	9.7778	(3.1434, 30.4142)	35.6887	(2.4680, 516.07)
Travel History					
	0	1	-	1	-
	1-4	1.75	(0.7171, 4.2709)	0.5308	(0.1041, 2.7063)
	>5	3.3056	(1.3574, 8.0498)	4.2161	(0.6554, 27.122)
Age of Virginity Loss					
	Virgin	0.9423	(0.3383, 2.6246)	3.5491	(0.2945, 42.776)
	<18	2.2273	(0.8760, 5.6631)	6.7746	(0.9476, 48.432)
	18-20	1	-	1	-
	>20	0.1713	(0.0373, 0.7862)	14.4081	(0.2677, 775.45)
Total Number of Lifetime Partners					
	0	0.1909	(0.0373, 0.9760)	**	
	1	1	-	1	-
	2-3	1.7595	(0.7214, 4.2910)	0.6734	(0.9476, 4.8706)
	4+	0.75	(0.2109, 2.6673)	0.4071	(0.0277, 5.9925)
Relationship with Last Sexual Partner					
	Wife/Husband	1	-	*	
	Girl/Boyfriend	0.1947	(0.0863, 0.4393)		
	Other	0.1518	(0.0156, 1.4731)		
Total Number of Partners in Past 12 Months					
	0	0.1422	(0.0405, 0.4997)	0.0250	(0.0010, 0.6195)
	1	1	-	1	-
	2-4	0.55	(0.1609, 1.8798)	0.1216	(0.0065, 2.2721)

*denotes variable excluded from final regression model due to lack of applicability to total study population

**denotes category excluded because of collinearity

	Females			
	OR	**95% CI**	**aOR**	**95% CI**
Did you use a condom every time you had sexual intercourse in the last 12 months?				
No	1	-	*	
Yes	0.0736	(0.0208, 0.2609)		
Can getting tested for HIV lead to early death?				
No	1	-	1	-
Yes	0.3732	(0.1812, 0.7675)	0.2480	(0.0653, 0.9412)

*denotes variable excluded from final regression model due to lack of applicability to total study population

**denotes category excluded because of collinearity

CHAPTER FIVE

5.0 Discussion

5.1 Testing Service Availability and Knowledge of Services

From this study it can be seen that HTC service availability is no longer a major factor influencing testing uptake in the study location. Within the Cape Coast Metropolitan Area there are at least 14 clinic-based testing facilities, most of which are public testing sites that can be accessed free of charge. From a direct comparison with the 2008 DHS, a higher number of individuals now know where to access these facilities or HTC services in general. Among females, 93.06% of individuals could name at least one HTC service facility while just 70.2% could do so in 2008. Among males, 98.68% of individuals could name at least one HTC service facility while just 75.2% could do so in 2008. These statistics indicate that the recent increase in HTC service facilities and the "Know Your Status Campaign" initiated in 2008 are, to some extent, having their desired effect.

The median cost of travel to the nearest testing site reported in this study was less than GHC 1. The median travel time to the site was 20 minutes, the median wait time at the clinic was just 10 minutes, and the median time to receive the test results was an additional 20 minutes. From this it can be gathered that an average individual living in the Cape Coast Metropolitan Area can leave their home, be tested for HIV, receive their results, and return home within one hour and 10 minutes at a cost of less than GHC 2. Conclusively, knowledge of HTC services is nearly comprehensive throughout the

population, and affordability and accessibility to the general population is greatly improved.

5.2 Overall Testing Uptake in the Cape Coast Metropolitan Area

In this study the level of HTC uptake in the Cape Coast Metropolitan Area and factors associated with the uptake of services for females, males and the population as a whole were assessed. In comparison to the Central Region results from the 2008 Ghana Demographic and Health Survey, HTC uptake in the area was much improved. Among women, 50.69% of individuals had been tested and received their results at some point in their lifetime and 33.33% had been tested and received their results within the past 12 months. In 2008, these numbers were 18.3% and 6.7% respectively within the Central Region. Among men, 36.84% of individuals had tested and received their results at some point in their lifetime and 23.68% had been tested and received their results within the past 12 months. In 2008, these numbers were 8.5% and 3.1% respectively within the Central Region (Ghana Statistical Service, 2009). While the progress to date is clear, further improvement is needed to eliminate the spread of the infection entirely.

5.3 Differences in Testing Uptake Among Males and Females

This study has shown that factors associated with the uptake of HTC services vary among males and females. From the adjusted analysis, socio-demographic factors (education, occupation, etc.), lifestyle factors (number of sexual partners, condom use, etc), fears concerning HIV (stigma, depression, etc), and knowledge and perceptions of HIV and

HTC (belief that HTC can lead to an early death) continue to influence HTC uptake among females. Among males, however, fears concerning HIV (stigma, depression, etc), lifestyle factors (travel history), and knowledge and perceptions of HIV and HTC (belief that HTC can lead to an early death or depression) serve as the primary barriers to uptake. Socio-demographic factors did not appear to influence uptake among males. A significantly ($p=0.016$) larger percentage of males than females (20.93% vs. 5.88% in females) also reported seeing no benefit in HTC. Though the relationship was not significant, 35.5% of men said they did not feel at risk for contracting HIV while just 25% of females held this belief. These specific differences are not observed in the literature, however, it is consistent with the findings of Wringe et al. (2008) to see a difference in factors influencing uptake between sexes.

From these results it can be seen that men have a lesser concern for contracting HIV and see less value in knowing their HIV sero-status. Women, on the other hand, see the value in being tested but are deterred from testing for other reasons. This further enforces the viewpoints of Vermund & Wilson (2002) that barriers to uptake are complex and implies that campaigns intended to improve testing uptake must be designed differently for both males and females.

It is interesting to note that while testing was overall higher among women, uptake of testing did not differ significantly between sexes in the chi-squared analysis of the entire study population. These results are contrary to most literature sources (Hendriksen et al., 2009; Nwachukwu & Odimegwu, 2011; Wringe et al., 2008), however are consistent

with those of Sekandi et al., (2011) and could be attributable to the relatively small sample of men participating in this study.

5.4 The Role of Stigma in Testing Uptake

Fear of stigma remains one of the most significant barriers to the uptake of HTC services in the Cape Coast Metropolitan Area. This was expected based on the findings of Iliyasu et al. (2006), Baiden et al. (2007), Irungu et al. (2008), and Ulasi et al. (2008). In this study, 77 of 113 participants that had never been tested for HIV (68.1%) listed fear of stigmatization as a contributing factor to why they had not been tested. In addition to this, 95 of 216 individuals who had heard of HIV (44.0%) reported that they would not buy fresh vegetables from someone who was HIV positive.

These results make it clear that stigmatization of PLWHA is in fact an issue that needs to be addressed in the area. While past and present HIV campaigns in Ghana such as the "**A**bstain **B**e faithful **C**ondom Campaign" and the "Know Your Status Campaign" have focused on the importance of HIV prevention and testing and counseling uptake, it is possible that stigma has not been adequately addressed large-scale, or that these de-stigmatization campaigns have not been effective. As is encouraged by Ulasi et al. (2009), stigma must be combated on multiple levels of society (in the healthcare sector, legal system, religious sects, local communities, within the family, etc) and through various tactics (educational workshops or meetings, training sessions, etc). The public health sector cannot combat this issue alone and it cannot be done solely through the use of billboard campaigns or radio advertisements. To eliminate stigmatization, all

community members must be reached and the sphere of fear surrounding the infection must be penetrated.

5.5 Misconceptions About HIV and HTC

The idea that HTC uptake could lead to an early death also served as a significant deterrent to HTC uptake among both male and female respondents in this study. Male individuals that believed HTC could lead to more severe sickness were also less likely to test that those not holding this belief. While some study respondents may have misinterpreted this portion of the survey questionnaire to ask if *HIV* could lead to early death or more severe sickness (as opposed to *HIV testing*) it is unlikely that all survey respondents made this mistake. In addition to this, a large percentage of both males and females reported that they had not been tested for HIV because they feared the results of the test and feared that the results could lead to depression.

It becomes clear from these findings that despite positive increases in knowledge of HTC service locations and the percentage of individuals being tested, outreach regarding the usefulness of HIV testing and counseling is necessary before the uptake of services can improve. Campaigns covering the pros of knowing your HIV sero-status, the benefit of accessing treatment early, and the number of HIV-positive individuals who have been successfully living healthy lives because they gained early access to treatment are necessary. A similar situation was reported by Larsson et al. (2010) in which men could recite HIV testing advertisements yet still did not know why they should be tested. In

this context it is essential that individuals not only know that they should be tested, but also know why they should be tested.

A small percentage of respondents reported cost of testing (8.9%) and cost of drugs (15.2%) as deterrents to HTC uptake. In Ghana, HTC is a service provided at no cost to the patient in all public healthcare facilities. Similarly, anti-retroviral drugs are provided at highly subsidized rates, with those living in severe poverty maintaining an ability to access the drugs absolutely free of cost. Though the percentage of individuals reporting these factors as barriers to uptake is relatively small, it remains a significant issue that individuals are not aware these healthcare services are provided free of charge. Through increasing awareness about the availability of testing and treatment for HIV at no cost to the individual, it is likely uptake of HTC services would increase.

5.5 Study Limitations

The limitations in this study are similar to those of other small-scale community based cross-sectional surveys on controversial or taboo subjects (Agha, 2012; Baiden et al., 2007). Due to time and monetary constraints 12 EAs were sampled in the Cape Coast Metropolitan Area, just two of which were considered rural locations. Ideally, 30 EAs would have been sampled and the rural communities would have been better represented. Because of this, generalization of study results is limited to the Metropolitan Area.

It was also seen that an unusually large number of highly educated (SHS and above) individuals participated in the study. This could be due in part to the nature of the study,

as only educated individuals may feel comfortable discussing their sexual health and a subject such as HIV/AIDS, or the fact that a large proportion of the study population was from an urban area. From the literature, individuals living in urban areas (Ghana Statistical Service, 2009; Nwachukwu & Odimegwu, 2011), of higher education (Agha, 2012; Ghana Statistical Service, 2009; Nwachukwu & Odimegwu, 2011; Wringe et al., 2008), and higher income brackets (Ghana Statistical Service, 2009) are often more likely to test for HIV. An over-sampling of these individuals could thus inflate the percentage of testing within the past year in the study population, yielding results that are not representative of the general Cape Coast population.

Because of the sensitive nature of the study subject, social acceptability bias may also alter the validity of results obtained in this study (Agha, 2012; Baiden et al., 2007). If individuals are educated about the dangers of risky sexual behavior or the importance of testing for HIV they may be more inclined to respond dishonestly if they believe their survey responses will not be confidential or the interviewer will discriminate against them for giving honest, but socially undesirable responses. It should be noted that in at least 19 of the 220 interviews conducted for this study, individual study participants were not alone with the interviewer but instead were accompanied by other individuals as well. Again, this could easily lead to individuals providing dishonest responses.

Other difficulties faced throughout the course of the data collection period were largely related to cultural differences or language barriers between the research assistants hired to conduct survey interviews and myself. Despite the fact that the survey was piloted twice

in the Madina community to check for adequate comprehension of study questions, it was clear when data analysis began that various interpretations of question meanings remained. Lack of understanding of question meaning led to an increase in question non-response as interviewers were more likely to skip questions they did not feel they understood well. A high level of non-response in turn led to research assistants returning to the field to re-interview participants with a large number of incomplete questions and the room for error increased. One question was dropped entirely from the data analysis process because it was clear the meaning of the question was not well understood by questionnaire administers.

To ensure the validity of study results, measures were taken to control these biases and limitations. As mentioned, one question was dropped from the survey, research assistants were asked to reenter the field to verify participants' responses, and I abstained from entering the field to collect data with the research assistants in an effort to minimize the effect of social desirability biases.

5.6 2012 Sentinel Survey Results

A portion of the data used in the initial justification of this study has recently been deemed largely irrelevant. From the 2012 HIV sentinel survey results released in mid-June of 2013, the dramatic increase in HIV prevalence experienced in the Central Region and Cape Coast Metropolitan Area between 2010 and 2011 has been reversed (National AIDS/STI Control Program, 2013). Though it has not been explicitly stated, it is possible

this sharp departure and return from and to the norm over the past two years was due in part to somewhat limited nature of the sentinel survey study design.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

In conclusion, it is clear that despite recent increases in HTC service availability and accessibility, increases in the percentage of individuals that know where to access HTC services, and increases in actual HTC uptake, old barriers to testing remain. Stigma continues to serve as the most prominent issue hindering testing uptake in the Cape Coast Metropolitan Area. Misconceptions regarding HIV and the risks and benefits of testing also remain and serve as other significant barriers.

A continuous, committed effort to reduce these challenges must be present if HTC is to see further improvements in the future. This effort must not be generalized, but instead, focused on sub-groups within the Metropolitan Area and tailored to a specific sex. HTC plays a pivotal role in further reducing the HIV burden within Cape Coast, Ghana, and throughout the world. Continuous monitoring of factors associated with HTC will allow us to bridge the gap between a desire to test and actual testing uptake, thus paving the way to treatment uptake and an end in transmission of the infection.

6.2 Recommendations

To all persons and organizations involved in the mitigation of HIV and AIDS within Ghana it is recommended that:

1. Future studies conducted on HTC uptake within Ghana should be scaled-up to include a qualitative portion of data and administered in each region within the country. Through a mixed methods approach to this type of study it is possible to capture more specific solutions to increasing HTC uptake.
2. Gender specific HTC campaigns must be established to address the various barriers to uptake observed in each sex.
3. In all HTC promotional material it is essential to stress not only the importance of being tested and knowing your sero-status, but the reasons for testing and the benefits of testing as well.
4. Stigma can only be eliminated through a multi-faceted, continual approach. The fight against stigma must be scaled up immediately and campaigns to eliminate this issue must reach every community within the country.
5. A continuous, committed effort to monitoring HTC uptake is necessary if newly emerging barriers are to be identified early and eliminated efficiently.

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APPENDIX A

INTRODUCTION AND CONSENT
Good (Morning/Afternoon/Evening). My name is _____ and I am working with the University of Ghana, School of Public Health. We are conducting a survey about health in the Cape Coast Municipality of Ghana. The information we collect will help the metropolis to plan health services. Your household was selected for the survey which usually takes less than 30 minutes to complete. All of the answers you give will be confidential and will not be shared with anyone other than members of our survey team. There are no risks or benefits from your participation in the survey. You don't have to agree to answer the questions, but we hope you will since your views are important. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time. In case you need more information about the survey, you may contact Miss Nana Abena Kwaa Addai-Donkor of Ghana Health Service Ethical Review Committee at 0244712919 or the Principle Investigator, Lindsey Filiatreau at 0545382029. Do you have any questions? Would you like to participate?
SIGNATURE OF INTERVIWER: _____ DATE: _____ I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any question I have asked have been answered to my satisfaction. I consent voluntarily to participate as a subject in this study and understand that I have the right to withdraw from the study at any time without in any way it affecting me. SIGNATURE OF INTERVIEWEE: _____ DATE: _____

APPENDIX B

IDENTIFICATION (1)	
PLACE NAME _____	
NAME OF HOUSEHOLD HEAD _____	
CLUSTER NUMBER……	
HOUSEHOLD NUMBER ……	
SEX OF RESPONDENT (FEMALE=1 MALE=2)	
INTERVIEWER VISITS	
DATE	
INTERVIEWER'S NAME	
RESULTS*	
*RESULT CODES 1 COMPLETED 2 PARTLY COMPLETED	
LANGUAGE OF INTERVIEW FANTI TWI ENGLISH	

APPENDIX C

#	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1	How old were you at your last birthday?	AGE IN COMPLETED YEARS ☐☐☐	
2	What is the highest level of school you attended: None, Primary, JHS, SHS, Tertiary?	NONE .....1 PRIMARY.....2 JHS.....3 SHS.....4 TERTIARY.....5	
3	What is your current marital status?	NEVER MARRIED.....1 MARRIED.....2 LIVING TOGETHER .....3 DIVORCED/SEPARATED .....4 WIDOWED 5	
4	What is your ethnicity? IF OTHER, PLEASE SPECIFY.	FANTE.....1 TWI.....2 GA.....3 EWE .....4 AKYEN.....5 AKWAPIM.....6 ASHANTI.....7 OTHER _____.....8	
5	What is your religion? IF OTHER, PLEASE SPECIFY	CHRISTIAN.....1 MUSLIM .....2 TRADITIONAL/ SPIRITUALIST.....3 NO RELIGION .....4 OTHER_____.....5	
6	What is your occupation, that is, what kind of work do you mainly do? INTERVIEWER: PROBE TO OBTAIN DETAILED INFORMATION ON THE KIND OF WORK RESPONDENT DOES. IF OTHER, PLEASE SPECIFY.	FISHERMAN .....1 FARMER .....2 HOUSEWIFE .....3 TRADER.....4 STUDENT .....5 CIVIL SERVANT.....6 UNEMPLOYED .....7 OTHER _____ 8	
7	How much money have you earned from work activities in the past week?	NONE .....1 GHC 1-50.....2 GHC 50-99.....3 ≥GHC100 4	
8	In the last 12 months, how many times have you been away from home for one or more nights for work or travel?	NUMBER OF TIMES ☐☐	
9	How often do you listen to the radio?	EVERY DAY.....1 AT LEAST ONCE A WEEK .....2 LESS THAN ONCE A WEEK.....3 NOT AT ALL.....4	
10	How often do you watch TV?	EVERY DAY.....1 AT LEAST ONCE A WEEK .....2 LESS THAN ONCE A WEEK.....3 NOT AT ALL.....4	
11	Does your spouse have other partners?	YES.....1 NO.....2 DON'T KNOW 3	 **Sec B** **Sec B**
12	Including yourself, in total, how many	NUMBER OF PARTNERS	

	partners does your spouse have?		
Section B: Now I would like to ask some questions about your sexual activity. Let me assure you again that your answers are completely confidential. If we should come to any questions that you don't want to answer, just let me know and we will go to the next question.			
13	How old were you when you had sexual intercourse for the very first time? IF NON-NUMERIC ANSWER, GET AN ESTIMATE.	NEVER HAD SEXUAL INTERCOURSE.....1 AGE IN YEARS..... ...	**Sec C**
14	In total, how many different people have you had sexual intercourse with in your lifetime? IF NON-NUMERIC ANSWER, GET AN ESTIMATE.	NUMBER OF PARTNERS IN LIFETIME DON'T KNOW.....8	
15	When was the last time you had sexual intercourse? IF LESS THAN 12 MONTHS, ANSWER MUST BE RECORDED IN DAYS, WEEKS OR MONTHS.	DAYS AGO WEEKS AGO MONTHS AGO YEARS AGO	
16	What was your relationship to this person with whom you had sexual intercourse?	WIFE/ HUSBAND.....1 GIRLFRIEND/ BOYFRIEND.....2 ACQUAINTANCE.....3 PROSTITUTE/ CLIENT.....4 OTHER _____ (SPECIFY) 5	
17	In total, how many different people have you had sexual intercourse with in the last 12 months?	NUMBER OF PARTNERS DON'T KNOW.....8	
18	Did you use a condom every time you had sexual intercourse in the last 12 months?	YES.....1 NO.....2	
19	Have you ever paid anyone or gotten paid in exchange for having sexual intercourse?	YES.....1 NO.....2	**CK**
20	Did you use a condom during sexual intercourse every time you paid someone in exchange for having sexual intercourse?	YES.....1 NO.....2 DON'T KNOW.....3	
CHECK 3:	**MARRIED OR LIVING TOGETHER----------→** **NEVER MARRIED, DIVORCED, WIDOWED ----------→**		**21** **Sec C**
21	Can you say no to your partner if you do not want to have sexual intercourse?	YES.....1 NO.....2	
22	Could you ask your partner to use a condom if you wanted him/ her to?	YES.....1 NO.....2	
PRESENCE OF OTHERS DURING THIS SECTION		NONE CHILDREN <10 MALE ADULTS FEMALE ADULTS	
Section C: Now I would like to talk about something else.			
23	Have you ever heard of an illness called HIV/AIDS?	YES.....1 NO.....2	**Sec D**
24	Can people reduce their chance of getting HIV/AIDS by having just one uninfected sex partner who has no other sex partners?	YES.....1 NO.....2	
25	Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had the AIDS virus?	YES.....1 NO.....2	

26	If a member of your family had HIV/AIDS would you want them to tell other people or keep it a secret?	YES.....1 NO.....2	
27	Do you know anyone that has suffered from HIV/AIDS?	YES.....1 NO.....2	**29**
28	Do you know anyone that is currently on treatment for HIV/AIDS?	YES.....1 NO.....2	
29	Do you know of a place where people can go to get tested for HIV?	YES.....1 NO.....2	**33**
30	Where is that? Any other place? PROBE TO IDENTIFY EACH TYPE OF COURSE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	PUBLIC SECTOR GOVERNMENT HOSPITAL .....1 GOVT. HEALTH CENTER .....2 STAND-ALONE VCT CENTER .....3 FAMILY PLANNING CLINIC .....4 MOBILE CLINIC .....5 FIELDWORKER .....6 SCHOOL BASED CLINIC .....7 OTHER PUBLIC SECTOR .....8 _____. (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC/PRIVATE DOCTOR ..... 9 STAND ALONE VCT CENTER .....10 PHARMACY .....11 MOBILE CLINIC .....12 FIELDWORKER.....13 SCHOOL BASED CLINIC .....14 OTHER PRIVATE MEDICAL.....15 _____ (SPECIFY) OTHER _____ .....16 (SPECIFY)	
31	How long does it take you to travel from your home to the closest location mentioned above?	DAYS HOURS MINUTES	
32	How much would it cost to travel from your home to the closest location listed above?	PESAWAS CEDIS	
33	Can getting tested for HIV cause any of the following?	MORE SEVERE SICKNESS DEPRESSION EARLY DEATH	YES .....1 NO.....2 YES .....1 NO.....2 YES .....1 NO.....2
34	Can getting tested for HIV lead to any of the following?	TREATMENT PROLONGED LIFE IMPROVED QUALITY OF LIFE	YES .....1 NO.....2 YES .....1 NO.....2 YES .....1 NO.....2
35	If you were tested for HIV would your friends and family still accept you?		YES .....1 NO.....2
36	I don't want to know the results but have you ever been tested to see if you have the AIDS virus?		YES .....1 NO.....2 **49**

37	When was your most recent HIV test?	DAYS AGO ☐☐ WEEKS AGO ☐☐ MONTHS AGO ☐☐ YEARS AGO ☐☐	
38	I don't want to know the results but did you get the results of the test?	YES .....1 NO.....2	
39	Why did you decide to get tested? IF OTHER, PLEASE SPECIFY.	ANTENATAL CARE .....1 PERSONAL DESIRE TO KNOW STATUS .....2 JOB REQUIREMENT .....3 DOCTOR'S RECOMMENDATION .....4 OTHER _____ 5	
40	Where was the test done? PROBE TO IDENTIFY THE TYPE OF SOURCE IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECOTR, WRITE THE NAME OF THE PLACE _____ (NAME OF PLACE)	PUBLIC SECTOR GOVERNMENT HOSPITAL .....1 GOVT. HEALTH CENTER .....2 STAND-ALONE VCT CENTER .....3 FAMILY PLANNING CLINIC .....4 MOBILE CLINIC .....5 FIELDWORKER .....6 SCHOOL BASED CLINIC .....7 OTHER PUBLIC SECTOR .....8 _____. (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC/PRIVATE DOCTOR ..... 9 STAND ALONE VCT CENTER .....10 PHARMACY .....11 MOBILE CLINIC .....12 FIELDWORKER.....13 SCHOOL BASED CLINIC .....14 OTHER PRIVATE MEDICAL.....15 _____ (SPECIFY) OTHER _____ .....18 (SPECIFY)	
41	How long did you wait to have the HIV test administered?	MINUTES ☐☐ HOURS ☐☐	
42	How long did you wait to receive the results?	MINUTES ☐☐ HOURS ☐☐ DAYS ☐☐ WEEKS ☐☐	
43	How much did it cost to get tested?	PESAWAS ☐☐ CEDIS ☐☐	
44	Were those involved in the administration of the HIV test (nurse, facility employee, etc.) helpful and friendly during your visit?	YES .....1 NO.....2	
45	From your knowledge, were your results kept confidential?	YES .....1 NO.....2	
47	Was anyone else present when you were administered the HIV test? If yes, who was present?	YES _____.....1 (SPECIFY) NO.....2	
48	Have you experienced any form of discrimination because you were tested for HIV/AIDS?	YES .....1 NO.....2	**Sec D** **Sec D**

49	Do any of the following contribute to the reason you have not been tested for HIV?	FEAR OF STIGMATIZATION FEAR OF BREACH OF CONFIDENTIALITY FEAR OF LOSING YOUR JOB FEAR OF THE RESULTS FEAR OF DEPRESSION FEAR OF YOUR SPOUSE'S RESPONSE ATTITUDE OF HEALTH FACILITY STAFF HOURS OF OPERATION OF TESTING CENTER WAIT TIME OF BEING TESTED WAIT TIME OF RECEIVING RESULTS COST OF TRAVEL TO CLINIC COST OF BEING TESTED COST OF DRUGS FOR TREATMENT LACK OF PRIVACY AT CLINIC OTHER _____ (SPECIFY)	YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2 YES.....1 NO.....2	
50	Please respond to the following statements with True or False:	YOU SEE NO BENEFIT OF BEING TESTED FOR HIV YOU DO NOT THINK YOU CAN BE AFFECTED BY HIV/AIDS	TRUE.....1 FALSE.....2 TRUE.....1 FALSE.....2	

Section D: Now I would like to ask you some questions about your experience.

51	**HEARD ABOUT AIDS:** Apart from AIDS, have you heard about infections that can be transmitted through sexual contact? **NOT HEARD ABOUT AIDS:** Have you heard about infections that can be transmitted through sexual contact?	YES .....1 NO.....2	**54**
Check 13:	**HAS HAD SEXUAL INTERCOURSE ----------→** **HAS NOT HAD SEXUAL INTERCOURSE ----------→**		**52** **54**
52	During the last 12 months, have you had a disease which you got through sexual contact? If yes, specify.	YES _____.....1 NO 2	**53** **54**
53	The last time you had (PROBLEM FROM 52), did you seek any kind of advice or treatment?	YES .....1 NO 2	
54	If a wife knows her husband has a disease that she can get during sexual intercourse, is she justified in asking that they use a condom when they have sex?	YES .....1 NO.....2	

The survey is now complete. Thank you for your time and participation