THE ROLE OF SOCIAL NETWORKS IN
THE DECISION TO TEST FOR HIV

by

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Abstract

The major global concern of preventing the spread of Human Immunodeficiency Virus (HIV) requires that millions of people be tested in order to identify those individuals who need treatment and care. This study’s purpose was to examine the role of social networks in an individual’s decision to test for HIV. The study sample included 62 participants of African and Caribbean origin in Toronto, Canada. Thirty-three females and 29 males, aged 16 to 49 years who had previously tested positive or negative for HIV, participated in interviews that lasted approximately 60 minutes.

Measurement instruments adapted from Silverman, Hecht, McMillin, and Chang (2008) were used to identify and delimit the social networks of the participants. The instrument identified four social network types: immediate family, extended family, friends, and acquaintances. The study examined the role of these network types on the individuals’ decisions to get HIV testing.

A mixed method approach (Creswell, 2008) was applied, and both qualitative and quantitative data were collected simultaneously. Participants listed their social networks and retrospectively described the role of their network members in influencing their decision to test for HIV. The participants’ narratives of the influence of social networks in HIV testing were coded. A thematic analysis of the qualitative descriptions of the network members’ influence was performed. The quantitative and the qualitative analysis results were then tallied.
The results of the study demonstrated that the influence of social networks was evident in the individuals’ decisions to test for HIV. The most influential group was friends, followed in descending order of influence by immediate family, acquaintances, and extended family. These social network ties provided informational, material, and emotional support to individuals deciding to seek HIV testing. For policy makers and health professionals, coming to a more complete understanding of these dynamics will enable them to make institutional decisions and allocate resources to improve and enhance the support available from within these social networks, thus encouraging, promoting, and leading to increased testing for HIV.
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Dedication

Dedicated with love to my family who understood that I could go my own way to study
And to all those organizations that are continuously fighting for an AIDS-free world.
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CHAPTER 1:
INTRODUCING THE PROBLEM

Outline of the Chapter

This chapter begins with a brief description of the importance of testing in HIV prevention and a statement of the problem. Next, the role of social network strategies in HIV testing are discussed, followed by a presentation of the research questions and significance of the study. Finally, I situate myself as the researcher of this study and conclude with the organization of the thesis.

HIV Testing and the Problem Statement

Recent studies show that HIV testing contributes to the prevention of HIV/AIDS and knowledge of HIV status leads to a reduction in risk behavior (Marks, Crepaz, & Janssen, 2006), and The Joint United Nations Program on HIV/AIDS (UNAIDS) and World Health Organization (UNAIDS/WHO, 2007a). However, new infections of HIV may still occur through individuals who are unaware that they carry the virus. When people are totally unaware that they have HIV, they continue to spread it to their sexual partners. This is why routine screening for HIV infection has been introduced by some countries.

Despite the progress made in the potential life saving treatment of HIV/AIDS, a majority of infected people still present themselves very late for testing with advanced HIV-related illnesses (UNAIDS/WHO, 2010). The British HIV Association (2006) reported 25% of diagnosis happened too late, and that late diagnosis accounted for 35% of HIV-related deaths in the United Kingdom. In 2009, the Joint United Nations Program on HIV/AIDS (UNAIDS) and World Health Organization (WHO) reported that about 33.4 million people around the world were
living with the AIDS virus and the number of newly infected people globally had remained at about 2.7 million annually (UNAIDS/WHO, 2009).

HIV testing helps to monitor the viral load and blood count that guides HIV treatment prevention and care. UNAIDS/WHO (2007b) recommended that HIV/AIDS treatment should begin before a patient’s CD4 blood count (a measure of the severity of infection in the blood cells) was below 350 cells per cubic millimeter. A healthy individual has a CD4 count of at least 500 cells or more per cubic millimeter. Late diagnosis, when the CD4 count is very low, complicates the treatment of the many infections like tuberculosis and malaria associated with HIV.

About one third of HIV-related deaths globally occurred in sub-Saharan Africa (Setswe, Wabiri, Seager, & Peltzer, 2009). In that region, the estimated proportion of HIV cases that remained undiagnosed was about 90%. Many babies die of HIV/AIDS related-illnesses because their HIV-positive parents are unaware that they have the infection.

Based on the Public Health Agency of Canada report (2008b), about 27% of the 58,000 Canadians living with HIV are unaware of their status and therefore unable to obtain treatment even when treatment is accessible. The Agency noted that HIV rates in Canada have increased over the past 5 years. Since many of the infected individuals are unaware of their condition, HIV/AIDS had remained a hidden epidemic in the country.

In the 2008 report, Public Health Agency of Canada found that, by 2007, over 20,000 cases of AIDS had, so far, been diagnosed in the country. The number of diagnosed new infections has been contained at about 300 per year due to the impact of antiretroviral therapy (Public Health Agency of Canada, 2008a). A significant difference between developed countries like Canada and developing countries is access to appropriate treatment for all HIV-positive
patients. Many HIV-positive patients in developing countries do not have access to retroviral treatment.

Unless more people with undiagnosed infection get prompt testing, the epidemic will continue to spread. Appropriate provision of antiretroviral drugs depends not only on the financial and human resources available but also on finding the people who need them, by encouraging them to seek HIV testing so that they become aware of their HIV status. The expansion of voluntary HIV testing could radically improve not only access to treatment but also a reduction in the further spreading of HIV/AIDS. Thus, in order to stop further spreading of the epidemic, it is essential to find ways to encourage more people with undiagnosed infection to get prompt HIV testing.

**Social Network Strategies in HIV Testing**

Klovdahls’ study (1985) of social networks and the spread of HIV/AIDS was one of the first in public health. Davies (2009) found that the first social network analysis in public health was used for epidemiological studies to understand the spread of HIV/AIDS. The second was to understand how information and ideas about disease spread within communities. The third use was on program planning and designed on the basis of knowledge about the structure of social networks.

In promoting HIV testing, McCree, Eke, and Williams (2007) suggested that social network strategies provide an opportunity to target entire networks rather than just individuals because social networks use naturally existing social relationships that have influence on the network members. From 2003-2005, Centers for Disease Control and Prevention (CDC) demonstrated the feasibility of using social network strategies to identify individuals with
undiagnosed HIV infection (CDC, 2006). The recruiters targeted men of color who have sex with men and men who have sex with men and are injection drug users in their social networks. However, the model could still be applied to the wider population without the need of enlisting recruiters.

HIV/AIDS is a stigmatized illness. Singling out particular population groups for testing can stigmatize patients with the disease, which then causes others to resist all attempts to test for HIV (Shrestha et al., 2010). HIV patients have a right to refuse testing for HIV, if they wish. Patients are protected by law not to be pressured or forced into testing for HIV against their will (Baggaley, 2008). Enlisting people to actually recruit others for HIV testing is a breach of the confidentiality that is normally a pre-requisite for HIV testing. The purposeful and planned use of social network strategies will more likely provide an effective approach in identifying persons with undiagnosed HIV infection for testing.

The Research Question and This Study’s Significance

This research undertaken represents an initial attempt to determine the influence of personal social networks in the decisions to test for HIV. The research question to be answered by this study is whether social networks have influence on an individual’s decision to test for HIV. Much remains to be understood about how social networks influence their members to maximize their efforts in fighting HIV/AIDS. Given the importance of early diagnosis to the effective treatment of HIV, and evidence to be discussed in chapters 2 and 3 about the importance of social networks’ responses to uncertain social conditions, this study seeks to address two main objectives:
1. To examine types of social network relationship ties that influence individuals’
decisions to test for HIV.

2. To explore why and how types of social network relationship ties influence
individuals’ decisions to test for HIV.

The study focuses on Canadians of African and Caribbean origin in Toronto. The Public
Health Agency of Canada (2007a) noted a sharp increase of AIDS cases among this group
between the 2001 census and that of 2006.

Situating Myself as a Researcher

My research interest in HIV prevention and social networks was influenced by my
professional background and work experience in education. Equipped with a B.A. Honors
degree, a Graduate Diploma in Education and later a Master of Education degree in Psychology,
I started my career in education as a High School principal in Zimbabwe. In a school of more
than 800 boarding students, social interactions and group structures became my focus of interest.
I wanted to understand friendship choices and interpersonal relationships among students and
staff. People’s relationship ties influenced behavior changes in a school environment.

Through the active involvement of certain groups of students in the school affairs, it was
possible to turn the school around from a hostile environment into one conducive to successful
academic work.

When I moved to my next appointment, I became responsible, as national coordinator, for
designing the implementation of the United Nations Children’s Fund (UNICEF) HIV/AIDS
education program in Zimbabwe. Building on my experience from the school system, I used
local leaders to introduce reproductive and sex education that had previously been resisted in
communities. I was involved in developing a training manual for HIV/AIDS educators (Ellison, Wiggins, Stewart, & Thomas, 2001). I noticed how local leaders of the same communities could shape and change attitudes and values to reduce the risk of HIV transmission.

After participating in a study on the effects of HIV/AIDS on the education sector in Zimbabwe, I gained more insight into how social influence in the transmission of HIV differed from one population setting to the other. Understanding the link between group relations and HIV transmission provided me with a sound foundation to undertake my thesis on the role of social networks on the decision to opt for HIV testing.

In designing curricula for HIV/AIDS and Life Skills Education in schools, I encouraged participants to focus on the importance of the peer-driven models for HIV prevention. These ideas dominated the approach to HIV/AIDS teaching in many schools. Peer education emphasized experiential interactions and knowledge exchange among friends. As in peer-driven interaction, social networks offer similar opportunities for individuals to exchange information and to evaluate ideas likely to be important when an individual is uncertain about the best response to an innovation, environmental change or to new social circumstances.

At the international level, I represented Zimbabwe on the committee of the Global Fund to Fight HIV, Malaria and Tuberculosis. After participating in the development of the regional strategic plan for HIV/AIDS prevention in the education sector in the Southern African Development Community (SADC) region, I became aware that HIV patients could live longer if they were tested early enough to start treatment before HIV infection had developed into AIDS.

In Southern Africa, I witnessed the suffering of close relatives, colleagues and friends, and the premature deaths caused by AIDS, which could have been avoided had the diagnosis of the virus been done earlier. The Commonwealth Education Fund believed that education and
health supported each other and needed to be addressed simultaneously if the Millennium Development Goals (MDGs) were to be achieved. Moving to join the Commonwealth Education Fund provided me with the opportunity to work with different civil society organizations that supported universal access to education and health services for all.

While with the Commonwealth Education Fund in Zimbabwe, I was able to initiate the establishment of a coalition of civil society organizations that included three leading British charities – Action AID, Oxfam and Save the Children (U.K.) – to support equal access to quality elementary education and health for all children in Zimbabwe. In addition to these efforts, I initiated the creation of a national trust fund for assisting orphans affected or infected by HIV/AIDS. I designed and implemented an in-service training program to train teachers for HIV/AIDS education that the Ministry of Education introduced in the school system.

I have always counted myself privileged to be able to have worked in preventing the spread of HIV. I also appreciate the fact that through my current study, I have had the special privilege to work with AIDS Service Organizations in the Greater Toronto Area to expand on my previous knowledge.

**Organization of the Thesis**

The thesis comprises seven chapters. In the introductory chapter, attention has been focused on contextualizing HIV as a global public health crisis, the importance of HIV testing in effective treatment, and the role of social networks in HIV testing. The chapter provides a rationale for the research question and study objectives.

Chapter 2 achieves two purposes: it gives an overview of the epidemic and transmission mechanisms of HIV and discusses strategies and factors affecting HIV testing.
Chapter 3 describes the theoretical perspective of social networks. The types of social network relationship ties of immediate family, extended family, friends and acquaintances are described in this chapter.

Chapter 4 describes the research design used in this study. A retrospective approach was used in the collection of the participants’ experiences in the decisions to test for HIV. It describes the collection of quantitative data: of the participants and their network members, and of qualitative data about how social network members influenced the decisions of the individual participants to test for HIV. A structured interview guide was used as an instrument for data collection for the study. The chapter describes the setting of the study, sampling, recruitment strategies, data collection procedures and analysis of results.

Chapter 5 analyzes the research findings of both quantitative and qualitative data. Chapter 6 presents the discussion of the results, policy implications of the study, limitations and recommendations for future research.
CHAPTER 2:
UNDERSTANDING HIV/AIDS

Outline of the Chapter

This chapter presents the historical and clinical aspects of the epidemic including HIV/AIDS risk perception. In the chapter, I also show the global response to the epidemic and factors that affect progress in the fight against the epidemic. The chapter concludes with a summary of views about social networks and the HIV epidemic.

The Global Epidemic: An Historical Overview

Acquired Immune Deficiency Syndrome, or AIDS, as it is most commonly referred to, is a condition which hampers the body’s ability to fight diseases. AIDS is caused by Human Immunodeficiency Virus, or HIV. The majority of HIV infections come from having unprotected sex with an infected person or sharing a contaminated needle with someone who is infected (Hethcote & Van Ark, 1992).

The first cases of AIDS were identified in the United States in 1981 from five homosexual men in Los Angeles and 26 others in New York and California (Uchino, 2004). AIDS was also found in heterosexual men and intravenous drug users (IVDUs) in the early 1980s (CDC, 2006; Moss et al., 1987). Since the discovery of the virus, studies have observed the rapid spread of HIV in Africa, Europe, Asia, North and South America and in many other parts of the globe.

In 1988, at the first World AIDS Conference, it was estimated that only 150,000 people worldwide were infected with HIV (J. M. Mann, 1989). Twelve years later, in 2000 the estimated number of people living with HIV had dramatically risen to 33 million people. About 2 million
had died from AIDS-related illnesses in 2007 (UNAIDS/WHO, 2008a). The worldwide rate of HIV infection was spreading at a varied rate from country to country and often among population groups within particular geographic regions. The mode of HIV transmission in North America, Western Europe, Australia and New Zealand is predominantly by homosexual contact. In Africa and other countries HIV transmission is through heterosexual contact (UNAIDS/WHO, 2010). There is no scientific evidence of spread from toilet seats, by insect bite, or by casual contact.

By tracing the transmission of HIV in Europe, Paraskevis et al. (2009) found that the United Kingdom, Israel, Norway, the Netherlands, Sweden and Switzerland were both exporters and importers of HIV. Austria, Belgium, Denmark, Germany and Luxembourg were largely receiving people with HIV from other countries.

In Eastern Europe, Central Asia and China, the epidemic was still in the expansion stage. An estimated 4.7 million people were HIV infected in Asia by 2008 (UNAIDS/WHO, 2008b). China’s prevalence rate was about 0.1% of the population, which is significant considering the sheer size of China.

Sub-Saharan Africa, the epicenter of the epidemic, has the highest levels of HIV infection globally, followed by the Caribbean countries and South America. Sub-Saharan Africa, where AIDS is the leading cause of death has 22.4 million people infected with HIV; about two thirds of all HIV-positive people worldwide live in that sub-Saharan region (Setswe et al., 2009). There is also enormous variation in the HIV infection rates within Africa. In Madagascar the prevalence rate of HIV is under 1%, but over 12% in eight countries: Botswana, Lesotho, Malawi, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, countries in the Southern African Development Community (SADC) region (UNAIDS/WHO, 2008b).
The reason for the enormous variation remains poorly understood. For example, South Africa with an estimated 5.7 million HIV-infected people, or about 18% of the adult population (UNAIDS/WHO, 2008b), is both the main exporter and importer of the virus in the region. Kalipeni, Craddock, Oppong, and Ghosh (2004) estimated that about half of the mine workers returning home to neighboring countries after a spell of working in South Africa were infected with HIV. Lurie (2004) ascribed the rapid diffusion of HIV in this region to the high level labor migration in the countries that are geographically connected to one another in the region. He believed that migration and informal cross-border trading activities contributed significantly to the spread of HIV in the SADC region.

The prevalence of HIV/AIDS in Canada was discussed briefly in chapter 1. Without repeating the same points, this thesis focuses upon first-generation Canadians of African and Caribbean origin because there is growing concern about increased HIV prevalence within that group (Public Health Agency of Canada, 2007b). As noted in the report, by 2007 nearly 60,000 cases of HIV and nearly 20,000 cases of AIDS had been recorded in Canada. While the spread of the disease appears to be under control, the report notes that the proportion of AIDS cases within the white people had declined from 91% in 1988 to 58% in 2007, whereas over the same period, there were steep increases in the proportions attributed to Aboriginal and Black people. These two groups are now highly overrepresented. The Public Health Agency of Canada also noted an increase of 11.2% in the prevalence of HIV among females in the age group 15 to 29 of all HIV positive tests in 2008 compared to the previous year.

Among Aboriginal peoples in Canada the disease has spread primarily through injecting drug users; among Canadians of African and Caribbean origin, HIV infection, it is believed, is spread primarily through heterosexual sex. As noted, among Canadians of African and Caribbean
origin, it is believed that HIV has been imported from their countries of origin: primarily Sub-Saharan Africa and some Caribbean islands. This study focuses upon first-generation Canadians of African and Caribbean origin because of their increased prevalence, and in Toronto, as a major centre for these communities.

Concern about immigrants coming to Canada with HIV was raised by the Public Health Agency of Canada (2005). An estimated 7,500 individuals with HIV residing in Canada were “heterosexual endemic”, that is, from a country in which HIV/AIDS was endemic, primarily Sub-Saharan Africa and the Caribbean. Persons from HIV-endemic countries continue to be over-represented in Canada's HIV epidemic. While they comprise only 1.5% of the Canadian population, their estimated infection rate is almost 13 times higher than among other Canadians. In those countries, the main source of HIV infection is heterosexual transmission.

“An estimated 60% of people living with HIV in the African and Caribbean communities in Canada do not know that they have the infection,” according to Read, Remis, and Stewart (2004, p. 3). The failure to access diagnostic and treatment services by people who have immigrated to Canada from countries with a generalized HIV epidemic is a significant challenge.

Organizations working in these communities note that the fear of racism and disgrace of HIV can make people reluctant to seek HIV testing (Lawson et al., 2006). Those who are non-status refugees and immigrants suffer the additional hardship of not being accorded access to full Canadian health coverage (Rousseau et al., 2008). Evidence links lack of health insurance with lower quality and quantity of medical care use and with greater morbidity for both adults and children (Rousseau et al., 2008). A growing number of health care professionals working with refugee populations are alarmed because access to health care is increasingly difficult for undocumented and uninsured families living in Canada.
HIV/AIDS Risk Perception

HIV illness occurs approximately 2 to 4 weeks after infection (Baggaley, 2008). This may be the opportune time to test for HIV before the development of AIDS many years later. For many people infection with HIV is not suspected immediately following infection and therefore the opportunity to detect HIV early enough is usually missed.

As the disease progresses, infection can be suspected, when symptoms including fevers, rash, night sweats, diarrhea or swollen lymph nodes, headache, aseptic meningitis and many others begin to show. Anyone showing these symptoms may be perceived to be at risk of infection with HIV and a test for HIV is recommended. An individual’s sexual risk may be difficult to establish, but it is usually advisable to get routine testing to ascertain one’s HIV status. Blood donors, dialysis patients, organ donors and recipients need to be routinely tested for HIV to prevent transmission of HIV.

The Global Response to the HIV/AIDS Epidemic

Although no cure is presently available, recent biomedical research has been extremely successful in extending the lives of individuals infected with HIV (UN General Assembly, 2008). Medical interventions now view HIV infection as more of a chronic condition to be managed (like diabetes). Antiretroviral therapy is significantly extending the lives of patients living with HIV. However, the monetary costs associated with the strict regimen of HIV treatment can be substantial. This problem is greater in less economically developed countries where HIV infection has become one of the most serious health threats in recent history. This is why HIV testing is encouraged in order to bring the epidemic under control.
Substantial progress has been achieved in bringing essential HIV services to those in need. The number of people receiving antiretroviral drugs increased five-fold between 2003 and 2006. A decline in HIV prevalence has been reported in several countries following the implementation of strong HIV prevention measures (UNAIDS/WHO, 2008b).

As global economies fall, many donor nations are reducing the size of their AIDS spending. These tough economic times mean that more efficiency is needed in HIV/AIDS treatment and prevention programs. Putting more people on anti-retroviral drugs to save lives and prevent new infections is a difficult challenge especially for developing countries and remains a top priority.

**Factors Affecting HIV Testing and Early Diagnosis**

Foster (2007) found that stigma, fear, denial and discrimination were major barriers in delivering HIV/AIDS prevention programs in many communities. Foster noted that stigma encouraged people to keep their HIV status a secret. Until the barrier of stigma is breached, it is unlikely that attempts to motivate at-risk individuals to engage in voluntary testing will be successful (Smith & Morrison, 2006).

Denial also is a strong barrier in HIV testing and prevention. Denial has been used to describe the attitude of people or governments that refused to acknowledge that HIV exists and that it is a social problem not a crime. The tendency to deny the risk of HIV/AIDS relates to less information and negative attitudes towards the disease and preventive behaviors (Ben-Zur, Berzo, Breznitz, & Wardi, 2000). Denial has influenced decisions in HIV testing and government policies on HIV/AIDS.
In recent years, the debate is about criminal convictions of persons who knowingly infect their sexual partners with HIV. In 2008, Johnson Aziga was found guilty by a Canadian court of murder for knowingly infecting a sexual partner with HIV (The Canadian Press, 2008). His lawyers argued that the verdict sets a bad precedent that would deter people from deciding to seek HIV testing and disclosing their HIV status to sexual partners.

Public policy with respect to HIV/AIDS testing has been raised in the context of immigrants to Canada because, as noted, immigrants from Sub-Saharan Africa and the Caribbean are over-represented among HIV cases in Canada. Remis, Swantee, Schiedel, and Liu (2005) found that there were 26,355 people in Ontario living with HIV. There was a 72% increase in HIV prevalence since 2001 among persons from HIV-endemic regions, which included the Caribbean and sub-Saharan African countries. In 2006, an estimated 1,800 persons were newly infected with HIV in Ontario. This showed that further prevention research was needed to develop effective programs for HIV prevention.

**Conclusion**

This chapter gives an overview of the HIV/AIDS epidemic, both internationally and in Canada, discusses perceptions of HIV risk and considers some factors affecting HIV testing. The chapter provides a rationale for focusing the study on HIV testing within first-generation immigrants to the Greater Toronto Region of African and Caribbean origin. The chapter looks at some of the mechanisms that affect HIV testing and provides an entrée to the thesis’s focus upon social networks and explores their influence on the decisions to seek HIV testing.

The rationale for focusing this study on social networks was discussed briefly in chapter 1. Chapters 3 develops the rationale further, and chapter 4 in particular, reviews the growing
body of evidence on the potential importance of social networks in HIV’s spread and containment. The focus upon social networks could be viewed as a community-based approach to HIV that has been spurred in part by new testing technologies that make expanded testing easier. Clinics for rapid HIV tests, encouraged by the British HIV Association, can provide preliminary results during a single visit by a patient (Branson, Burstein, Greenwald, & Pincus, 2006). The development of such services may encourage potentially high-risk individuals who would not otherwise have access to HIV testing through conventional services. However, understanding the social mechanisms that increase the probability of people opting for testing is of essence, and as such is the focus on this thesis.
CHAPTER 3:
SOCIAL NETWORK THEORY

Overview

The purpose of this chapter is to explain the concepts in social network theory and its application to HIV/AIDS studies. I will begin by giving a brief overview of social network theory, and then go on to describe the difference between egocentric and whole networks. After this I will explain social network concepts within the analysis of egocentric networks on which this thesis is based. I will then examine the application of social networks as methods and tools in the area of HIV/AIDS. In conclusion, I will summarize the chapter by discussing how social networks are used as a tool to guide social science research that offers a more complete perspective in understanding the way people are connected and evolve (Valente, 2010).

What Is a Social Network Theory?

Social network theory is an approach for explaining social relationships in terms of structure and ties (Valente, 2010). These relationships can be illustrated in a simple social network diagram where nodes are the points and ties are the lines. Nodes are the individual actors and ties are relationships between the actors in a network. Social network theory (SNT) is also known as network theory or social network analysis (SNA) (Borgatti, Mehra, Brass, & Labianca, 2009).

A key development of social network analysis began with the development of sociometric measurements in 1932. Sociometry is a method for representing interpersonal relationships in a group. Jacob Levy Moreno and his colleagues conducted the first sociometric longitudinal study from 1932 to 1938 at the New York State Training School for Girls in
Hudson, New York to investigate the reasons why the girls were running away from school. They mapped the social network at Hudson using sociometry, a technique for representing individuals’ subjective feelings toward one another (Moreno, 1934, as discussed in Borgatti et al., 2009).

On the basis of the links in this social network, Moreno discovered that the social network of Hudson provided the channels for the flow of social influence and ideas among the girls in ways that even they themselves were not aware of. From the evidence, Moreno (1934) found that it was the girls’ location in the social network that helped to identify which girls would run away and when they would run away from school (as discussed in Borgatti et al., 2009). Sociometry showed the patterns of how the girls associated with each other when acting as a group toward a specified end or goal (Valente, 2010).

Moreno (1934) argued that the individual girls had not intended to run away, but had been influenced to do so as a result of the position they occupied in the social network (as discussed in Borgatti et al., 2009). Sociometry provided a way of turning social structure from abstract concept to concrete form (Moreno, as discussed in Borgatti et al., 2009). Moreno and many researchers in settings including other schools, the military, therapy groups, health, and business corporations have used sociometrics in their studies.

In the 1940s and 1950s, the most important discovery in social network analysis was from a laboratory experiment at the Massachusetts Institute of Technology (MIT). Results from this experiment showed that information transmitted from more centralized structures within a network was more accurate and travelled faster than information from nodes in decentralized structures. The discovery by Bavelas and Barrett (as discussed in Borgatti et al., 2009) influenced researchers from fields as widespread as psychology, political science and economics.
Stanley Milgram (1967) circulated the popular “six degrees of separation” which state that any two people in the world can get to know each other by no more than six steps of intermediate friend chains (as discussed in Borgatti et al., 2009). Pool and Kochen (1978) speculated, on the basis of mathematical models that in a population like the United States at least 50% of pairs could be linked by chains with no more than two people (as discussed in Borgatti et al., 2009). Watts (1999) coined this as the “small world” problem. During this period, network analysis was also used in examining whether urbanization and cities destroyed community. Social network analysis was able to demonstrate that relations between people were basic to community life in cities (Borgatti et al., 2009). Social network forms of representation of communities have become one of the main focuses for public policy research today (Grannerman, 2006).

In the 1970s, Mark Granovetter developed the influential strength of weak ties theory (SWT) which asserts that our acquaintances (weak ties) are less likely to be socially bound to one another than our close relationships (strong ties). Granovetter (1973) asserted that there is a tendency for those to whom we are only weakly tied to have better access to job information than those with whom we have strong ties. On the other hand, Weimann (1983) showed that the diffusion of information was faster through strong ties and that most influence is carried through strong ties.

From these varied research initiatives, social network analysis emerged as an established scientific field with a professional organization of its own, an annual conference, specialized software (e.g., UCINET and Pajek) and its own journal (Marin & Wellman, 2009). Since the 1990s, application of network analysis has spread into mathematical, physics, biological, behavioral and organizational studies (Krause, Croft, & James, 2007).
Social network analysis is a technique for the study of relationships and how they affect behavior (Valente, 2010). It focuses on patterns of relationships between actors and examines the exchange of resources between them (Scott, 1991; Wasserman & Faust, 1994; Wellman & Berkowitz, 1988). Network analysis views interactions between individuals structurally. Nodes are the individual actors within the networks, and ties are the relationships between the actors (Wasserman & Faust, 1994). Social network approaches analyze behavior from the perspective of social structure and relational data to explain how individuals connect to each other. Network analysis is not based on attribute data of individuals such as body size, sex or color (Marin & Wellman, 2009). Network theory asserts that social networks control individual actions and behavior (Ethier, 2006). Of particular importance to the current study is the argument that social network theory helps us understand that information for disease prevention and other health interventions can be particularly effectively disseminated across populations through social network channels (Valente, 2010).

**Studying Egocentric Networks versus Whole Networks**

Egocentric networks focus on specific egos or actors and those who have relations with them (Carrasco, Hogan, Wellman, & Miller, 2006). The ego is the person whose behavior is being analyzed (Valente, 2010). Collection of egocentric data in social network studies is done through a name generator by asking the egos (participants) to identify people (alters) with whom they talk about important matters in their lives or with whom they talk frequently. The name generator is the technique for collecting names in the individual’s network through a set of questions.
Egocentric data are used for measuring network patterns such as the strength of relationships, frequency of interaction, type of relations (e.g., family, friend, acquaintance), demographic characteristics and content of communication (Valente, 2010). Egocentric networks consist of two levels, namely the ego level of specific actors and the alter level consisting of those who have relations with the egos. At ego-network level, overall network features and the ego’s characteristics are presented. At the ego-alter level, characteristics of each alter and alter-ego ties are shown (Carrasco et al., 2006) together with the kind of resources that flow to and from each network member.

Whole (sociocentric/sociometric) networks refer to complete networks in the environment (Valente, 2010). They focus on all nodes in the environment being studied and they capture the presence or absence of relations between every pair of nodes in a population such as a school, community, organization or nation (Marin & Wellman, 2009). The main challenge of the whole network approach is in obtaining responses from all members of the population that is being surveyed. Whole network studies examine structures that are regarded as bounded social collectives. In settings with large populations, boundaries are difficult to define (Carrasco et al., 2006). Today, however researchers are able to analyze networks of thousands of nodes with tens of thousands of links by using computers (Valente, 2010).

The use of the ego network approach was found to be appropriate for this study because I am studying how ego-alter ties influence specific individual’s decisions to seek HIV testing. I did not have any access to alter level data since many of the alters lived in different parts of the world.
Concepts in Egocentric Networks

Some key concepts in egocentric networks to be described in this section are nodes, ties, strength of ties, frequency of contact (interaction), resource exchange, network density, closeness of ties and centrality. The explanation of concepts in egocentric networks will set the stage for the methods section of this thesis.

Node.

In the social network structure, a node or network member is the basic unit for analysis (Borgatti et al., 2009). The patterns of relationships in a network rely on interpersonal relationships between nodes. Social network theory asserts that it is these patterns that influence behavior. This perspective differs from the perspective of traditional social science researchers who looked at behavior as a function of the individual’s attributes such as education, color or gender. To show a network structure in graphical or matrix form, nodes are taken as the physical actors in the network. This allows us to put interactions between nodes into the wider context of the network.

Nodes can bind together to form new entities with similar roles. The construction of new entities creates structural holes in the network structure. A structural hole is the absence of a tie among a pair of nodes in the ego network. Borgatti et al. (2009) also noted that nodes become similar when they have ties to the same alters or are experiencing the same social environment. The network structure helps to identify structural holes and the most central node in a network (Borgatti et al., 2009). Connections between the nodes show the overall structure of a network system permitting for the study of information transmission and disease prevention in a population setting.
Guimera, Mossa, Turtschi, and Amaral (2005) identified a number of categories of nodes to determine how connected they were in a single metric for the entire community. They observed that community leaders were those nodes (actors) who were well linked to other nodes when the community was viewed as a graph.

**A network tie.**

A tie describes the connection between pairs of actors (Haythornthwaite, 1996). Ties help to explain how information is exchanged between the actors and how the information that is shared affects the behavior of network members. The tie between a pair of actors may be based on one or more relationships. For example, pairs may be linked by attending the same class or maintain a multiplex of ties, based on many relations, such as sharing information and seeing the same family doctor.

Granovetter (1983) distinguished between weak and strong ties. Weak ties are generally infrequently maintained and non intimate while strong ties are connections of emotional closeness with frequency of contact, as between close friends or relatives (Marsden & Campbell, 1984).

**Strength of ties.**

Strength of ties refers to the intensity of a relationship (Haythornthwaite, 1996). The strength of a tie may be measured by the amount of time, the emotional intensity, the intimacy and reciprocal resources exchanged (Granovetter, 1973). People would exchange more material resources with family members than with acquaintances. Ties do not provide a sufficient link unless present in a certain quantity or frequency.
The strength of a tie may depend on the number and types of resources which a pair exchanges, or on the strength of the relationship that is maintained. Marsden and Campbell (1984) suggested that duration of the association, frequency of contact, closeness, intimacy of the tie (mutual confiding), and the provision of reciprocal services or resources measure tie strength. Closeness of a relationship has been considered as the main measure of tie strength. Thus, relationships of close friends have been said to be stronger ties, while acquaintances or friends of friends have been called weaker ties (Marsden & Campbell, 1984).

Strongly connected nodes are able to disseminate information more quickly to others than nodes with weaker ties. Granovetter (1973) argued that those to whom we are weakly tied are more likely to have novel information different from our own and thus may have access to information different from that which we receive from our stronger ties. His argument confirmed the importance of weak ties in the transmission of new, innovative information.

It is the nature of an individual’s ties that affects the kinds of information a person receives (Haythornthwaite, 1996). Weimann (1983) found that strong ties facilitate the speed of flow of the information and network influence, but weak ties may have access to more and different information due to their connections with networks different from our strong ties. Weak ties also provide the bridges across the boundaries of social groups (Granovetter, 1983).

**Type of ties.**

The role of ties is indicated by the types of ties such as immediate family members, extended family members, friends and acquaintances. Types of ties are the kinds of relations people have in their networks (Valente, 2010). Types of ties account for the kind of social network support that individuals receive.
Generally, individuals turn to different types of network ties for assistance with their everyday tasks. The extent of help seeking, in the social network, and the outcome of the help individuals receive depends on type of tie relied upon. Table 1 shows four different types of ties: immediate family members, extended family members, friends and acquaintances and their role in response to HIV.

Table 1

Typology of Social Networks

<table>
<thead>
<tr>
<th>Type of network tie</th>
<th>Network Composition</th>
<th>Strength of tie</th>
<th>Functional components of support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Immediate family</td>
<td>Family-focused: Restricted to nuclear and immediate family members, Small. Strong ties</td>
<td>Includes: Spouse, partner, son, daughter, father, mother, brother, sister and grandparents. Closely Connected</td>
<td>Strongly connected by birth. Greater face-to-face contact. The majority resided in the same household</td>
</tr>
<tr>
<td>2. Extended family</td>
<td>Family-focused: Extended to broader family and kin. Larger. Strong ties</td>
<td>Includes: Kin, all relatives not in nuclear family (e.g., in-laws)</td>
<td>Strongly connected and influenced by birth. Less face-to-face contact</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>*Fear of stigmatization to both self and family</td>
</tr>
</tbody>
</table>
### Types of network ties, characteristics and support functions

#### Functional components of support

<table>
<thead>
<tr>
<th>Type of network tie</th>
<th>Network Composition</th>
<th>Strength of tie</th>
<th>Type of social capital (emotional, informational and material support)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Friends</td>
<td>Peers/friends/Buddies</td>
<td>Emphasizes friend relationships. Free association and social interactions. “Family” of personal choice</td>
<td>Open to discuss with. Strong on informational support. <em>Discussion about HIV is informal and open.</em> Not judgmental</td>
</tr>
</tbody>
</table>

4. Acquaintances | Neighbors, colleagues, mates, professionals acquaintances | Widely open and not dominated by any one kind of relationship. Emphasizes informal relationships in state of flux | More open to discussion than with all family and friends. *Provides wide resources for communication and* *Larger size of network support.* |

*Note.* Types of ties with characteristics and social support adapted from Uchino, 2004. Network members who are friends are generally expected to provide specific types of support and to maintain closer ties to each other than with acquaintances.

The immediate family in this study consists of spouses or sexual partners, sons and daughters, siblings or any member of the nuclear family and parents. The extended family type of tie consists of all kin members including grandparents, uncles, aunts, cousins and nephews.
The non-kin type of ties is made up of friends and acquaintances. Friendship ties have larger networks and tend to be less connected than family intensive networks which are smaller and more connected.

Immediate family and extended family ties are based on kin relationships. Friends and acquaintances are non-kin ties. Each personal network studied for this thesis was composed of a proportion of the four types of ties: the immediate family members, the extended family members, friends and acquaintances.

**Centrality.**

Borgatti et al. (2009) noted that centrality was the most widely studied and used concept of social network analysis. Centrality refers to properties of individuals relating to the structural importance or prominence of their positions in the communications network. These properties help to identify the individuals who are central or isolated in social networks. Network centrality and density are important because they influence the amount of interaction a person has with members of the network (Wright, 2008). Three common measures of centrality developed by Freeman (2004) are degree of centrality (that is the actor with the most lines of connections in the network, closeness (describes the way in which actors are closely or loosely to others in social structure, betweenness (the extent to which an actor sits between others in the network) and eigenvector describes how much of the pattern of the network structure reflects the global pattern. In the current study, closeness, as described by Marsden and Campbell (1984), was chosen to measure the strength of relationships between ego and network members.
**Closeness.**

Closeness is one of the integration positions ascribed to social network actors. It is the position a network member has that is closer in comparison with others to quickly and more easily connect with others (Ortiz, Hoyos, & Lopez, 2004). Ortiz et al. (2004) define closeness as the shortest path that connects a member to the central actor in a network. Closeness in social networks is used as a measure for intensity of a relationship. Marsden and Campbell (1984) used closeness to represent intimacy of a relationship.

In this study, I define closeness as a characteristic of social networks that describes a confidante, the network member (alter) that one can confide in for help in an emergency (Stokes & Wilson, 1984). The measurement of closeness in this study was based on the interpretation of the participants’ own perceptions and judgments of each network member on a 5-point Likert scale. Closeness was regarded as an index for mutual confiding, intensity of tie strength and depth of relationship (Marsden & Campbell, 1984).

**Frequency of contact.**

Granovetter (1973) proposed taking frequency of contact as one of a variety of measures for strength of ties. Frequency of contact measures the number of times network members communicate. Frequency of contact has important effects on the behavior of the network members and group functioning (Sih, Hanser, & McHugh, 2009). Sih et al. (2009) noted that the frequency of interaction between nodes provides a way of quantifying relationships among network members. Krause et al. (2007) found that understanding the behavior of network members depends on the frequency of contact of the focal person with other members. The speed in the flow of information in a network will depend in part on the frequency of contact which network members have with each other.
Resource exchange.

Resource exchange refers to the flow of resources between the focal person and members of the network (Silverman et al., 2008). In social networks, resources include love, status, social support, information, money, goods, and services (Abbott, 1990). Silverman and colleagues have classified resources into three major categories: material, emotional and informational support. Resource exchange between individuals within a network is examined not from individual attributes, but on relationships between social networks members within the environment in which individuals are embedded (Silverman et al., 2008). The node’s position in a network determines, in part, the opportunities and constraints accessible to network members in the distribution of resources.

Access to resources also depends on the ability of the individual network members to know how to make connections with others who have resources available. Exchange of resources can only take place when resources exist. If there are no valued resources or when resources run out, no resource exchange will take place. Relations in a network are defined on the basis of the content of resources that travel from one actor to another. The strength of ties has effects on the reciprocal exchange of resources between actors. There is likely to be more resource exchanges between stronger network ties than between weak ones. “The strength of ties theory” (Granovetter, 1973) suggests that weak ties are sources of new and important information resources that often cannot be obtained from strong ties. However, it is common that most of the social influence is carried through strong ties (Grannerman, 2006).

Density.

Density is the measure of connectedness among all network members. It describes the proportion of actual-occurring relationships compared to the number of theoretically-possible
relationships or ties of network members or groups such as friendship, family or acquaintance (Harary, 1969; Wright, 2008).

Wright (2008) argued that weak tie support networks have low density because they are infrequently maintained and non-intimate. Many of the possible relational links in weak ties are not present. Strong tie social support networks have greater density because of the intensity of their presence connectedness. Close friends constitute a higher density network that is tightly held together compared to networks made up of acquaintances who are loosely connected (Granovetter, 1983).

Disclosure of risky topics and access to more objective viewpoints are easier in low density networks due to less emotional attachment among members. Low density networks tend to show fewer role obligations among network members (Wright, 2008). There is a tendency to avoid self-disclosure of risky topics in high density networks because members in close knit networks are more likely to spread confidential information to the public. On the other hand, high density networks facilitate greater social support obligations among network members (Wright, 2008).

As can be seen, social network influence on help-seekers will depend on a number of factors. Some information resources are more easily available to some network members than to others. First, this is because access to resources depends on the interaction individuals have with other network members. Second, close friends and family members are more likely to be limited in the range of information they may receive from outside. The information that exists between close members and family members about new innovations is likely to be redundant (Granovetter, 1983). Third, social capital is strongly embedded in a cultural context. Sensitive
topics such as HIV often cannot be discussed openly with other social network members at the
time when help is required (Wright, 2008).

Social Network Analysis and the Study of HIV/AIDS

Valente (2010) found that HIV/AIDS presents an important area for social network research. Klovdahl (1985) and Klovdahl et al. (2001) used social network analysis to demonstrate that HIV was spread through sexual networks. From his study, he noted that improved travel technology created conditions for the increase of global epidemics. Understanding social network structures improved the knowledge of the HIV/AIDS transmission.

Some studies have shown how networks were providing routes through which the spread of HIV/AIDS was transmitted (Morris, 1995, 2004; Rothenberg et al., 1998). Bettinger, Adler, Curriero, and Ellen (2004) found that core and bridge adolescents did not perceive themselves at greater risk for HIV infection than isolates in social networks and as a result they were less likely to use condoms. Mathematical models and computer simulations have begun to be used to trace the spread of the HIV/AIDS epidemic (Anderson & May, 1991; Wallace, 1994). Studies aiming to identify people with undiagnosed HIV for HIV testing have been going on for a number of years in the health sector. Health personnel have asked individuals diagnosed with HIV to recruit their sexual partners or provide their contact information for HIV testing. Many people with HIV have been reached through network channels for testing and HIV counseling services. Valente, Hoffman, Ritt-Olson, Lichtman, and Johnson (2009) have used social network analysis to determine sites that could be used to create clinics in areas known to be high-risk HIV zones.
Contact tracing of infectious and communicable diseases has been conducted in the health sector for decades (Aral & Holmes, 1999; Klovdahl et al., 2001). The dissemination of health promotion information in hard-to-reach communities has improved greatly through the use of social network methods. Valente (1995) pointed to the models of the diffusion of innovations as one example of social network application in the public health field.

In program planning, Heckathorn, Anthony, and Weakliem (1999) compared results of a network-based HIV prevention intervention with the standard form of street-based outreach intervention. The results showed that the network intervention outperformed the standard approach in the level of HIV risk reduction. Amirkhanian, Kelly, Kabakchieva, McAuliffe, and Vassileva (2003) used social network analysis to study young men who have sex with men in Russia. Latkin et al. (2009) found that injection drug users (IDUs) in dense networks shared needles more frequently than those in less dense networks. Social network research continues to be applied in public health.

Conclusion

Network theory asserts that individual attitudes, beliefs, and behaviors are influenced by the attitudes, beliefs and behaviors of others. Social networks are channels through which people access information about the help and advice they need when they are experiencing challenges to their health. Social networks provide a source of social capital including information, material and emotional support. Information available in networks provides knowledge of how certain tasks are performed.

Social networks provide role models for people to change behavior when someone they know has done so. Finally, facing life alone fosters a sense of isolation and despair that only
deepens when confronted with life’s difficult challenges. In contrast, the strength of networks manifests in the joy, sense of acceptance, and resources experienced as part of relationships with others (Uchino, 2004).

Perhaps the commonest criticism about social network research is that the social network construct lacks a theoretical base. Borgatti et al. (2009) found that social network research was merely descriptive or just a methodology when compared to approaches used in the physical sciences including biology. Social scientists have argued that network research seemed to be too simplistic and caught up in some tiny data sets (Valente, 2010). Tomas Valente argued that social network analysis is a perspective or paradigm. Social network methods are ways of just looking at social problems not theory, he added.

Unlike a theory, social networks in research do not provide premises from which to build hypotheses or predictions. Social network analysts care about social structure and not about the individual for explaining the constraints, opportunities and perceptions created by network positions (Marin & Wellman, 2009). Marin and his colleague added that social network methods are not sufficient to explain how organizations can ensure success or explain who in the networks is likely to live a long and healthy life. Social network approaches skirt issues such as problems of inequality, and questions of relations within and between classes which are important social research questions. They noted that network analysis only provided vague answers to some of the questions in the social sciences. They only guide research where to look for answers.

There is also concern about sociometric techniques used in social network studies. In egocentric data, the techniques were only applicable to studies with populations in settings that
have natural boundaries such as schools, organizations, and small countries and lack some of the strength of random sampling of research designs for wider areas of study.

Whether social networks are a theory or not, is not an important question. The important fact to note is that, social network research offers a more complete perspective in understanding the way social systems and people are connected and evolve (Valente, 2010). The social network theory offers understanding of the role and function of social network influence on behavior. By using social network theory in this study, I would like to contribute knowledge of how social networks influence individuals to test for HIV to the literature.
CHAPTER 4: METHODS

Research Questions

This chapter will discuss the research design and methods that I used to evaluate the influence of social networks on first-generation African-Canadian immigrants’ decisions to be tested for HIV.

This study was to answer two questions:

1. What types of social network relationship ties influence individuals’ decision to test for HIV?

2. Why and how do types of social network relationship ties influence individuals’ decisions to test for HIV?

Research Design

This study was retrospective with primary data collection from participants who already had had HIV testing. A mixed method approach was applied. Mixed method approaches combine qualitative and quantitative techniques into the research methodology of a single or multi-phased study (Creswell, 2008). Data from the two techniques for this mixed methods study were collected simultaneously through interviews. The quantitative method was designed to collect numbers and the qualitative method was designed to collect expressions of personal experiences from participants (Collins & O’Cathain, 2009). The mixed methods design provided the rigor needed in investigations. The use of the mixed method design in this study provided complementary data on the individuals’ decisions to get HIV testing. The collection of data was
done through a single interview with each individual participant. The participants were asked detailed questions about their social networks and to retrospectively describe the role of their network members in influencing their decision to be tested for HIV.

A thematic analysis of the qualitative descriptions of the network members’ influence in the individuals’ decisions to get HIV testing was performed. Data collected from the two research techniques were merged into one coherent whole that was analyzed and interpreted as a single data set for the study.

**Participants**

All the 62 female and male participants were residents of the Greater Toronto Area (GTA), at least 18 years old African and Caribbean individuals who had had voluntary HIV testing in the past either in Canada or their countries of origin. Exclusion of participants who had taken mandatory HIV testing or testing for prenatal requirements was important to avoid confounding research findings.

Mandatory HIV testing before entering Canada is used for screening immigrants and refugees aged 15 years and above from countries in the African and Caribbean regions that have high rates of HIV (Public Health Agency of Canada, 2005). Prenatal testing for HIV of women is for the prevention of HIV transmission from mothers to children.

Age and gender were important variables in this study. Research indicates that approximately 50% of all HIV/AIDS infections were in the 15 to 24 years age group (United Nations Population Reports, 2005). The report also noted that young women between 15-24 years were 1.6 times as likely as young men to be HIV positive. In the report, biological vulnerability of females to infection was noted as the cause for the higher numbers of young
women infected with HIV than young men. Socio-cultural norms and gender inequalities were also given as the important factors for making young women more vulnerable to HIV than young men. In this study, income and education were not considered as variables for investigation because there was a limited range among participants. All the participants had college or university education; nearly all participants were supported by the Ontario Disability Support Program (ODSP) for their survival in Canada.

**Recruitment of Participants**

The study was conducted in the Greater Toronto Area with the approval and support of the African and Caribbean Council on HIV/AIDS in Ontario (ACCHO), a partnership of HIV agencies established to work with African and Caribbean communities in Ontario (see Appendix A). Six agencies were approached about the study (the letter to the agencies is provided in Appendix B). Two agencies served only women and, although one provided feedback about the interview questions, both suggested that the study could be better done with an agency that served both men and women. A third agency declined to participate because it was already involved in a study with another university. A fourth agency also provided suggestions about the interview questions. The remaining two agencies Black Cap and Africans in Partnership against AIDS expressed interest in participating. Of these two agencies, the Africans in Partnership against AIDS (APAA), a Toronto-based non-profit organization that provides education and support to African-Canadians with HIV/AIDS, was selected because it provided written consent to assist with recruitment, provided office accommodation for research interviews and meetings. APPA agreed to make available counselling services to participants when needed.
APAA posted flyers about the study in its offices and some of APAA’s outreach workers transmitted information to clients about the study (see Appendix C). Volunteers who wanted to participate were directed to telephone the researcher’s number to set up an interview appointment. Out of the 65 volunteers contacted, 62 were interviewed. (The other three volunteers contacted were unable to find a mutually-convenient time for an interview.) All participants were either recruited directly through APAA or through other participants (the latter is a form of chain referral or snowball sampling (Salganik & Heckathorn, 2004). All participants were offered an honorarium of $25.

**Ethical issues.**

Data collection from HIV-positive participants can be highly sensitive and potentially traumatizing. To minimize the risk to participants, it was important that the study take place at a facility with professional counselling staff on site that could support participants if they found the interview questions upsetting. The researcher was also available to respondents after the interview, should they request an opportunity to provide feedback or wish to discuss their experience in the study. Participants were advised that their responses were confidential and that they could withdraw from the study at any time. The data were stored in a locked cabinet in the researcher’s residence. In addition to the researcher, the only other people with access to the data were the thesis committee members.

**Interview protocol.**

Each interview was conducted by the researcher using a structured interview protocol. The interview was conducted at a time and place that was convenient for the participants. Most interviews took place in the APAA offices, but some were in participants’ homes and at the
Ontario Institute for Studies in Education, University of Toronto. The interview took about an hour and began with the participant receiving and completing a consent form (see Appendix D).

The interview protocol for data collection consisted of the name generating, name interpreting, position generating and resource generating measurement instruments adapted from Silverman et al. (2008). The participants were asked to name at least ten important people with whom they discussed important personal issues in life or they asked for advice at the time when they decided to get HIV testing.

Information about the relationship of the participant with each member of the network, sex of each network member, the duration the social network member was known to the participant and the type of social activities the participant was engaged with each member was obtained. Finally, the participants were asked to name the social network member who influenced their decision to get HIV testing. (Appendix E provides the complete interview protocol and Table 17 summarizes the themes.)

Table 2 summarizes the types of information collected by the interview protocol. It also indicates the sources from which each set of items was adapted.
## Table 2

**Content and Development of the Structured Interview**

<table>
<thead>
<tr>
<th>Category</th>
<th>Variables</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Background information</td>
<td>Participant’s age, country of birth, sex, education, employment status, when first tested, whether they have been tested in Canada, reasons for being tested, income</td>
<td>These questions were developed specifically for this study.</td>
</tr>
<tr>
<td>2. Members of participant’s social network</td>
<td>List of ten network members</td>
<td>Participants were asked to list ten people with whom they might have “discussed important issues or asked for advice” and to include family members if relevant. The approach to generating the network members was adapted from Flap, Snijders, Volker, &amp; van der Gaag (2000) study of Dutch social networks and Silverman et al.’s (2008) interviews with Taiwanese and American older adults.</td>
</tr>
<tr>
<td>3. Characteristics of each social network member</td>
<td>Each network member’s sex, age, years known, relationship to participant, marital status, education, occupation, country of origin</td>
<td>The matrix of network members’ characteristics was also adapted from Silverman et al. (2008).</td>
</tr>
<tr>
<td>4. Types of support from each social network member</td>
<td>Each network member’s provision of specific types of instrumental (material/service), informational, and emotional support</td>
<td>The list of types of support was based on Wellman (1981), Uchino (2004), and Silverman et al. (2008).</td>
</tr>
</tbody>
</table>
The data collected through these instruments encompassed the aspects of social network theory that give insights into the influence of social networks in the individuals’ decision to test for HIV. After a review of the responses in the first ten interviews, a few additional questions (see questions 12 to 18 in the questionnaire guide) about the influence of network members on the participants’ decisions to be tested were added for the remaining interviews. Questions 14 and 15 are examples of the questions that were added to the questionnaire.
14. Why did you go to these people and not to others for advice to get HIV testing?

15. Who else did you go to for advice to get HIV testing?

**Preparing the Data for Analysis**

During each interview, the researcher marked the participant’s answers and took detailed notes on a copy of the interview protocol. Each protocol was coded with a unique identification number (ID). After the interviews, the researcher entered the quantitative data into an Excel spreadsheet and also typed a summary of each respondent’s responses to the open-ended questions. Some of the interviews were tape recorded and notes were also typed from the recordings. In this study, the summaries were not confirmed with the participants.

The researcher wrote field notes after some of the interviews. These notes included the researcher’s impressions of the participants’ emotional states and of their social and family situations.

**Computing network density.**

In a 10-member network, there are 45 possible ties among the members; for example, member 1 may or may not know member 2, etc. Each participant was asked “Does person number 1 know person number 2?” and so on. The density of each participant’s network was calculated as the proportion of the possible ties to which the participant answered “yes.” Density measures the proportion of network members that are connected with each other (Burt, 1998). The more all network members are tied to each other, the less the chance there is for a network member to receive new information from other members. Their knowledge will be redundant and limited.
Data Analysis

Quantitative analyses.

SPSS 16.0 was used to manage and analyze the quantitative data. Descriptive statistics were computed for the characteristics of the participants and their networks. Analyses of variance (ANOVA) and \( t \)-tests were performed to compare the network characteristics across subgroups of participants and across types of networks (see Tables 9, 11). The tests compared the differences among the means representing the four network types of social network ties. Independent-samples \( t \)-tests were conducted to assess the relationship of the social network variables with social support. Evidence of independent-samples \( t \)-tests are shown in Tables 8, 9, 11, and 12. Chi-square tests were conducted to compare the influence of family members, extended family members, friends and acquaintances in HIV testing, although the sample size was not large enough to make any statistically sound distinction. Tables 14 and 15 showed the different effects of immediate and extended family members, friends and acquaintances by gender and by age on HIV testing.

Qualitative analysis.

Analyses of the participants’ responses to the open-ended questions were informed by the research questions, with a focus on aspects of participants’ social networks and the influence of their social networks that were not in the quantitative data. These aspects led to the generation of five questions or themes to guide the analyses:

1. What influenced who is in the participant’s social network?
2. Who influenced the participant’s decision to be tested?
3. Why was that person or were those people influential?
4. How did the participant think their being tested might affect other network members?

5. What other factors and circumstances influenced the participant’s decision to be tested?

An iterative approach was taken to coding. The researcher read all the interview notes once and listed codes in the stated themes, as they occurred in the interviews. The notes were then reread several times and the researcher looked for evidence of all codes across all interviews. The codes were then re-examined and some codes were combined or relabelled to produce a final set of codes organized by the five themes.

**Summary of Chapter**

This chapter reviewed the design and methods used in the research. A concurrent mixed method approach was applied to explore how social networks influenced individuals seeking to get HIV testing. Both qualitative and quantitative data were collected simultaneously through interviews.

The interview that included quantitative assessment of the types and amount of social support received by the individuals was conducted. The items in the questionnaire referred to help with information, emotional and material support obtained from immediate family members, extended family members, friends and acquaintances. By adding some open-ended questions, the researcher was able to use the questionnaire for both quantitative and qualitative inquiry.

It was possible to assess the influence of social networks in the individuals’ decisions to get HIV testing from both the quantitative and qualitative data. The quantitative approach was used for statistic calculations to answer the research question of what influence social network
ties have in the individuals’ decisions to get HIV testing. The quantitative technique used some data that were already considered for exploring the experiences of the research participants in deciding to get HIV testing.

Interviews were tailored to the research goal and interest. The qualitative inquiry was used to widen the net for capturing the data that quantitative methods of the research would not have managed to capture. Some factors that influence individuals’ decisions to get HIV testing could be understood fully through qualitative research. The mixed method approach was used in the current study so that the overall findings would have more strength and credibility than if either quantitative or qualitative research were used alone (Creswell & Plano Clark, 2007).
CHAPTER 5:
RESULTS

In this chapter, results of both the quantitative and the qualitative analyses are presented. The results are organized according to the research questions to examine how social networks influence the decision to have HIV testing. Quantitative and qualitative analyses address both research questions in this study. The findings from the two types of analyses complement each other in addressing the questions of interest.

Quantitative Findings

This study involved a sample of participants from the Caribbean, Northern Africa, Eastern Africa, Western Africa and Southern Africa. These regions, with the exception of Northern Africa, are identified as HIV-endemic countries with high rates of HIV/AIDS (Remis & Whittingham, 1999). Therefore, the participants from these regions were considered for this study to explore the possible link between the influences of social networks of the individuals’ decisions in getting HIV testing.

Table 3 summarizes the characteristics of the 62 participants of this study. Recall that all participants were at least 18 years old, had immigrated to Canada from Africa or the Caribbean, and had had voluntary HIV testing in the past either in Canada or their countries of origin. Since the participants were not asked, whether they are HIV positive or not, this information is not available.
Table 3

**Characteristics of the Participants**

<table>
<thead>
<tr>
<th></th>
<th>Female(^a) (N = 33)</th>
<th>Male (N = 29)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Percent</td>
<td>N</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-24 years</td>
<td>9</td>
<td>27.3%</td>
<td>12</td>
</tr>
<tr>
<td>25-34 years</td>
<td>15</td>
<td>45.5%</td>
<td>7</td>
</tr>
<tr>
<td>35-49 years</td>
<td>9</td>
<td>27.3%</td>
<td>10</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caribbean</td>
<td>6</td>
<td>18.2%</td>
<td>12</td>
</tr>
<tr>
<td>Eastern Africa</td>
<td>15</td>
<td>45.5%</td>
<td>9</td>
</tr>
<tr>
<td>Northern Africa</td>
<td>0</td>
<td>0.0%</td>
<td>3</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>12</td>
<td>36.4%</td>
<td>3</td>
</tr>
<tr>
<td>Western Africa</td>
<td>0</td>
<td>0.0%</td>
<td>2</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
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</tr>
<tr>
<td>Secondary</td>
<td>9</td>
<td>27.3%</td>
<td>5</td>
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<td>College or University</td>
<td>24</td>
<td>72.7%</td>
<td>23</td>
</tr>
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<td><strong>Work Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>3</td>
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<td>3</td>
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<tr>
<td>Part-time</td>
<td>9</td>
<td>27.3%</td>
<td>11</td>
</tr>
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<td>Student</td>
<td>8</td>
<td>24.2%</td>
<td>12</td>
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<tr>
<td>Retired</td>
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<td>3.0%</td>
<td>1</td>
</tr>
<tr>
<td>Unemployed</td>
<td>12</td>
<td>36.4%</td>
<td>2</td>
</tr>
<tr>
<td><strong>Income</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Less than $10,000</td>
<td>26</td>
<td>78.8%</td>
<td>17</td>
</tr>
<tr>
<td>$10,000-$19,999</td>
<td>5</td>
<td>15.2%</td>
<td>3</td>
</tr>
<tr>
<td>$20,000-$29,999</td>
<td>0</td>
<td>0.0%</td>
<td>3</td>
</tr>
<tr>
<td>$30,000-$39,999</td>
<td>1</td>
<td>3.0%</td>
<td>4</td>
</tr>
<tr>
<td>$40,000-$49,999</td>
<td>1</td>
<td>3.0%</td>
<td>1</td>
</tr>
<tr>
<td>More than $50,000</td>
<td>0</td>
<td>0.0%</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note.* \(^a\) The gender category female includes two individuals who were born male (i.e., male-to-female transsexuals). Income here referred to household earnings.
As can be seen from Table 3, the sample used in this study had a balanced gender (53% males and 47% females) and age composition. The age of participants ranged between 16 years old and 49 years old with majority of the participants (69.4%) being younger than 34 years old. The sample of female participants was somewhat younger than the sample of male participants.

The composition of the overall sample by region was unbalanced: majority of the participants were from Eastern Africa (38.7%), Caribbean (29.0%), and Southern Africa (24.2%), while Northern and Western Africa were less represented (4.8% and 3.2%, respectively). The distribution by region also varied for male and female participants. While majority of female participants were from Eastern and Southern Africa, majority of male participants were from the Caribbean and Eastern Africa. HIV infection rate is low in Northern and Western Africa in comparison to the rest of the countries on the continent (UNAIDS/WHO, 2005), and this may be the reason why the call for this study attracted smaller number of people from these regions.

Education level is an important characteristic of the sample participants as persons with different education levels are likely to have different personal networks that provide individuals with access to HIV information and help (Veinot, 2009). Most of the participants were well educated with 75.8% being either college or university graduates. Only 1.6% had an elementary education alone. The distribution by education level was similar in both gender groups. In spite of this relatively high level of education in the sample, 36.4% of the women and 6.9% of men were unemployed. Majority of participants of both genders were either students or employed part-time.

Table 3 also shows that 69.4% of the participants earned less than $10,000 per annum, which is below the Low Income Cut-Off (LICO) for Canada. Only 1.6% of the participants
earned more than $50,000 per annum. The majority were on the Ontario Disability Support Program (ODSP).

Results presented in Table 4 indicate that the age distribution of the participants varied by region of origin. Among participants originating from the Caribbean, 61.1% were between 16-24 years of age. The participants from the other regions were somewhat older: majority of participants from Eastern and Southern Africa were between 25-49 years of age and two of the three participants from Northern Africa were in the 35-49 years group.

Table 4

Age of Participants by Region

<table>
<thead>
<tr>
<th>Age</th>
<th>Caribbean (N = 18)</th>
<th>Eastern Africa (N = 24)</th>
<th>Northern Africa (N = 3)</th>
<th>Southern Africa (N = 15)</th>
<th>Western Africa (N = 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-24 years</td>
<td>11 61.1%</td>
<td>4 16.7%</td>
<td>1 33.3%</td>
<td>4 26.7%</td>
<td>1 50.0%</td>
</tr>
<tr>
<td>25-34 years</td>
<td>4 22.2%</td>
<td>13 54.2%</td>
<td>0 0.0%</td>
<td>5 33.3%</td>
<td>0 0.0%</td>
</tr>
<tr>
<td>35-49 years</td>
<td>3 16.7%</td>
<td>7 29.2%</td>
<td>2 66.7%</td>
<td>6 40.0%</td>
<td>1 50.0%</td>
</tr>
</tbody>
</table>

Of all participants in this study, one female was HIV tested only in Canada as she was born in this country. All participants, with the exception of this one, had their first voluntary HIV testing in countries of their origin before immigrating to Canada, although some of them also got HIV testing after their arrival in Canada. Participants who had been tested only for immigration or prenatal screening purposes were excluded from the study.
Table 5 gives the breakdown of HIV testing in the sample by time period. As can be seen from this table, all but 3 participants had HIV testing after the discovery of antiretroviral (ARV) therapy in 1995. The majority had HIV testing between 2000 and 2004 when treatment became accessible to some patients who needed it in a number of developed countries where there are better health care services. A few were tested in hospital for HIV screening under severe medical conditions.

Table 5

<table>
<thead>
<tr>
<th>Year of First HIV Test</th>
<th>Location</th>
<th>Only in Canada or In Canada and Outside</th>
<th>Outside Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(N = 46)</td>
<td>(N = 16)</td>
</tr>
<tr>
<td>Female (N = 21)</td>
<td>Male (N = 25)</td>
<td>Female (N = 12)</td>
<td>Male (N = 4)</td>
</tr>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Before 1995</td>
<td>0</td>
<td>0.0%</td>
<td>1</td>
</tr>
<tr>
<td>1995-1999</td>
<td>4</td>
<td>19.0%</td>
<td>4</td>
</tr>
<tr>
<td>2000-2004</td>
<td>4</td>
<td>19.0%</td>
<td>9</td>
</tr>
<tr>
<td>2005-2009</td>
<td>13</td>
<td>61.9%</td>
<td>11</td>
</tr>
</tbody>
</table>

Table 6 shows the composition of networks by gender of the participants. Network composition differed with respect to the proportions of immediate and extended family members, friends and acquaintances and this composition also differed by gender. A typical network of female participants would include 4-5 immediate family members and 3-6 friends, while
extended family members and acquaintances are not likely to be part of their network. Two patterns of networks can be observed for male participants. For about 25% of male participants had their entire 10-member network consisting of only friends. The rest of the participants have networks consisting of few immediate and extended family members, some friends and up to one acquaintance. Only 3.2% of the participants did not have friends in their networks. It is more common for people of African and Caribbean origin to discuss sex or HIV/AIDS issues with friends than with family members. Talking about sex with parents is taboo in some cultures.

Table 6

Composition of Network (10-Member Networks*) by Gender

<table>
<thead>
<tr>
<th></th>
<th>Female (N = 33)</th>
<th></th>
<th>Male (N = 29)</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>Number of Immediate Family Members</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>3</td>
<td>9.1%</td>
<td>10</td>
<td>34.5%</td>
<td>13</td>
<td>21.0%</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>9.1%</td>
<td>4</td>
<td>13.8%</td>
<td>7</td>
<td>11.3%</td>
</tr>
<tr>
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<td>4</td>
<td>12.1%</td>
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<td>10.3%</td>
<td>7</td>
<td>11.3%</td>
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<td>10.3%</td>
<td>6</td>
<td>9.7%</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>24.2%</td>
<td>3</td>
<td>10.3%</td>
<td>11</td>
<td>17.7%</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>21.2%</td>
<td>2</td>
<td>6.9%</td>
<td>9</td>
<td>14.5%</td>
</tr>
<tr>
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<td>3.0%</td>
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<td>3.4%</td>
<td>2</td>
<td>3.2%</td>
</tr>
<tr>
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<td>6.9%</td>
<td>3</td>
<td>4.8%</td>
</tr>
<tr>
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<td>3.4%</td>
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</tr>
<tr>
<td>9</td>
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</tr>
<tr>
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<td>0.0%</td>
<td>1</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

Number of Extended Family Members

<table>
<thead>
<tr>
<th></th>
<th>Female (N = 33)</th>
<th></th>
<th>Male (N = 29)</th>
<th></th>
<th>Total</th>
<th></th>
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<tr>
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<td>Percent</td>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>0</td>
<td>19</td>
<td>57.6%</td>
<td>13</td>
<td>44.8%</td>
<td>32</td>
<td>51.6%</td>
</tr>
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<td>15.2%</td>
<td>4</td>
<td>13.8%</td>
<td>9</td>
<td>14.5%</td>
</tr>
<tr>
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<td>3</td>
<td>9.1%</td>
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<td>17.2%</td>
<td>8</td>
<td>12.9%</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0.0%</td>
<td>3</td>
<td>10.3%</td>
<td>3</td>
<td>4.8%</td>
</tr>
<tr>
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<td>9.1%</td>
<td>1</td>
<td>3.4%</td>
<td>4</td>
<td>6.5%</td>
</tr>
<tr>
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<td>6.9%</td>
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</tr>
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<tr>
<td>7</td>
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<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
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</tbody>
</table>
Female ($N = 33$)          Male ($N = 29$)          Total

<table>
<thead>
<tr>
<th>N</th>
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**Number of Friends**

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**Number of Acquaintances**

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<th>Percent</th>
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<tr>
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<td>1</td>
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<td>1.6%</td>
</tr>
<tr>
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<td>0.0%</td>
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<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

*Note.* One participant named only 7 network members; a second named only 8; the rest named 10 members.

The composition of network by age group is shown in Table 7. A few patterns can be observed in this table. Younger participants are likely to have fewer immediate family members and more extended family members in their networks comparing to older participants. The
patterns are similar for the three age groups with regards to the number of friends and acquaintances.

Table 7

Composition of Network (10-Member Networks\(^a\)) by Age

<table>
<thead>
<tr>
<th>Number of Immediate Family Members</th>
<th>16-24 years (N = 21)</th>
<th>25-34 years (N = 22)</th>
<th>35-49 years (N = 19)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>0</td>
<td>4</td>
<td>19.0%</td>
<td>5</td>
<td>22.7%</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>14.3%</td>
<td>2</td>
<td>9.1%</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>19.0%</td>
<td>2</td>
<td>9.1%</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>19.0%</td>
<td>2</td>
<td>9.1%</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>14.3%</td>
<td>2</td>
<td>9.1%</td>
</tr>
<tr>
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<td>4</td>
<td>18.2%</td>
</tr>
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</tr>
<tr>
<td>7</td>
<td>0</td>
<td>0.0%</td>
<td>3</td>
<td>13.6%</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>4.8%</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>9</td>
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<td>0.0%</td>
<td>1</td>
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<tr>
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</table>

<table>
<thead>
<tr>
<th>Number of Extended Family Members</th>
<th>16-24 years (N = 21)</th>
<th>25-34 years (N = 22)</th>
<th>35-49 years (N = 19)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
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<td>28.6%</td>
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<td>4.5%</td>
</tr>
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<td>14.3%</td>
<td>2</td>
<td>9.1%</td>
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<tr>
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<tr>
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<tr>
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</tr>
<tr>
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<td>16-24 years ( (N=21) )</td>
<td>25-34 years ( (N=22) )</td>
<td>35-49 years ( (N=19) )</td>
<td>Total</td>
</tr>
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<td>-------</td>
</tr>
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<td></td>
<td>( N )</td>
<td>%</td>
<td>( N )</td>
<td>%</td>
</tr>
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<td><strong>Number of Friends</strong></td>
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<td></td>
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<td>4.8%</td>
<td>2</td>
<td>9.1%</td>
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<td>23.8%</td>
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</tr>
</tbody>
</table>

*Note.* One participant named only 7 network members; a second named only 8; the rest named 10 members.
Are Characteristics of Network Structure Related to Gender and Age?

Characteristics of network structure.

Social networks analysis allows for a quantitative description of network structure. The social network consists of a set of members with a system of relationships (Ortiz et al., 2004). Network relationships are seen as links (“ties”) between network members. Ties between network members are the data used for analyzing social networks (Ortiz et al., 2004).

Characteristics of social networks that influence the decisions that individuals make to get HIV testing include among others, network density, frequency of contact with network members, number of kin members and closeness to members of the social network (Wright, 2008). Density determines the existence of weak or strong social network ties in a network. Dense networks would be highly connected and more cohesive than networks that were less dense. Granovetter (1983) argued that low density networks were more influential because they were more open to discussion of sensitive topics than high density networks. Closeness refers to the member one can confide in or turn to for help in an emergency (Stokes & Wilson, 1984).

In this study, closeness was measured by simply asking participants to rate their confidants on a five-point Likert Scale. Closeness of members of the social network and frequency of contact facilitate the exchange of vital information that is needed in making important decisions such as getting HIV testing. A person one can confide in during difficult times or a confidante has strong social network influence in the individuals’ decision making. However, the influence of social networks in the individuals’ decisions to get HIV testing also depends on a variety of other conditions such as time perspective and limitations of one type of network tie in a particular situation.
Analysis of characteristics of social networks by gender.

Table 8 summarizes the descriptive statistics for the five characteristics of social networks for male and female participants. As can be seen from this table, male and female participants in this sample have similar density and average closeness in their network. However, male participants in the sample know their network members longer, while female participants contact their network members more often and have a higher proportion of family members in their networks. To evaluate whether the patterns observed in the sample can be generalized to the population of interest, independent-samples \( t \)-tests were conducted. The results are following.

<table>
<thead>
<tr>
<th>Network Characteristics by Gender</th>
<th>Female (( N = 33 ))</th>
<th>Male (( N = 29 ))</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( M )</td>
<td>( SD )</td>
<td>( M )</td>
</tr>
<tr>
<td>Density(^a)</td>
<td>.73</td>
<td>.23</td>
<td>.78</td>
</tr>
<tr>
<td>Average frequency of contact(^a)</td>
<td>4.04</td>
<td>0.46</td>
<td>3.66</td>
</tr>
<tr>
<td>Average number of years known</td>
<td>13.25</td>
<td>6.61</td>
<td>16.00</td>
</tr>
<tr>
<td>Average proportion family members</td>
<td>.51</td>
<td>.27</td>
<td>.40</td>
</tr>
<tr>
<td>Average closeness(^a)</td>
<td>3.96</td>
<td>0.41</td>
<td>3.66</td>
</tr>
</tbody>
</table>

Note. Frequency of contact was rated on a 5-point scale (1 = Never, 2 = Occasionally, 3 = Monthly, 4 = Weekly, and 5 = Daily). Closeness was rated on a 5-point scale (1 = Very Distant, 2 = Distant, 3 = Somewhat Close, 4 = Close, 5 = Very Close).

\(^a\)Three participants did not provide network density, contact, or closeness information.
**Density.** The results presented in Table 9 demonstrate that while 28.6% male participants had the highest possible density score of 1.0, 19.4% of female participants had this density score. To evaluate whether the network density is different for males and females, an independent-samples \( t \)-test was conducted. The results of this test were not significant, \( t (57) = -0.82, p = .40 \), indicating that the network density on average is similar for males and females. The average density for females in the sample was .73 (SD. = .23) and for males it was .78 (SD. = .2). The 95% confidence interval for the difference in means was narrow ranging from - .16 to .07.

**Table 9**

**Density of Network (10-Member Networks\(^a\)) by Gender**

<table>
<thead>
<tr>
<th>Proportion of connections (out of a possible 45)</th>
<th>Female (( N = 31^b ))</th>
<th>Male (( N = 28^b ))</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( N )</td>
<td>Percent</td>
<td>( N )</td>
</tr>
<tr>
<td>0.0</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>0.1</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>0.2</td>
<td>1</td>
<td>3.2%</td>
<td>0</td>
</tr>
<tr>
<td>0.3</td>
<td>2</td>
<td>6.5%</td>
<td>0</td>
</tr>
<tr>
<td>0.4</td>
<td>1</td>
<td>3.2%</td>
<td>3</td>
</tr>
<tr>
<td>0.5</td>
<td>2</td>
<td>6.5%</td>
<td>1</td>
</tr>
<tr>
<td>0.6</td>
<td>6</td>
<td>19.4%</td>
<td>6</td>
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<tr>
<td>0.7</td>
<td>2</td>
<td>6.5%</td>
<td>1</td>
</tr>
<tr>
<td>0.8</td>
<td>4</td>
<td>12.9%</td>
<td>3</td>
</tr>
<tr>
<td>0.9</td>
<td>7</td>
<td>22.6%</td>
<td>6</td>
</tr>
</tbody>
</table>
Proportion of connections (out of a possible 45)  

<table>
<thead>
<tr>
<th></th>
<th>Female (N = 31(^b))</th>
<th>Male (N = 28(^b))</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>1.0</td>
<td>6</td>
<td>8</td>
<td>14</td>
</tr>
</tbody>
</table>

*Note.* \(^a\)One participant named only 7 network members; a second named only 8; the rest named 10 members. \(^b\)Three participants (2 females and 1 male) did not provide network density information.

**Average frequency of contact.** An independent-samples *t*-test was conducted to evaluate whether the average frequency of contact differed by gender. The test was significant, *t*(57) = 2.84, *p* < .01. The average number of contacts for females (M = 4.04, SD .46) is significantly higher than for males (M = 3.66, SD = .57). The 95 confidence interval for the difference in means was quite narrow, averaging from .11 to .65.

**Average number of years known.** An independent samples *t*-test was conducted to evaluate whether the number of years respondents know their contacts differed by gender. The test was not significant, *t*(60) = -1.25, *p* = .22. The average number of years known for females (M = 13.24, SD. = 6.61) was not significantly lower than for males (M = 15.99, SD. = 10.52). The 95% confidence interval for the difference in means was quite wide ranging from -7.16 to 1.66.

**Proportion of family members.** An independent samples *t*-test was conducted to evaluate whether the proportion of family (kin) members in social networks differed by gender. The test was not significant, *t*(60) =1.46, *p* = .15. The average proportion for females (M = .51, SD. = .27) was not significantly higher than for males (M =.40, SD. = .32). The 95% confidence interval for the difference in means was narrow averaging from - .04 to .26.
**Average closeness.** An independent samples *t*-test was conducted to evaluate whether closeness of the participants with members of the social network differed by gender. The test was significant, \( t(57) = 2.36, p = .02 \). The average closeness for females, \( (M = 3.95, SD = .41) \) was higher than for males \( (M = 3.7, SD = .56) \). The 95% confidence interval for the difference in means was narrow ranging from .05 to .56.

Thus, the results of significance tests confirm that females tend to contact their network members more often than males and they are closer to their network members compared to males. With regards to the other three network characteristics, they are similar for males and females.

**Analysis of characteristics of social networks by age.**

Table 10 presents the means and standard deviations for density, average frequency of contact, and average number of years participants were known to their network members, proportion of participants’ family members in the network and average closeness of participants with their network members by age. As can be seen from this table, the average values of most network characteristics are similar for the three groups. The only exception is the average number of years the participants know their network members. Specifically, older participants tend to know their network members longer. To further investigate, whether the network characteristics differ by age, one-way ANOVA analyses were performed.

**Table 10**

*Network Characteristics by Age*

<table>
<thead>
<tr>
<th></th>
<th>16-24 years ((N = 21))</th>
<th>25-34 years ((N = 22))</th>
<th>35-49 years ((N = 19))</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>.70</td>
<td>.78</td>
<td>.79</td>
<td>.75</td>
</tr>
<tr>
<td></td>
<td>.21</td>
<td>.23</td>
<td>.22</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td>16-24 years</td>
<td>25-34 years</td>
<td>35-49 years</td>
<td>Total</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>( (N = 21) )</td>
<td>( (N = 22) )</td>
<td>( (N = 19) )</td>
<td></td>
</tr>
<tr>
<td>( M )</td>
<td>3.78</td>
<td>4.01</td>
<td>3.79</td>
<td>3.86</td>
</tr>
<tr>
<td>( SD )</td>
<td>0.49</td>
<td>0.55</td>
<td>0.59</td>
<td>0.55</td>
</tr>
<tr>
<td>( M )</td>
<td>11.94</td>
<td>13.13</td>
<td>19.03</td>
<td>14.53</td>
</tr>
<tr>
<td>( SD )</td>
<td>4.72</td>
<td>7.59</td>
<td>11.52</td>
<td>8.69</td>
</tr>
<tr>
<td>( M )</td>
<td>0.43</td>
<td>0.46</td>
<td>0.47</td>
<td>0.46</td>
</tr>
<tr>
<td>( SD )</td>
<td>0.24</td>
<td>0.33</td>
<td>0.33</td>
<td>0.30</td>
</tr>
<tr>
<td>( M )</td>
<td>3.91</td>
<td>3.90</td>
<td>3.63</td>
<td>3.82</td>
</tr>
<tr>
<td>( SD )</td>
<td>0.41</td>
<td>0.60</td>
<td>0.49</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Note. Frequency of contact was rated on a 5-point scale (1 = Never, 2 = Occasionally, 3 = Monthly, 4 = Weekly, and 5 = Daily). Closeness was rated on a 5-point scale (1 = Very Distant, 2 = Distant, 3 = Somewhat Close, 4 = Close, 5 = Very Close).

\( ^a \)Three participants did not provide network density, contact, or closeness information.

**Density.** As can be seen in Table 11 the distribution of network density is similar in the three age groups. About 19.0% of the youngest group and 26.3% for each of the remaining two groups had the highest possible value for the proportion of network connections (all their network members know each other).
Table 11

Density of Network (10-Member Networks\(^a\)) by Age

<table>
<thead>
<tr>
<th>Proportion of connections (out of a possible 45)</th>
<th>16-24 years ((N = 21))</th>
<th>25-34 years ((N = 19))</th>
<th>35-49 years ((N = 19))</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N)</td>
<td>%</td>
<td>(N)</td>
<td>%</td>
<td>(N)</td>
</tr>
<tr>
<td>0.0</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>0.1</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>0.2</td>
<td>0</td>
<td>0.0%</td>
<td>1</td>
<td>5.3%</td>
</tr>
<tr>
<td>0.3</td>
<td>0</td>
<td>0.0%</td>
<td>1</td>
<td>5.3%</td>
</tr>
<tr>
<td>0.4</td>
<td>3</td>
<td>14.3%</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>0.5</td>
<td>1</td>
<td>4.8%</td>
<td>1</td>
<td>5.3%</td>
</tr>
<tr>
<td>0.6</td>
<td>8</td>
<td>38.1%</td>
<td>1</td>
<td>5.3%</td>
</tr>
<tr>
<td>0.7</td>
<td>0</td>
<td>0.0%</td>
<td>3</td>
<td>15.8%</td>
</tr>
<tr>
<td>0.8</td>
<td>3</td>
<td>14.3%</td>
<td>2</td>
<td>10.5%</td>
</tr>
<tr>
<td>0.9</td>
<td>2</td>
<td>9.5%</td>
<td>5</td>
<td>26.3%</td>
</tr>
<tr>
<td>1.0</td>
<td>4</td>
<td>19.0%</td>
<td>5</td>
<td>26.3%</td>
</tr>
</tbody>
</table>

Note. \(^a\)One participant named only 7 network members; a second named only 8; the rest named 10 members. \(^b\)Three participants did not provide network density information.

A one-way analysis of variance was conducted to evaluate whether density of social networks differed by age. The independent variable included three age groups: 16-24, 25-34, and 35-49 year-old age groups. The dependent variable was the ratio of members connected in social networks. The ANOVA was not significant, \(F(2, 56) = 1.12, \ p = .34\), with the age factor accounting for .04% of the variance of the dependent variable.

**Frequency of contact.** A one-way analysis of variance was conducted to evaluate whether the frequency of contacts differed by age. The independent variable included three age
groups: -16-24 year-old, -25-34 year-old, and -35-49 year-old. The dependent variable was the frequency of contacts. The test was not significant, $F(2, 56) = .33, p = .11$. The effect of age on frequency of contacts as assessed by $\eta^2$ was not strong. The age accounted for .04% of the variance of the dependent variable.

**Average number of years known.** A one-way analysis of variance was conducted to evaluate whether the number of years known differed by age. The ANOVA was significant, $F(2, 59) = 4.15, p = .02$. The relationship between age and the number of years known was moderate, with the age factor accounting for 12% of the variance of the dependent variable. Follow-up tests were conducted to evaluate pair wise differences among the age groups. There was a significant difference in the means between 16-24 years old and 35-49 years old participants, specifically younger participants on average knew their contacts for shorter periods of time than older participants.

**Average proportion of family members by age.** A one-way analysis of variance was conducted to evaluate whether the proportion of family (kin) members in the social networks differed by age. The independent variable included three age groups: 16-24, 25-34, and 35-49 year-old age groups. The dependent variable was the proportion of family (kin) members in social networks. The ANOVA was not significant, $F(2, 59) = .09, p = .92$. The strength of relationship between age and proportion of family (kin) members in social networks was not strong as assessed by $\eta^2$, with the age factor accounting for .03% of the variance of the dependent variable.

**Average closeness.** A one-way analysis of variance was conducted to evaluate whether the closeness of participants with network members differed by age. The independent variable included three age groups: 16-24, 25-34, and 35-49 year-old age groups. The dependent variable
was the ranking of participants of social network members. The ANOVA was not significant, $F(2, 56) = 2.0, p = .14$. Closeness of participants to members of their social networks was not related to age as assessed by $\eta^2$, with the age factor accounting for .07% of the variance of the dependent variable.

**Do Types of Social Support From the Networks Vary by Age and Gender?**

**Types of social support.**

Social support from the network members can be classified into three types: emotional, informational and material support. It is important to look for these three types of social support for the population of individuals deciding to get HIV testing. Berkman and Glass (2000) suggested that the structure of social network can influence the development of social network support processes. Therefore, the total amount of each type of social support, as well as the amount of social support from kin and non-kin network members is investigated.

**Analysis of social network support by gender.**

The descriptive statistics and the results of the independent-samples $t$-tests for each type of social support from kin and non-kin members are presented for male and female participants in Table 12. As can be seen in this table, the amount of emotional and material family support significantly differed by gender, $t(58) = 2.21, p = .03$ and $t(58) = 2.47, = p = .02$, respectively. The average emotional family support for females, $(M. = 4.19, SD. = 1.22)$ was higher than for males $(M. = 3.26, SD. = 1.97)$. The 95% confidence interval for the difference in means ranged from .09 to 1.77. The average material family support for females, $(M = 3.88, SD = (1.18))$ was higher than for males $(M = 2.92, SD. = 1.82)$. The confidence interval or the difference in means
was narrow, ranging from .18 to 1.75. The amount of other types of support was similar for males and females.

### Table 12

*Network Support by Gender*

<table>
<thead>
<tr>
<th></th>
<th>Female ($N = 33$)</th>
<th>Male ($N = 29$)</th>
<th>Total</th>
<th>T(d)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
</tr>
<tr>
<td>Average emotional support</td>
<td>4.22</td>
<td>0.91</td>
<td>4.23</td>
<td>0.62</td>
<td>4.29</td>
</tr>
<tr>
<td>Average emotional support – kin</td>
<td>4.19</td>
<td>1.22</td>
<td>3.26</td>
<td>1.99</td>
<td>3.76</td>
</tr>
<tr>
<td>Average emotional support – non-kin</td>
<td>4.31</td>
<td>0.73</td>
<td>4.04</td>
<td>1.04</td>
<td>4.19</td>
</tr>
<tr>
<td>Average informational support</td>
<td>3.96</td>
<td>1.07</td>
<td>4.12</td>
<td>0.62</td>
<td>4.10</td>
</tr>
<tr>
<td>Average informational support – kin</td>
<td>3.83</td>
<td>1.31</td>
<td>3.18</td>
<td>1.95</td>
<td>3.52</td>
</tr>
<tr>
<td>Average informational support – non-kin</td>
<td>4.13</td>
<td>0.93</td>
<td>3.91</td>
<td>1.04</td>
<td>4.03</td>
</tr>
</tbody>
</table>
### Analysis of social network support by age.

A series of one-way analysis of variance (ANOVA) was performed to evaluate whether emotional, informational and material/service social support differed by age. The independent variable included three age groups: 16-24 year-old group, 25-34 year-old group, and 35-49 year-old group. The dependent variables were the amount of emotional, informational, and material support. The results of these tests together with the descriptive statistics for the different types of social support in each age group are summarized in Table 13. As can be seen in this table, there was no significant difference in the amount of any type of social support by age.

<table>
<thead>
<tr>
<th></th>
<th>Female (N = 33)</th>
<th>Male (N = 29)</th>
<th>Total</th>
<th>T(d)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Average material/service support</td>
<td>3.88</td>
<td>0.66</td>
<td>3.81</td>
<td>0.66</td>
<td>3.85</td>
</tr>
<tr>
<td>Average material/service support – kin</td>
<td>3.88</td>
<td>1.18</td>
<td>2.92</td>
<td>1.82</td>
<td>3.43</td>
</tr>
<tr>
<td>Average material/service support – non-kin</td>
<td>3.74</td>
<td>1.03</td>
<td>3.68</td>
<td>1.04</td>
<td>3.71</td>
</tr>
</tbody>
</table>

**Note.** Emotional and Material/Service support were on a 5-point scale (1 = Hardly Ever, 2 = Rarely, 3 = Sometimes, 4 = Often, and 5 = All the time); they were computed by assigning each network member their highest frequency across all relevant items, then averaging across network members (if a participant had no network members who were kin, support from kin was assigned a value of 0; the same was done for non-kin).
### Table 13

*Network Support by Age*

<table>
<thead>
<tr>
<th></th>
<th>16-24 years (N = 21)</th>
<th>25-34 years (N = 22)</th>
<th>35-49 years (N = 19)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M</strong></td>
<td><strong>SD</strong></td>
<td><strong>M</strong></td>
<td><strong>SD</strong></td>
</tr>
<tr>
<td>Average emotional support</td>
<td>4.40 0.64</td>
<td>4.20 0.55</td>
<td>4.28 0.51</td>
</tr>
<tr>
<td>Average emotional support – kin</td>
<td>4.10 1.49</td>
<td>3.51 1.82</td>
<td>3.65 1.74</td>
</tr>
<tr>
<td>Average emotional support – non-kin</td>
<td>4.33 0.67</td>
<td>4.22 0.73</td>
<td>3.97 1.23</td>
</tr>
<tr>
<td>Average informational support</td>
<td>4.23 0.70</td>
<td>3.92 0.89</td>
<td>4.13 0.48</td>
</tr>
<tr>
<td>Average informational support – kin</td>
<td>3.87 1.46</td>
<td>3.23 1.84</td>
<td>3.47 1.67</td>
</tr>
<tr>
<td>Average informational support – non-kin</td>
<td>4.24 0.80</td>
<td>3.94 1.01</td>
<td>3.89 1.15</td>
</tr>
</tbody>
</table>
### Table 1

<table>
<thead>
<tr>
<th>Age Group</th>
<th>16-24 years (N = 21)</th>
<th>25-34 years (N = 22)</th>
<th>35-49 years (N = 19)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Average material/service support</td>
<td>3.84</td>
<td>0.71</td>
<td>3.74</td>
</tr>
<tr>
<td>Average material/service support – kin</td>
<td>3.73</td>
<td>1.43</td>
<td>3.24</td>
</tr>
<tr>
<td>Average material/service support – non-kin</td>
<td>3.66</td>
<td>0.87</td>
<td>3.78</td>
</tr>
</tbody>
</table>

*Note.* Emotional and Material/Service support were on a 5-point scale (1 = Hardly Ever, 2 = Rarely, 3 = Sometimes, 4 = Often, and 5 = All the time); they were computed by assigning each network member their highest frequency across all relevant items, then averaging across network members (if a participant had no network members who were kin, support from kin was assigned a value of 0; the same was done for non-kin).

---

### Does the Influence of Social Networks on Decisions to be HIV Tested Relate to Gender and Age?

The participants of this study were asked to what extend each of their network members influenced their decision to get HIV testing. This influence was rated on a five-point Likert scale (1 = Very weak, 2 = Weak, 3 = Strong, 4 = Fairly strong, and 5 = Very strong). Then, the average scores indicating the influence of the immediate and extended family members, friends, and acquaintances were computed for each participant. These scores were used in further analyses.
Analysis of social networks influence by gender.

A series of independent samples *t*-tests were conducted to evaluate whether the influence of types of social network ties on the participants’ decisions for HIV testing differed by gender. The results of these tests together with the descriptive statistics for the scores indicating the influence on HIV testing of the different types of network members are summarized for male and female participants in Table 14. As can be seen in this table, there was no significant gender difference for any type of social network influence. This result indicates that different types of network members are equally likely to influence the decision to be HIV tested for males and females.

Table 14

**Influence on Decision to be Tested by Gender**

<table>
<thead>
<tr>
<th></th>
<th>Female (N = 33)</th>
<th>Male (N = 29)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>M</em></td>
<td><em>SD</em></td>
</tr>
<tr>
<td>Influence on HIV testing – Immediate family</td>
<td>2.89</td>
<td>2.06</td>
</tr>
<tr>
<td>Influence on HIV testing – Extended family</td>
<td>2.36</td>
<td>1.68</td>
</tr>
<tr>
<td>Influence on HIV testing – Friends</td>
<td>3.39</td>
<td>1.77</td>
</tr>
</tbody>
</table>
Analysis of social networks influence by age.

A series of one way ANOVA tests were conducted to evaluate whether the influence of immediate family, extended family, friends and acquaintances on the participants’ decisions to get HIV testing differed by age. The results of the tests together with the descriptive statistics are summarized in Table 15. As can be seen in this table, none of these tests were significant. There was no relationship between the influences of the types of social network ties on HIV testing and age.

Table 15

Influence on Decision to Be Tested by Age

<table>
<thead>
<tr>
<th></th>
<th>16-24 years (N = 21)</th>
<th>25-34 years (N = 22)</th>
<th>35-49 years (N = 19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influence on HIV testing – Immediate family</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Female (N = 33)</td>
<td>2.72</td>
<td>1.74</td>
<td>2.33</td>
</tr>
<tr>
<td>Male (N = 29)</td>
<td>2.93</td>
<td>1.82</td>
<td>2.50</td>
</tr>
</tbody>
</table>

Note. Influence was rated on a 5-point scale (1 = Very weak, 2 = Weak, 3 = Strong, 4 = Fairly strong, and 5 = Very strong).
Influence on HIV testing –
Extended family | 16-24 years \((N = 21)\) | 25-34 years \((N = 22)\) | 35-49 years \((N = 19)\) | 
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(M)</td>
<td>(SD)</td>
<td>(M)</td>
<td>(SD)</td>
<td>(M)</td>
<td>(SD)</td>
<td>(F)</td>
<td>(P)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence on HIV testing – Extended family</td>
<td>2.44</td>
<td>1.69</td>
<td>2.17</td>
<td>1.76</td>
<td>2.14</td>
<td>1.35</td>
<td>.18</td>
<td>.84</td>
<td></td>
</tr>
<tr>
<td>Influence on HIV testing – Friends</td>
<td>4.06</td>
<td>1.16</td>
<td>3.67</td>
<td>1.82</td>
<td>3.00</td>
<td>1.84</td>
<td>1.69</td>
<td>.20</td>
<td></td>
</tr>
<tr>
<td>Influence on HIV testing – Acquaintances</td>
<td>2.39</td>
<td>1.34</td>
<td>3.39</td>
<td>1.94</td>
<td>2.36</td>
<td>1.78</td>
<td>2.05</td>
<td>.14</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Influence was rated on a 5-point scale (1 = Very weak, 2 = Weak, 3 = Strong, 4 = Fairly strong, and 5 = Very strong).

**What type of network ties influenced the decisions to be HIV tested?**

To address this research question, a one-way repeated-measures ANOVA, with the scores for the amount of influence from immediate and extended family members, friends and acquaintances was conducted.

**How do the participants who were influenced by members of their network differ from those who were not influenced?**

Based on their responses about the influence of the social network ties on the decision to get HIV tests, the participants of this study were classified into two groups: those who were
influenced by at least one network tie and those who were not influenced by any ties in their network. Of the 62 participants in this study, 17 (27%) were not influenced by any network ties and 45 (73%) were influenced by at least one network tie.

The results of the $t$-tests comparing the support characteristics of the participants that were and were not influenced by network ties to be tested for HIV are provided in Table 16. Neither the age of the network members nor the number of years known to network members differed between those who had an influence and those who did not. All the questions about support except "borrowed or lent money to" showed statistically significant results, with the forms of support being more frequent from those network members who had an influence. Closeness and frequency of contact were also rated significantly higher for the network members who had an influence. Network density and the indices of the three types of support were also significantly higher for those who were influenced than those who were not.

Table 16

* Differences in Characteristics Between Those Who Were Influenced and Those Who Were Not Influenced

<table>
<thead>
<tr>
<th>Personal network</th>
<th>Not influenced $M(SD)$</th>
<th>Influenced $M(SD)$</th>
<th>$t(df)$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>33.23 (12.91)</td>
<td>35.17 (12.18)</td>
<td>-1.32 (445.00)</td>
<td>.19</td>
</tr>
<tr>
<td>Years known</td>
<td>13.53 (11.43)</td>
<td>11.91 (11.56)</td>
<td>1.23 (445.00)</td>
<td>.22</td>
</tr>
<tr>
<td>Meal</td>
<td>3.09 (1.33)</td>
<td>3.56 (1.21)</td>
<td>-3.12 (445.00)</td>
<td>.00</td>
</tr>
<tr>
<td>Visit</td>
<td>3.20 (1.31)</td>
<td>3.67 (1.20)</td>
<td>-3.17 (445.00)</td>
<td>.00</td>
</tr>
<tr>
<td>Money</td>
<td>2.19 (1.40)</td>
<td>2.48 (1.46)</td>
<td>-1.79 (445.00)</td>
<td>.07</td>
</tr>
<tr>
<td>Discuss</td>
<td>2.69 (1.50)</td>
<td>3.58 (1.48)</td>
<td>-5.19 (445.00)</td>
<td>.00</td>
</tr>
<tr>
<td>Comforting</td>
<td>3.20 (1.48)</td>
<td>3.94 (1.21)</td>
<td>-4.48 (180.50)*</td>
<td>.00</td>
</tr>
<tr>
<td>Personal network</td>
<td>Not influenced M(SD)</td>
<td>Influenced M(SD)</td>
<td>t(df)</td>
<td>p</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------------</td>
<td>------------------</td>
<td>---------------</td>
<td>------</td>
</tr>
<tr>
<td>Listening</td>
<td>3.26 (1.45)</td>
<td>3.84 (1.28)</td>
<td>-3.57 (168.48)*</td>
<td>.00</td>
</tr>
<tr>
<td>Encouragement</td>
<td>3.28 (1.44)</td>
<td>3.85 (1.26)</td>
<td>-3.58 (168.40)*</td>
<td>.00</td>
</tr>
<tr>
<td>Support</td>
<td>3.24 (1.50)</td>
<td>3.92 (1.26)</td>
<td>-4.05 (175.51)*</td>
<td>.00</td>
</tr>
<tr>
<td>Figuring out help</td>
<td>2.94 (1.52)</td>
<td>3.91 (1.25)</td>
<td>-5.74 (179.36)*</td>
<td>.00</td>
</tr>
<tr>
<td>Similarity of situation</td>
<td>2.57 (1.56)</td>
<td>3.38 (1.47)</td>
<td>-4.54 (445.00)</td>
<td>.00</td>
</tr>
<tr>
<td>Mind off from situation</td>
<td>3.04 (1.57)</td>
<td>3.71 (1.41)</td>
<td>-3.75 (445.00)</td>
<td>.00</td>
</tr>
<tr>
<td>Introducing help</td>
<td>2.76 (1.48)</td>
<td>3.53 (1.41)</td>
<td>-4.57 (445.00)</td>
<td>.00</td>
</tr>
<tr>
<td>Affection</td>
<td>3.34 (1.48)</td>
<td>3.81 (1.32)</td>
<td>-2.80 (167.09)*</td>
<td>.01</td>
</tr>
<tr>
<td>Providing transport</td>
<td>2.97 (1.62)</td>
<td>3.70 (1.37)</td>
<td>-4.06 (174.21)*</td>
<td>.00</td>
</tr>
<tr>
<td>Closeness</td>
<td>3.52 (1.40)</td>
<td>4.17 (1.11)</td>
<td>-4.15 (183.25)*</td>
<td>.00</td>
</tr>
<tr>
<td>Contact</td>
<td>3.66 (1.44)</td>
<td>4.25 (1.08)</td>
<td>-3.70 (194.52)*</td>
<td>.00</td>
</tr>
<tr>
<td>Emotional support</td>
<td>4.29 (.96)</td>
<td>4.53 (.66)</td>
<td>-2.30 (216.17)*</td>
<td>.02</td>
</tr>
<tr>
<td>Mat/Service support</td>
<td>3.81 (1.22)</td>
<td>4.18 (1.05)</td>
<td>-2.72 (172.00)*</td>
<td>.01</td>
</tr>
<tr>
<td>Informational support</td>
<td>4.00 (1.23)</td>
<td>4.48 (.77)</td>
<td>-3.61 (242.69)*</td>
<td>.00</td>
</tr>
</tbody>
</table>

*Note. *Based on equal variance not assumed.

A series of chi-square tests of independence were conducted to investigate whether participants who were and were not influenced by network ties to get HIV tested were different in categorical characteristics. Male participants and female participants were not more or less
likely to be influenced by someone in their network. There were also not any significant differences by the participants' region, age, education, or occupation. The place of first testing, however, was important: All of the 16 participants who were first tested outside Canada were influenced by their network members; only 29 of the 46 (63%) whose first test was in Canada were. This difference is statistically significant, \( \chi^2 (1) = 8.15, p < .01 \). In addition, a significantly higher proportion of friends and acquaintances had more influence than family members (26.8% vs. 13.7%, \( \chi^2 (1) = 10.9, p < .01 \)).

**Summary of the Quantitative Results**

The analyses in this section aimed to address the research question in the study using the quantitative data collected from the survey administered to the study participants. Descriptive and inferential analyses used in this section allowed exploring the characteristics of the study participants and their social networks. In addition, the relationship of the network characteristics to the gender and age of participants was explored.

In exploring the influence of social networks in HIV testing, quantitative data provided useful background information about the participants’ demographics – age, country of birth, sex, education, employment status, and income. In addition to this, quantitative data indicated when participants were first tested for HIV and whether they were also tested when they came to Canada or not.

The sample used in this data has equal gender representation, with the participants coming mostly from the Caribbean, Eastern, and Southern Africa. Most of the participants have College or University degree, work part-time or are students, have low income and were tested for HIV after 1995.
The social network for most of the participants consists of few immediate and extended family members and friends. Very few participants mentioned acquaintances in their networks. About 25% of male participants had networks completely consisting of friends only.

A typical (average) network for a participant of this study would consist of people that tend to know each other (density = .78). The participants would contact their network ties on average weekly and know them for 14.5 years, and would characterize their relationship as “close.” Female participants tend to get higher levels of emotional and material support from their kin network ties comparing to the male participants. However, the amount of other types of support from different network ties are similar for male and female participants and do not depend on their age.

Males and females as well as persons of different age are equally likely to be influenced by network ties to be HIV tested. However, persons that are influenced by any network ties to get HIV tested have higher levels of various types of support from their networks.

Statistical tests were conducted to determine the influence of the structural variables of social networks in HIV testing. Most importantly, the tests revealed that all four types of social network ties influenced individuals’ decisions to get HIV testing. The greatest influence on HIV testing was from friends. The least influence on HIV testing came from extended family members.

**Qualitative Findings**

The qualitative part of the research was to gather qualitative data about the different responses of help-seekers to the various types of social network ties which the quantitative data could not really provide. Data collection for the qualitative research technique was also focused
on investigating how immediate and extended family social network ties, friends and acquaintances influenced individual participants to get HIV testing. Face-to-face interviews involving semi-structured questioning were conducted to delineate the influence of the four types of social network ties in HIV testing.

By further applying qualitative data to the study I hoped to extend understanding of HIV/AIDS sensitive issues, socially embedded network ties. Through qualitative inquiry, it is possible to obtain information about stigma, discrimination, the fear and conflicts that exist within personal networks. The researcher heard for himself the participants saying that they never could have recovered from HIV illness if they had not got HIV testing and be able to go on to treatment. The qualitative data analyses provided important information about how and why participants decided to be tested.

Table 17 provides a summary of the themes that emerged from the analysis. A total of five themes emerged from the data. The themes were listed in Table 17 and they appear with the example of statements from which they were drawn.
<table>
<thead>
<tr>
<th>Theme</th>
<th>Example Quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What influenced who is in the participant’s social network?</td>
<td>Participant was rejected by family members because of sexual orientation, gender identity, or sex work</td>
</tr>
<tr>
<td></td>
<td>I was thrown out of the family by my parents because I am gay and that I could be thrown in prison any time. (Participant 21)</td>
</tr>
<tr>
<td></td>
<td>My family was ashamed. As a sex worker, they accused me for spreading HIV epidemic. (Participant 13)</td>
</tr>
<tr>
<td>Participant sought support outside family because family was reluctant to discuss testing</td>
<td>My parents didn’t want to talk to us about sex and HIV. All of us were not open to talk about that subject together because it was taboo. This was different with my friends. (Participant 27)</td>
</tr>
<tr>
<td>2. Who influenced the participant’s decision to be tested?</td>
<td>Participant was influenced by immediate family</td>
</tr>
<tr>
<td></td>
<td>We take routine testing for HIV as a family and share information about the test results. Generally, the level of HIV awareness and testing in my country is high. (Participant 29)</td>
</tr>
<tr>
<td></td>
<td>My mother and friends knew that I was bisexual. They were concerned that I might have been at high risk for HIV through my sexual contacts with multiple partners. (Participant 38)</td>
</tr>
<tr>
<td></td>
<td>My failing health became the concern for my family and our neighbours. My parents insisted that I get HIV testing. (Participant 55)</td>
</tr>
<tr>
<td>Theme</td>
<td>Example Quotations</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Participant was influenced by friends</td>
<td>Our parents did not have any information but my close friend in the medical profession understood the risks for infection with HIV and we started searching for information from libraries and the Internet about benefits of getting tested. Then my close friends encouraged me to be tested at the clinic where she worked as a nurse. (Participant 2) After talking to my friends for months, I finally gathered courage and accepted to get HIV testing. Because of my unprotected sexual activities, I thought that I might have been exposed to HIV and better to know about my condition before I fell really, really sick if I had the infection. (Participant 12) Many students were getting HIV testing at the university where I was studying. I thought to myself that getting tested was a good idea. So one day I decided to join two of my friends and went for HIV testing. (Participant 52)</td>
</tr>
<tr>
<td>Participant was influenced by acquaintances</td>
<td>The degree course on HIV/AIDS that I took at university influenced me to participate actively in the campaign against HIV and promoting HIV testing among students. I went to get HIV testing with other students to lead by example. (Participant 23) My colleagues at the school where I was a teacher advised me to get HIV testing. I went on sick leave for over 3 months without getting better. I feared that if they found out that I got HIV they would tell the whole school. (Participant 48)</td>
</tr>
<tr>
<td>Theme</td>
<td>Example Quotations</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Participant was influenced by sexual</td>
<td>My partner and I decided to get tested together to be safe and continue with our relationship. (Participant 4)</td>
</tr>
<tr>
<td>partner(s)</td>
<td>I decided to get HIV testing together with my husband immediately after getting married. We wanted to ensure that we did not have HIV before planning to have a baby. Our families encouraged us to get tested. Many young mothers lost their babies immediately after they were born because of HIV. Transmission of HIV from mothers to children can effectively be prevented by nevirapine. (Participant 54)</td>
</tr>
<tr>
<td>Participant was influenced by public</td>
<td>The President’s TV address to the nation about HIV/AIDS influenced me to be tested. (Participant 32)</td>
</tr>
<tr>
<td>figures (e.g., politicians)</td>
<td>When my friends and I listened to the Parliamentarian one day, speaking about HIV testing. She talked about safe sex and HIV testing to make sure that we have early treatment if we have HIV. Her persuasive speeches influenced us to get HIV testing. (Participant 24)</td>
</tr>
</tbody>
</table>

3. Why was that person or were those people influential?

<table>
<thead>
<tr>
<th>The network member had medical knowledge or worked at a clinic</th>
<th>The talk by the doctor to the congregation one Sunday about the benefits of HIV testing encouraged me to get tested. (Participant 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>My workmates and supervisor at the clinic influenced me to get HIV testing. (Participant 30)</td>
</tr>
<tr>
<td></td>
<td>My brother who was working for an AIDS agency influenced me. (Participant 41)</td>
</tr>
<tr>
<td>The network member was HIV-positive</td>
<td>I went to be testing after my husband was diagnosed with HIV in hospital. (Participant 61)</td>
</tr>
</tbody>
</table>
### Theme

| The network members were close friends and were getting tested | I went to get tested in the company of my gay peers who were getting HIV testing. (Participant 4)  
| | A group of fellow transgendered friends who were getting HIV testing influenced me. I went to be tested because I am a sex worker. My family sent me away from home. (Participant 13)  
| | My close friend influenced me to get HIV testing. (Participant 31)  
| | My friends and I influenced each other to get tested when we were at college. We wanted to become responsible people and to take control of our lives. (Participant 46)  
| | While I was a student at university, I decided to join my two friends to get tested for HIV. (Participant 52) |

### 4. How did the participant think their being tested might affect other network members?

| Participant worried that their family or sexual partner might be stigmatized by their community | I kept worrying about HIV testing because my family’s reputation would be ruined in the community if I discovered that I had HIV. (Participant 58)  
| | I was concerned about the stigma and discrimination against people with HIV/AIDS and their families. It is painful. I did not want to talk to my family about my HIV testing. After arguing for about 3 months, I finally decided to get tested. (Participant 12)  
| | I would not disclose my HIV test result to my parents because I would not want to disgrace them. (Participant 43)  
<p>| | When you have HIV you and your whole family are discriminated against by the community. (Participant 2) |</p>
<table>
<thead>
<tr>
<th>Theme</th>
<th>Example Quotations</th>
</tr>
</thead>
</table>
| Participant hoped that his/her being tested might encourage others to be tested | In outreach work with the Africans in Partnership against AIDS (APAA), I disclose my test result to encourage the gay people to get HIV testing. (Participant 15)  
I was thrown out of the family because I am gay. They warned me that I would be imprisoned if I was discovered. I influence other gay people to get HIV testing after I was tested myself. (Participant 21)  
I get HIV testing regularly and influence others of similar sexual orientation as I am to be tested to ensure that they know they do not have infection or start getting HIV treatment early. (Participant 25)  
I disclosed my HIV testing result to encourage others to get HIV testing. Many of my work mates followed my example. (Participant 27) |
<table>
<thead>
<tr>
<th>Theme</th>
<th>Example Quotations</th>
</tr>
</thead>
</table>
| Participant knowing his/her own HIV status would allow them to get treatment and remain independent | I promised that I would take control of my life and not kill myself. I have been on medication since 2008. My two children are still in Swaziland. I hope that they will come to join me soon. (Participant 17)  
While we understand that there is no cure for the virus, we can defeat it if people get HIV testing and stop passing it to others if they know that they have the infection. (Participant 26)  
My half brother and brother-in-law died of HIV related illnesses. Members of my family then knew that HIV was real. I told myself that if I know that I have the virus, I will get treatment and be alive. I then decided to get HIV testing in 1998. (Participant 32)  
I am glad I listened to the advice of my family and close friends. HIV testing is the only best thing to do for anyone at high risk for HIV infection. It is the gateway to treatment. (Participant 36)  
Drug injection exposes me to infection. My friends and I influence each other to get tested so that we can keep ourselves in check. (Participant 38)  
In sex work it is important to be healthy at all times, hence I get HIV testing regularly so that I do not infect others with HIV without knowing. (Participant 42) |
5. What other factors and circumstances influenced the participant’s decision to be tested?

<table>
<thead>
<tr>
<th>Theme</th>
<th>Example Quotations</th>
</tr>
</thead>
</table>
| Precipitating event: Death from AIDS of family member or friend | After my partner had died of HIV infection, my parents were concerned that I might have been exposed to HIV. They strongly advised me to get HIV testing immediately. (Participant 3)  
After my former husband had died there was something that was now happening to my health. I went to get HIV testing because of the symptoms that I was noticing. (Participant 17)  
After my father’s death, my mother began to worry about ever to experience death in the family again. She asked all of us to get HIV testing. (Participant 34)  
When my first child died shortly after his birth from HIV related illness I could no longer resist getting HIV testing. I gave in and accepted my friends’ advice to get tested to ensure that I did not have the infection. (Participant 50)  
Looking after two orphans in the home, my mother had become familiar with HIV-related deaths. From the symptoms that she saw, she took me for HIV testing right away. Our relatives gossiped saying that I deserved to get HIV when they knew I had the infection. (Participant 51)  
Both my children died immediately after their birth. My parents advised me to get HIV testing. (Participant 62) |
<table>
<thead>
<tr>
<th>Theme</th>
<th>Example Quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitating event: Considering having a child</td>
<td>Many young mothers lost their babies immediately after they were born because of HIV. Transmission of HIV from mothers living with HIV to their children can effectively be prevented. We decided to get tested before hand to ensure that we had no HIV. (Participant 54)</td>
</tr>
<tr>
<td></td>
<td>Thinking of having my fourth child, I decided to get HIV testing. (Participant 14)</td>
</tr>
<tr>
<td></td>
<td>I had plans for remarrying and starting a new family. (Participant 17)</td>
</tr>
<tr>
<td>Precipitating event: Participant’s sexual partner was diagnosed with HIV</td>
<td>My wife had died of AIDS and the doctor advised that I must get HIV testing immediately. (Participant 59)</td>
</tr>
<tr>
<td></td>
<td>I went to get HIV testing after my husband had been diagnosed with HIV. The result of the test showed that I had HIV. (Participant 61)</td>
</tr>
<tr>
<td>Theme</td>
<td>Example Quotations</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Precipitating event: Participant's worsening symptoms and stage of illness | With me already having Hepatitis C, I went for HIV testing to check that I did not have HIV. (Participant 16)  
I would vomit and vomit after eating. Some symptoms were suggesting that I could be having HIV infection so I went to get HIV testing. (Participant 17)  
When the test result for Malaria was negative, the doctor ordered that I have screening for HIV. (Participant 35)  
When my brother who was working for an AIDS agency in Uganda saw me, he observed some symptoms and suspected that I might have HIV. He compelled me to go for HIV testing. (Participant 41)  
From a series of lectures, campaigns and the information I got from reading pamphlets distributed to students, I became concerned about some of the symptoms that I was developing and decided to get HIV testing. (Participant 49)  
The neighbours began to notice some changes in my health and raised the issue with my parents who took up the issue with me and insisted that I get HIV testing. (Participant 55)  
I developed a strange skin disease. I could not concentrate on my university work with this condition. I went for HIV testing after discussing the issue with my parents. (Participant 57)  
For nearly 10 years, I had been treated for a muscular disease without improvement. I had abscesses in my mouth and suffered from sore throat endlessly. After being through all kinds of these conditions, I finally decided to go for HIV testing. (Participant 60) |
<table>
<thead>
<tr>
<th>Theme</th>
<th>Example Quotations</th>
</tr>
</thead>
</table>
| Participant influenced by publicly-available information | Many students were getting HIV testing because of HIV/AIDS awareness programs in universities. So one day I decided, “Why can’t I join those students who are getting HIV testing?” (Participant 52)  
Flyers and posters influenced me to get HIV testing. Their influence on my sexual behaviour was very strong. (Participant 26)  
A series of lectures and pamphlets distributed to students on the university campus about HIV prevention influenced me to get HIV testing at the university clinic. (Participant 49)  
My mother began to talk openly about HIV and brought a lot of HIV/AIDS reading material for me to read about HIV/AIDS. (Participant 51) |
| Participant worried about censure by religious community | Because of Shari’a law, anyone getting HIV testing will be perceived as immoral by the public. (participant 1)  
I was a youth leader in the church where the doctrine about no sex before marriage and abstinence were strong. At home, talking about sex and HIV in the family was taboo. (Participant 35) |
<p>| Participant unable to avoid risky behaviours             | Although safe sex prevents HIV infection, I was not free to use condoms with my husband. The introduction of micobicides for use by women might prevent infection. (Participant 2) |</p>
<table>
<thead>
<tr>
<th>Theme</th>
<th>Example Quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant’s work involved risk of exposure to HIV</td>
<td>Getting tested is one way of making sex work less risky and of promoting it as a decent profession. (Participant 13)</td>
</tr>
<tr>
<td></td>
<td>Being free from HIV infection is important for sex work. I have to be healthy all the time hence the need for HIV testing regularly. (Participant 42)</td>
</tr>
<tr>
<td></td>
<td>My fellow college students and I studying Hotel and Hospitality Management were aware that a career in that field also presented us with challenges to be free from HIV infection. (Participant 24)</td>
</tr>
<tr>
<td></td>
<td>In my case, I was exposed to high risk for HIV infection as a clinical nurse working with patients who were suffering from different types of infectious illnesses. I was tested for HIV at the hospital where I worked as a nurse. (Participant 33)</td>
</tr>
<tr>
<td></td>
<td>I was involved in care work with people living with HIV. I got HIV testing because I was exposed to HIV at work. (Participant 44)</td>
</tr>
<tr>
<td>Participant’s recreational activities required testing</td>
<td>Risky sexual behaviour by soccer players was linked to unfitness and poor performance in the team. All team players went for routine HIV test regularly and this is how I got HIV testing with my soccer captain to ensure that I was physically fit to join the team. (Participant 10)</td>
</tr>
<tr>
<td>Participant’s care of family member involved risk of exposure to HIV</td>
<td>I thought I might have been exposed to HIV through the care that I gave my sick sister at home before she died of HIV-related illness. (Participant 37)</td>
</tr>
</tbody>
</table>

**What influenced who is in the participant’s social network?**

This theme, explored why participants sought advice for HIV testing from certain types of social network ties and why they avoided other types of ties. Seeking HIV testing advice was
examined in terms of the influence of immediate family members, extended family members, friends and acquaintances in HIV testing.

Some participants reported that the basis for their choice was because their immediate family members had rejected them after they had changed their sexual orientation, gender identity or become sex workers. These stigmatized identities led participants to seek help outside their immediate families and kin network ties. The following were examples of reports from such participants.

I was thrown out of the family by my parents because I am gay and that I could be thrown in prison any time if this was publicly known. (Participant 21)

My family ostracized me because they believed that sex work was responsible for spreading the HIV epidemic. (Participant 13)

**Who influenced the participant’s decision to be tested?**

Individuals experiencing symptoms of HIV/AIDS faced many challenges in deciding whether to get HIV testing. Also, support from immediate family members, extended family members, friends and acquaintances were not easily obtained. The relationship between help-seekers and personal network ties was usually a complicated process to manage for both help-seekers and help-givers. Accordingly, the influence of each social network tie in the individual’s decisions to get HIV testing will be examined under this theme.

**Network influence from immediate family members.**

A number of participants made the point that their immediate family members influenced them to get HIV testing. The following statements were examples of participants who were influenced by members of their immediate families to get HIV testing:
We take routine testing for HIV as a family and share information about the test results. Generally, the level of HIV awareness and testing in my country is very high. (Participant 29)

My mother and friends knew that I was bisexual. They were concerned that I might have been at high risk for infection with HIV through sexual contact with multiple partners and asked me to get tested. (Participant 38)

My failing health became the concern of my family and our neighbours. My parents insisted that I get HIV testing. (Participant 55)

**Network influence from extended family members.**

Participants who were influenced by extended family members were those who lived with relatives when their parents had died or separated. As they were brought up by extended family members, the participants became part of the family and the influence by extended family developed as they were growing up. The following expression was an example of such a case:

My aunt and cousins I grew up with were deeply concerned about me contracting HIV because I am gay. They advised me to get tested. (Participant 21)

**Network influence from friends.**

Interaction with close friends exposed a number of participants to HIV/AIDS information including the benefits of getting HIV testing. Information exchange among close friends was often experienced as supportive at the time of deciding to get HIV testing. The influence from friends was expressed by a number of participants described in the following statements:

My close friend in the medical profession understood the exposure to risk for infection with HIV and we started talking about getting tested. She encouraged me to be tested at the clinic where she worked as a nurse. (Participant 2)
After talking to my friends for months, I finally gathered courage and accepted to get HIV testing. Because of my unprotected sexual activities, I thought that I might have been exposed to HIV and better to know about my condition before I fell really, really sick if I had the infection. (Participant 12)

Many students were getting HIV testing at the university where I was studying. I thought to myself that getting tested was a good idea. So one day I decided to join two of my friends and went for HIV testing. (Participant 52)

**Network influence from acquaintances.**

In the category of acquaintances are people from sectors such as AIDS service organizations, the health profession, the church, classmates and schoolmates, professionals and consumers who were knowledgeable about HIV/AIDS. One of the reasons for people turning to acquaintances is when assistance is not available in family and friendship network ties. Some acquaintances influenced others to get HIV testing by providing informational support and the frequency of contact. Below are the statements that were expressed by those participants who were influenced to get HIV testing by their acquaintances.

The degree course on HIV/AIDS that I took at university influenced me to participate actively in the campaign against HIV and promoting HIV testing among students. I went to get HIV testing with other students to lead by example. (Participant 23)

My colleagues at the school where I was a teacher advised me to get HIV testing. I went on sick leave for over 3 months without getting better. (Participant 48)

I was influenced by my mentor, neighbour, friends and teacher to get tested when I was looking really sick. (Participant 45)
What other factors and circumstances influenced the participant’s decision to be tested?

An important contribution of the qualitative inquiry to this study is that more categories of help sources for HIV testing emerged in addition to the immediate and extended family, friends and acquaintances social network ties originally considered in the first part of the study. The categories that were created by qualitative data and not specifically asked about in the questionnaire are important to know fully the influence of social networks in the individuals’ decisions to get HIV testing.

The additional categories of help sources for individuals deciding to get HIV testing that were created from qualitative data were the influence from sexual partners and influence of public figures. The qualitative data also illustrated the importance of other considerations; for example: precipitating events in daily life such as death from AIDS of family member, family planning considerations, worsening symptoms, and stage of illness. Other information that came to the fore through the qualitative data were: publicly-available HIV/AIDS information, worry about censure by religious community, participant’s inability to avoid risky behaviours, work involving risk of exposure, participant’s recreational activities requiring testing, and care of family member involving exposure to infection with HIV were others.

**Influence from sexual partners and from people living with HIV-positive.**

Sexual partners were trying to establish long-term relationships were found to influence each other in the decisions to get HIV testing. Some participants believed that learning about the experiences of others living with HIV helped them to evaluate the benefits of HIV testing.

My partner and I decided to get tested together to be safe and continue with our relationship. (Participant 4)
Influence from someone with HIV/AIDS.

Everyday life with people with HIV/AIDS also influenced other network members to get HIV testing. Knowing a member of the family or long-term survivors of HIV encouraged other network members to get HIV testing. Participants expressed this type of influence in the statements reported:

People who recovered from HIV-related illness after getting treatment encouraged me to get HIV testing. (Participant 51)

I stayed with people living with HIV/AIDS who provided me with important information that I wanted in deciding to get HIV testing. (Participant 4)

Influence from public political figures.

Political leaders can have strong influence in the fight against HIV/AIDS. Their political will had important influence for individuals seeking HIV testing. Below are examples of expressions of influence from public figures:

The President’s TV address to the nation about HIV/AIDS influenced me to be tested. (Participant 32)

When my friends and I listened to the Parliamentarian one day speaking about safe sex and HIV testing to make sure that we have early treatment if we have HIV, she influenced us to get HIV testing. (Participant 24)

Influence from illness and disease symptoms.

HIV-related illness and disease symptoms that resulted in rapid deterioration of physical health were cited as factors that influenced individuals’ decisions to get HIV testing. This was expressed in the statements recorded:
With me already having Hepatitis C, I went for HIV testing to check that I did not have HIV. (Participant 16)

I would vomit and vomit after eating. Some symptoms were suggesting that I could be having HIV infection so I went to get HIV testing. (Participant 17)

For nearly 10 years, I had been treated for a muscular disease without improvement. I had abscesses in my mouth and suffered from sore throat endlessly. After being through all kinds of these conditions, I finally decided to go for HIV testing. (Participant 60)

**Influence from publicly distributed HIV/AIDS awareness messages.**

Information dissemination through publicly-available selected media targeting different groups influenced individuals’ decisions to get HIV testing. The following expressions indicate the experience of participants who were influenced to seek HIV testing from publicly distributed messages for HIV/AIDS awareness:

Many students were getting HIV testing because of HIV/AIDS awareness programs in universities. So one day I decided, “Why can’t I join those students who are getting HIV testing?” (Participant 52)

Flyers and posters influenced me to get HIV testing. Their influence on my sexual behaviour was very strong. (Participant 26)

A series of lectures and pamphlets distributed to students on the university campus about HIV prevention influenced me to get HIV testing at the university clinic. (Participant 49)

My mother began to talk openly about HIV and brought a lot of HIV/AIDS reading material for me to read about HIV/AIDS. (Participant 51)
**Influence from desire to know one’s HIV status.**

Fear resulting from exposure to infection with HIV at work or by caring for someone at home suffering from HIV/AIDS-related illness influenced some people to get HIV testing.

In my case, I was exposed to high risk for HIV infection as a clinical nurse working with patients who were suffering from different types of infectious illnesses. I was tested for HIV at the hospital where I worked as a nurse. (Participant 33)

I was involved in care work with people living with HIV. I got HIV testing because I was exposed to HIV at work. (Participant 44)

**Influence from desire to join certain activities.**

The desire to join certain activities that demanded physical fitness such as soccer or athletics influenced people to get HIV testing: This sentiment was expressed in the following statement:

Risky sexual behaviour by soccer players was linked to unfitness and poor performance in the team. All team players went for routine HIV test regularly and this is how I got HIV testing with my soccer captain to ensure that I was physically fit to join the team. (Participant 10)

**Why was that person or were those people influential?**

This theme documented the reasons why the persons or those network members provided the help that the participants were seeking in order to make decisions to get HIV testing. The fact that the network member had medical knowledge or worked in a health care service was mentioned to be a source of influence for participants to get HIV testing as shown in the statements recorded:
The talk by the doctor to the congregation one Sunday about the benefits of HIV testing encouraged me to get tested. (Participant 5)

My workmates and supervisor at the clinic taught me a lot that influenced me to get HIV testing. (Participant 30)

My brother who was working for an AIDS agency influenced me. (Participant 41)

**How did the participants think their being tested might affect other network members?**

People living with HIV/AIDS, their loved ones, and even their caregivers often get stigmatized by their communities. People with HIV may be rejected by their families, lose their jobs, or be subjected to violent attacks by others (Brimlow, Cook, & Seaton, 2003). The data from interviews revealed that participants were concerned their families would be affected if they were noticed getting HIV testing in public. The stigma and discrimination related to HIV/AIDS were the main reason why participants avoided discussing HIV testing with some members of their social network. The fears expressed by participants are reported as follows:

**Response to HIV testing by the family and the public.**

The stigma and discrimination were some of the reasons why participants did not want to talk to anyone about HIV testing.

I kept worrying about discussing HIV testing because my family’s reputation would be ruined in the community if I were known that I wanted to get HIV testing. (Participant 58)

I was concerned about the stigma and discrimination against people with HIV/AIDS and their families. I did not want to talk to my family about HIV testing. I still feel bad about my own situation. (Participant 12)
I did not want my parents to know that I wanted to get HIV testing because they would feel disgraced and shocked. (Participant 43)

**HIV-related attitudes on religious values.**

Some participants worried about censure by their religious community. They expressed concern about being seen getting HIV testing by others of the same religious beliefs. Shari’a law believed in punishing sex offenders by stoning them to death. Some Christian Churches for example, preached about having no sex before marriage. Under such conditions, being noticed getting HIV testing by the public would be perceived as tacit admission of guilt.

Because of Shari’a law, anyone getting HIV testing will be perceived as immoral by the public. (Participant 1)

I was a youth leader in the church where the doctrine about no sex before marriage and abstinence were strong. At home, talking about sex and HIV in my Christian family was taboo. (Participant 35)

**HIV and marital relations.**

HIV testing was reported to threaten marital relationships between spouses. A female participant expressed her feelings in the following way:

I was not free to use condoms with my husband. I hope that micobicides will become widely accessible for women to protect ourselves from HIV infection by uncooperative sexual partners. (Participant 2)

**Encouragement of HIV testing to others.**

Some participants hoped that his/her being tested might encourage others to be tested. Participants thought talking to individuals experiencing a similar condition could encourage others to get HIV testing.
In outreach work with the Africans in Partnership against AIDS (APAA), I disclose my test result to encourage the gay people to get HIV testing. (Participant 15)

I influence other gay people to get HIV testing because I was tested myself. (Participant 21)

I get HIV testing regularly and influence others of similar sexual orientation as I am to be tested to ensure that they know they do not have infection or start getting HIV treatment early. (Participant 25)

I disclosed my HIV testing result to encourage others to get HIV testing. Many of my work mates followed my example. (Participant 27)

**Improvements in HIV treatment.**

Long-term survivors of HIV-related illness encouraged others to get treatment and remain independent. Participants expressed their feelings about results of HIV testing as follows:

I promised that I would take control of my life and not kill myself. I have been on medication since 2008. My two children are still in Swaziland. I hope that they will come to join me soon. (Participant 17)

While we understand that there is no cure for the virus, we can defeat it if people get HIV testing and stop passing it to others if they know that they have the infection. (Participant 26)

I told myself that if I know that I have the virus, I will get treatment and be alive. I then decided to get HIV testing in 1998. (Participant 32)

I am glad I listened to the advice of my family and close friends. HIV testing is the only best thing to do for anyone at high risk for HIV infection. It is the gateway to treatment. (Participant 36)
After appraising the influence of immediate family members, extended family members, friends and acquaintances in individuals seeking HIV testing, patterns of other sources of influence emerged from qualitative data. Precipitating events such as death of someone close from HIV-related illness increased the participant’s exposure to information about HIV and the desire to seek HIV testing. The following are statements of precipitating events that were expressed under this theme:

After my partner had died of HIV infection, my parents were concerned that I might have been exposed to HIV. They strongly advised me to get HIV testing immediately. (Participant 3)

Looking after two orphans in the home, my mother had become familiar with HIV-related deaths. From the symptoms that she saw, she took me for HIV testing right away. Our relatives gossip saying that I deserved to get HIV when they knew I had the infection. (Participant 51)

I went to get HIV testing after my husband had been diagnosed with HIV. The result of the test showed that I had HIV. (Participant 61)

Summary of the Qualitative Results

In addition to immediate and extended family members, the importance of friends and acquaintances emerged from the qualitative data. Findings from the qualitative inquiry indicated that male and female reasons for deciding HIV testing differed. Some domestic conflicts arose from HIV testing. Some female participants reported getting HIV testing because they feared that they were at risk for infection with HIV from unfaithful husbands. Diagnosis of HIV threatened some marriages with divorce.
Some participants got HIV testing for family planning reasons. Sex workers were compelled to get HIV testing because sex work made them vulnerable to infection with HIV and the trade required them to remain free from infection with HIV. Many women felt powerless because they could not use condoms freely within a marriage. Participants who were powerless to protect themselves from infection within marriages looked for support from network members outside of their immediate family members.

Immediate family members were a source of influence when they were open and willing to discuss HIV testing. However, the data revealed other sources of support that influenced them to get HIV testing. Death of a family member or exposure to risk for HIV infection from work or caring for a member of family suffering from HIV-related illness were reported as pressure for some individuals to seek HIV testing.

Stigma and discrimination for people living with HIV created fears in some participants to get HIV testing. Being seen getting HIV testing would be viewed as admission of a sexual offence by some church organizations. Thus, getting HIV testing for some individuals required special effort in some communities. Some differences do exist in social network ties that influence individuals to get HIV testing. These factors are challenges that need further investigation in future research.

Mixed Method Design Conclusion

A mixed method approach was applied in order to comprehend the influence of social networks in the individuals’ decisions to get HIV testing more fully. The main objective of the study was to determine the influence of immediate family members, extended family members,
friends and acquaintances/peers in deciding to get HIV testing but additional factors were later found.

The quantitative research generated descriptive categories that reflected the wide distribution of the study sample. The details of the 62 participants’ demographic information delineated in statistics tables included age, country of origin, ethnicity, sex, gender identity, education, employment, income and why and when the participant decided to get HIV testing.

Quantitative data also showed a diversity of characteristics of participants came from across the following five regions: the Caribbean, Eastern Africa, Northern Africa, Southern Africa and Western Africa. Most of the participants originated from Eastern Africa. Western Africa was represented by the least number of participants.

Network ties and social network structures were identified. These were for determining social network support and influence in the individual’s decision to get HIV testing. Descriptive statistics were conducted to examine how social network ties contributed to influence individuals’ decisions to get HIV testing.

To answer the research question, the findings from the quantitative data alone were able to explain the primary focus of the study that social networks influenced individuals’ decision to get HIV testing. The data informed the research that the influence of immediate family members, extended family members, friends and acquaintances operated in combination to influence help-seekers to get HIV testing.

The issues of stigma, fear and discrimination against people with AIDS were captured by the qualitative inquiry. These issues that emerged from qualitative data were critical for understanding factors that mediated the individuals’ decisions to get HIV testing within person
social networks. In addition, other factors like the publicly available messages from the media and public politicians also were found to have influence on individuals’ decisions to get HIV testing.

A number of precipitating events that people experience in everyday life also influence individuals to get HIV testing. Events such as death of a loved one or well known person, symptoms of an illness or knowing a long-time survivor from HIV were some of the other factors that emerged from qualitative data. This mixed method approach was used in the current study to add more strength and credibility to the findings than if either quantitative or qualitative research alone was used.
CHAPTER 6:
DISCUSSION OF FINDINGS

Introduction

In this chapter, a review of the analysis of the findings of the role played by type of social network ties in HIV testing will be presented. The discussion will be centered on the research question: Which type of social network relationship tie most influences the decision to test for HIV? The chapter will discuss the evidence relating to the influence of the four types of social network ties – immediate family, extended family, friends, and acquaintances – on the decision to test for HIV. The implications of the study for public health will be presented. The limitations of the present study and recommendations for future research will be outlined. In the conclusion, key insights of social network-driven interventions in HIV testing, treatment, and care will be provided.

Overview of Findings

The research findings reported here showed that social interactions between network members, experiences of daily life with network members and the purposive search for information from a variety of resources influenced decisions to test for HIV. Friends were perceived to have the greatest influence on the decisions to test for HIV among the 16 to 34 year old participants followed in order of importance by immediate family, acquaintances and extended family members, respectively. This finding is inconsistent with Granovetter’s “Strength of Weak Ties” theory (1983). The theory emphasized that weak ties provided more information flow of new ideas to network members than one’s own strong ties, though the context in this study differs from that upon which Granovetter’s research was based. On the contrary, Weimann
(1983) argued that weak ties provide the bridges for the diffusion of innovations across boundaries of social groups but decision making is influenced mainly by strong ties in each group. Grannerman (2006) concurred with Weismann by adding that social ties function as strong ties.

Close friends empathized easily with each other’s health problems, and they trusted each other with private information about HIV because of their similar social experiences. Friends were easily accessible to network members because they experienced a common culture. The influence of friends on network members was woven into the activities of their everyday life. Information among friends was both given and received during social interaction. Information acquisition and sharing incorporated both active and explicit exchanges:

We argued for about 3 months about testing. Then, I finally gathered courage and decided to get tested. (Participant, 12)

Some participant lived with friends who were long-term HIV survivors. In such cases, information was shared between friends in a social setting. Some friends worked collaboratively in legitimating or validating HIV/AIDS information from many sources. Validation of information was important because HIV/AIDS is often explained in a technical language that lay people cannot understand easily. Friends used enterprising means to obtain information from a wide range of modern social media sources such as Facebook, and the sharing of this information helped them to take charge of their own lives in the face of the HIV/AIDS epidemic confronting them. Friends searched information from libraries and the Internet:

Our parents had no information. They avoided discussing HIV/AIDS with us. There was need for the young people to do something. To fill the gap, my close friends and I started searching for information from the libraries and the Internet about HIV and the benefits of HIV testing. (Participant 2)
Friends facilitated discussion of sensitive topics such as HIV, sex and reproductive health. They were open to different views and not judgmental. Many of the participants in this study immigrated from societies where infection with HIV was perceived as punishment for sin. In that context, the support of trusted friends played a very important part in the participants’ decisions to test for HIV. Friends were a vital source of quality information on which participants built a strong base of knowledge for deciding to test for HIV. This finding is consistent with a broader research literature indicating that friendship network members with HIV infection have been mobilized to recruit other members (CDC, 2006; Heckathorn et al., 1999).

Next to friends, immediate family members, linked by blood relationships and enduring ties, were of importance to the decision to seek HIV testing. Compared to extended families, immediate families were smaller and more densely connected. The data indicate that immediate families can influence members who are estranged from the family to test for HIV.

It is usual for immediate family members to live in the same household, share food together, enjoy close relationships, and interact with each other frequently. The intensity of emotion for each other and the degree of intimacy among the members of the immediate family are usually very strong. Close relationship ties in family networks can facilitate exchanges of resources including information about HIV testing faster than would be possible in less dense, less bounded and larger networks.

Compared to other network ties, immediate family members usually feel a responsibility to care for each other. Immediate families are potential pathways through which individuals’ decisions to test for HIV can be influenced easily. In times of illness, family members usually provided the emotional and material support that was much needed including shelter and food to other members in need of support.
However, the study participants reported that informational support from immediate family members about HIV was sometimes lacking because open discussions on sensitive topics such as sexually transmitted diseases were usually avoided. The information about HIV that was shared in families was usually redundant because members of strong networks are less likely to obtain new information than those that are more dispersed (Granovetter, 1983). Participants also reported experiencing difficulties when they tried to discuss private issues with family members.

Findings showed that some parents minimized the risk for HIV infection that their children experienced. They often denied knowing that their children might be exposed to risk of infection with HIV. They believed that the teachings of their religious faiths against pre-marital sex and adultery were sufficient to prevent HIV. Some cultural values still associate the spread of HIV only with prostitution, homosexuality and drug abuse. Thus, it was assumed that all those who were not gay or prostitutes would not be exposed to risk for infection with HIV. Members with HIV often experienced shame, rejection, stigma and discrimination from their immediate families. Some participants felt that parents lacked the required HIV/AIDS expertise to be helpful. As a consequence of these problems, participants went to seek help from networks outside their immediate families in deciding to test for HIV:

I was thrown out of the family by my parents. They warned me that I would get imprisoned if I was discovered to be gay so I left my family. (Participant 21)

My family was ashamed that I was a sex worker. They accused me for spreading HIV so they sent me away from home. (Participant 13)

Family support for individuals seeking help to test for HIV was clearly lacking in some network compositions. When some parents became intolerant to cultures such as sexual identities that are
queer, participants turned to extended family members as an alternative for help in deciding to test for HIV.

Compared to immediate families, extended families were larger in size. Participants who left their unsupportive families to join extended families said that they were treated with empathy and tolerance by the substitute families or families of choice. They found that some extended families were less judgmental compared to immediate family members. Extended families did not usually reside in the same household or interact daily. They were usually separated by distance geographically and were larger than immediate families. Relationship ties among extended family members were less dense and not closely linked to each other as in the immediate families. Extended families provided safety nets to those who left their immediate family homes.

Some participants reported that they found it easier to discuss sensitive topics with extended family members more than with their immediate families. Some people were more likely to have access to more information about HIV testing from extended family than from immediate family members. However, some participants discovered that the attitudes and values of some of the extended family members about HIV and testing were not very different from those of their nuclear families. In addition, geographic distance and physical separation affected the degree of interaction and information exchange with extended family members. Reduction in the frequency of contact affected the degree of the influence of extended families in the decision to test for HIV.

The large size of extended families was a major concern for participants. Participants felt that because members were not intimately connected, extended families were less unlikely to treat information about HIV testing confidentially. Confidentiality of information includes any
form of information that identifies or can be readily associated with the identity of an individual related to the HIV status, risk behavior or health of an individual. Social network members were expected to maintain the privacy and confidentiality of information to ensure protection of members from fear, stigma and discrimination by the public. Some participants reported that they cut relationship ties completely with extended family members who gossiped about their HIV illness:

I stopped associating with my cousins. They gossiped about my illness and behaviour. To them, it was like I deserved to get HIV. (Participant 51)

In the present study, members of the acquaintances network included but were not limited to professionals, hair stylists, neighbors, mentors, pastors, workmates and schoolmates. The connections among acquaintances bring people into contact with a large and boundless pool of social network support. The acquaintance type of social network ties is heterogeneous and complex in structure. Relationship ties among acquaintances are less dense and weaker in structure and therefore they have a wider range of connections. Weaker and larger networks are perceived to have access to a wider range of informational resources (Granovetter, 1973) compared to resources from close friends or family networks.

Relationship ties in acquaintances are loosely connected, unstable, and are infrequently maintained. Acquaintances are less likely to be socially involved in interactions with one another over a long period of time. Acquaintances have been described as networks of opportunities because they link people to new ideas (Watts, 2003). The degree of intimacy and emotional attachment among acquaintances differs from that between kin members or friends. Acquisition of information from acquaintances was often incidental and non-purposeful (Veinot, 2009).
For gay participants and sex workers, in particular, acquaintances were more influential in the decision to test for HIV than friends or family network members. Since acquaintances see each other less often and are less emotionally attached, they sometimes engaged in discussions of sensitive topics such as gender identity more freely. Gay participants and sex workers discussed HIV testing with acquaintances without the fear of hurting the feelings of anyone. However, participants reported that the infrequent and informal type of communication among acquaintances reduced the obligation to treat HIV information privately. Since tie relationships among acquaintances are informal, they may break up easily or quickly, so control over confidential information would appear difficult.

I feared that if I said anything to them about HIV testing they would start telling the whole school that I have AIDS. (Participant, 48)

When you discuss HIV testing with someone, a lot more people around you will conclude that you have AIDS and they will start to discriminate against you. (Participant, 2)

The insights drawn from this study suggest that health organizations might benefit from a focus on social network-based strategies for HIV testing.

**Implications of the Role of Social Networks on HIV Testing**

The results from this study have important implications for both public health organizations and policy makers. There are many programs that use social network-based approaches to address HIV infection issues as distinct from more traditional approaches that have focused mainly on individual behavior change. Public health research has discovered that instead of serving as routes through which infection is transmitted, social networks play a major
role in transmitting information that influence individuals’ decisions to test for HIV and prevent further infections (Heckathorn et al., 1999).

Results of the present study corroborate findings from Davies (2009) who found that appropriate and supportive network-based programs improved transmission of information and ideas through communities in Kenya and Malawi. This research found that social network interventions performed better than the conventional approach in terms of number of people accessed (Davies, 2009).

Some research suggests that when existing networks are not working, new ones can be created to meet the resource gap (Heckathorn et al., 1999). The creation of new networks in the current study occurred when some participants left their parents to become permanent members of more tolerant and supportive fictive families. Substitute families supported them in the decisions to test for HIV. Network creation is self-directed or it can be determined by trained personnel in health care service. Pre-existing social network ties can be recruited into specialized personal networks creating new ties to influence the decisions of people seeking to test for HIV. This process can help where attitudes and values are insensitive towards people with HIV/AIDS (Veinot, 2009). Network modeling helped to provide personalized, emotionally attached and highly influential ties with influence on the individuals’ decisions to test for HIV.

In public health, the hard-to-reach population groups at high risk for infection with HIV can be recruited for HIV testing by making use of peers. Peers with HIV are used to identify others within their networks that they perceive have undiagnosed HIV infection and refer them for HIV testing. Peer-driven interventions provide the opportunity to recruit entire networks such as drug injection users, circles of gay men and women or sex workers for HIV testing. This approach is usually suitable for use in HIV high risk communities, who the current study
indicates are most influenced by acquaintances, that is, people with whom they have limited contact. These forms of networks, in particular, are not limited by geographic space or boundaries. The influence of social networks in one community could inspire fresh thinking in another community through bridging of networks (Watts, 1999).

Gay and lesbian participants said that they avoided HIV testing because of anxiety about possible stigma and discrimination by communities that associated these sexual identities with criminal offences. They were also concerned about how their families would react if they were known to have been tested for HIV. In this study, gay men and women responded readily to HIV testing messages from fellow gay men and women. Sex workers and gay people are hard to reach groups but they share information about HIV testing within their own groups.

Even though one policy implication of this study is working through personal social networks in trying to promote the importance of testing among persons who are HIV infected, the results suggest that type of networks that are important may vary by group and that a matching approach may be useful. The results showed that, in general, friends were key supporters of participants between 16 and 24 years old in deciding to get HIV testing. Friend-based approaches can be more effective in programs for increasing HIV testing for young people within this age group. Peers were perceived to be the most helpful source of support for HIV testing for sex workers, gay men and women in the sample. These findings corroborate those of previous studies (Hays, Catania, McKusick, & Coats, 1990) that lovers in gay men’s social networks were an important source of social support. Gay men and women among the participants tested for HIV in groups.

Results of the study also showed that there were more female than male participants who asked for advice to test for HIV from network members outside the family. Friends were more
likely than members of the immediate family to suggest HIV testing for married women. HIV is a delicate topic to discuss for some spouses. Understanding these patterns offers some clues for pattern matching (a technique for choosing or adjusting) network ties in conditional programming (Veinot, 2009).

In addition, programs strategies such as relationship-building, non-purposeful information acquisition or network capacity building can go a long way in increasing the influence of social networks in HIV testing. Training programs designed to strengthen the roles of immediate families, extended families, friends and acquaintances for promoting HIV testing can be helpful. Telephone hotlines and mobile units are ways that can be used to generate and maintain connections within and between networks required for helping those seeking to test for HIV.

Mutual testing (sexual partners being tested at the same time) offered female participants an option to protect themselves from threats of divorce from their husbands after testing for HIV. Mutual testing is a network strategy that ensures that partners in long-term relationship became aware of their HIV status (Exner, Hoffman, Parikh, Leu, & Ehrhardt, 2002). Exner et al. (2002) found that mutual testing encouraged many women to participate in HIV testing. Mutual testing was also seen by sex workers as a means to screen new sexual partners, to decide about condom use in ongoing relationships and to plan for a pregnancy. These are some of the social networks-driven innovations that can be designed by program managers to increase the rate of HIV testing for women and partners in long-term relationships.

However, it is important to understand that any sustainable HIV testing must be automatically linked to universal access to treatment and continuous health care (UNAIDS/WHO, 2010). Undocumented immigrants in Canada are unable to access drugs after
diagnosis with HIV because they did not have legal status to stay in the country (Rousseau et al., 2008). Female participants in this study were concerned that some men refused to disclose their HIV status to their wives. Those women were uncertain about their HIV status even after they had tested negative, if the HIV status of their sexual partners was unknown. Policies that encouraged mutual testing of sexual partners to test for HIV would resolve this problem. Stricter enforcement of policies about confidentiality would protect persons infected with HIV from unwarranted stigma and discrimination by the public.

Laws for convicting an individual for knowingly infecting a sexual partner with the deadly virus caused dilemma among people deciding whether or not to test for HIV (Blugh, 2010). Such laws impacted negatively in promoting HIV testing and did not help in preventing further HIV transmission (UNAIDS, 2007b).

For social network strategies to be more effective there is also need to rethink policies that make sex work and same sex marriages illegal. Support for sex workers and homosexuals to test for HIV is critical in the individual’s decisions to test for HIV. Laws and policies against sex work, gay men and women have been viewed as barriers to individuals seeking to test for HIV. Changes to these policies would make it easier for social networks to influence individuals’ decisions to test for HIV.

**Limitations of the Study**

There are some limitations to this research that need to be noted. Recruitment of the sample was by snowball method and this approach may have biased the interview sample towards including only people who had remained attached to the AIDS service organizations. There presumably are some potential participants with differing options or social networks who
were excluded from the sample because of a sampling method that recruited participants only through AIDS agencies. Note, however, that the majority of the sixty-two actual participants originally came from those countries recognized as HIV endemic (Read et al., 2004).

Retrospective collection of social networks data is dependent sorely on the memory of the participants and in the interval since testing participants might have forgotten some of their network members (C. J. Mann, 2003). Also, any attempt to define the characteristics of the participants’ social networks was not an easy matter because their social networks are not easily or directly observable. They had to be inferred by the researcher and then acknowledged as acceptable by the individual participant. Some social scientists have dismissed the use of such social networks in research as merely descriptive strategies that are not scientific. It is often argued that such assessments of network properties are subjective and lacking objectivity. However, this research, like many studies was more concerned with measuring a person’s perception of their world than measuring accurate networks.

Whatever criticism can be made about limitations of this research, the current study was able to provide knowledge on where to look for answers about how individuals’ decisions to test for HIV are influenced by social networks.

**Recommendations for Future Research**

Findings from the present study can only be seen as tentative. The results from this study suggest that further investigation would help us to further explain the reasons why strong ties with friends had more influence in the decisions to test for HIV than weak ties with acquaintances. This finding from the current study is inconsistent with Granovetter’s (1973, 1983) weak tie network theory. However, the contexts differ also. Granovetter’s research was
primarily about the strength of weak ties in the transmission of information providing access to the job market; this study focused upon the role of social networks in the decision to be tested for HIV, arguably, a more stressful life event. It might be that for more stressful events, strong ties such as friends and family assume greater significance.

The complex nature of the potential influence of both strong and weak social network ties in HIV testing need not remain unanswered. In addition, it will be useful for social network researchers to assess conditions that cause individuals to seek help from any type of network tie in the decision to test for HIV. Such research would help to guide the development of interventions targeting individuals facing a variety of challenges when deciding to test for HIV.

With social network tools, there is of course great potential for developing forms of open source network sites accessible to communities at high risk for infection with HIV. These network sites can connect communities reaching down to the level of families, friends and acquaintances affected or infected by HIV/AIDS (Davies, 2009).

Individuals changed their network preference at certain stages of disease development with HIV. At advanced stage of suffering from AIDS, for example, emotionally meaningful relationship was critical for individuals. Immediate family ties were more useful at this stage for material and emotional support. Future research in this area might also help in matching the most suitable social network interventions to serve the needs of individuals at the different stages of disease development of HIV/AIDS-related illness.

Current social network-based approaches do not take into account all the network variables that may influence individuals’ decisions to test for HIV (Wright, 2008). Future research would provide more light in this regard by examining other mediating variables that may influence individuals’ decision to turn to a particular network tie when deciding to get HIV
testing. The current study did not examine the situation in which participants used all types of social network ties. This element also awaits further research. The findings of this study showed that participants differed in their preference for network types depending on the particular situation that they were facing. It will be important for future research to determine the best fit of social network ties for individuals in different situations to maximize the influence of social networks in the decisions to test for HIV. For example, this study suggests that the needs of sex workers and gay people may differ from those who became infected through other circumstances.

The findings from this study also suggest that future research must pay particular attention to developing valid and reliable measures for closeness of relationship ties between network members. In the current study, it was complicated to distinguish between closeness within family relationships and closeness among friends. Some participants described their substitute families as friends but others regarded them as extended families. These grey areas can be clarified in future research. Future researchers need to further explore the definition and operationalisation of closeness to better understand how it affects strong and weak network ties.

A comparative study of the influence of social networks in different cultures would shed more light in our understanding of strengths and weaknesses of the different types of network ties in different social environments. Enhancing the effectiveness of social network-based interventions might require new innovations in program design to make interventions personally customized. Further research will be required to examine how social network-based interventions might be practically leveraged by using a combined mix of relationship ties rather than concentrating on just one for any particular target.
In addition to understanding the application of social networks ties to different targets, future research would explore possibilities of matching suitable network ties for particular groups such as health service workers, family members, friends and acquaintances who may need information aimed at increasing rates of HIV testing in a population. Research may identify lack of access to certain expert knowledge about HIV testing in a community. In addressing this gap in knowledge, health services can focus on building and facilitating network ties by using groups of peers to help with raising public awareness, for example, in stigma reduction and discrimination against people living with HIV/AIDS in communities. Generally, public health approaches within local communities have tended to focus on individuals, rather than embracing networks of whole communities (Veinot, 2009).

Research focusing on the use of social networks in communities to reduce fear and stigma against people with HIV will ideally be suited for interventions needed for addressing these complex elements in HIV prevention. Focusing on communities to fight against stigma and the fear of HIV testing would help to increase HIV testing rates.

Other areas that will need further research revolve around the following broad questions:

1. How can social capital be identified from social networks to help encourage community members decide to get HIV testing?

2. How do social networks of exclusion reproduce themselves to perpetuate stigma and discrimination against members in a community and how can these deterrents be addressed?

3. How can social networks play a greater role in a given community or region to influence HIV testing?
Taking communities as part of large social networks would help moving HIV testing programs from a reductionist focus to a pluralist approach in the fight against the HIV/AIDS epidemic. Traditional approaches tended to blame the victims of the HIV/AIDS epidemic. They failed to recognize that the fight against HIV is a social problem that has to be undertaken by collectively.

**Conclusions**

Findings from this study add to our understanding of the potential value of the role of social networks in the individuals’ decisions to test for HIV. Based on the findings of the current study, we know that individuals do not make decisions to test for HIV in isolation. Their decisions to test for HIV are influenced by social networks. Thus, the use of social networks-based approaches for HIV testing may target not only individuals, but also families, friends, acquaintances, communities and special groups at higher risk for infection with HIV.

Heckathorn et al. (1999) observed that network ties play dual roles in the HIV epidemic. In one role, networks serve as channels through which infection is transmitted across the population and in another role the same networks may be utilized as routes through which HIV prevention information may be disseminated. Geographically extensive networks that may accelerate the spread of infection may also be utilized to increase the effectiveness of HIV prevention efforts such as HIV testing. Social networks are effective for information transmission because they exist in the natural social environment.

The influence of social networks is not limited by geographical space. Social network influence can spread to areas beyond physical boundaries. Networks can quickly link up with other networks because they are able to bridge across boundaries. Starting from small
beginnings, successive waves of networks can reach out to hundreds other members. Heckathorn et al. (1999) noted that social networks have several features that make them well suited for accessing populations at risk of HIV infection. One of these features is that extensive network ties can influence a correspondingly broad area and increase HIV testing.

There was variation in the type of network that influenced HIV testing, but in this study the friend network was the most frequent source of influence. All networks, however, played a part in the everyday lives of the participants, providing support, information and advice. The assumption behind the use of social networks is that some individuals require network ties specifically tailored for them to influence their decisions to test for HIV. Dyadic social network interventions are those that target couples or sexual partners in long term relationships.

Small-group social network interventions are related to peer-groups of members meeting together for a specified purpose such as the training of sex workers in self-protective sexual behavior. Social network approaches can be used to target communities to induce widespread and durable culture about HIV testing throughout the target population. Influencing individual members to test for HIV can be difficult to do in communities where some strong cultural values would inhibit change hence the need for community-level networks strategies in that situation.

Participants in this study saw HIV testing as the only means that helped to access medical treatment. HIV treatment increased survival rates of people living with HIV. Universal access to HIV drugs by all those in need would save the lives of all those who get HIV testing and referrals to professional health care. It is important that both HIV testing and treatment are linked if social networks have to play their full role to influence HIV testing.

Reports from participants indicated that since the discovery of HIV treatment, HIV illness has been transformed from being a killer disease to a chronic illness. It is important,
therefore, for governments to ensure that antiretroviral drugs for treating HIV are accessible to all those who need them. There are problems of access to drugs, less health care services and inadequate health insurance in many countries. These factors still remain as major barriers to the role that social networks can play to influence individuals’ decisions to test for HIV in many developing countries. Unless these problems are addressed, expanding HIV testing will still be difficult. Irregular use of HIV drugs cause many side effects including developing resistance to treatment. HIV/AIDS survivors on continuous and long-life care are leading a normal life; they are able to marry and have normal children who are free from HIV infection.

With social network strategies, it is possible to take advantage of the personalized and low cost help available within a social network. AIDS service organizations can use the knowledge of where the social networks fail to concentrate limited resources on such areas rather than duplicating services that are already available within networks. Knowledge of the role of social networks can be vital in the design of programs that maximize service that could avert the shortage for professional services in remote areas and mitigate fears about burdening families and friends (Gourash, 1978).

This study broadens our understanding of how people access HIV/AIDS information and help from their networks. Compared to this sample those who choose not to be tested would continue to be unaware about their condition. Those who choose not to be tested and think that they have no infection get to know about their status by medical screening in health care settings when the disease progression is at advanced stage. HIV infection that is diagnosed late becomes complicated by many other opportunistic diseases and takes longer to treat. The findings of this study outline a potentially expanded capacity for health information services.


Appendix A

Cooperating Partner AIDS Service Organizations

African and Caribbean Council on HIV/AIDS
110 Spadina Avenue, Suite 207
Toronto, ON, M5V 2K4
Phone: (416) 924-5256

Africans in Partnership against AIDS
110 Spadina Avenue, Suite 207
Toronto, ON M5V 2K4
Phone: (416) 924-5256

Black Coalition for AIDS Prevention
110 Spadina Avenue, Suite 207
Toronto, ON M5V 2K4
Phone: (416) 977-9955

Women’s Health in Women’s Hands
2 Carlton Street, Suite 500
Toronto, ON, M5B 1J3
Phone: (416) 593-7655

Voices of Positive Women
66 Isabella Street, Suite 104
Toronto, ON M4Y 1N3
Phone: (416) 324-8703
UNIVERSITY OF TORONTO

Subject: Invitation to participate in a study investigating the effects of social networks in HIV testing.

To: _________________________________ (Agency)

Dear _________________________________

My name is Clement Jumbe and I am a Ph.D student in the Department of Adult Education and Counseling Psychology at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT). As part of the requirement for my Ph.D., I am carrying out a research study investigating the influence of types of social network in HIV Testing. The purpose of this letter is to ask for permission to involve your agency in my research.

Title of research study:
The role of social networks and social support in the decision to get HIV testing

Thesis supervisor:
Dr. Jack Quarter, telephone (416) 978-0820; email: jquarter@oise.utoronto.ca is supervising this study.

Information about the study and purpose of the research:
Many people are unaware of their HIV infection often until after developing a serious health condition. Therefore, we want to understand whether types of social networks do influence people to get tested for HIV. The knowledge to be gained will help to expand HIV testing, prevention and care.

Procedures:
The procedure is the completion of a questionnaire that will take approximately 60 minutes. This questionnaire will collect information regarding personal social networks and the influence of types of social networks in HIV testing. The researcher will read the questions to the participants and record all the answers. Personal networks will help to identify people who support other network members in deciding to get tested for HIV.
Exclusion criteria:
Research participants will be eligible if they are:

- African or Caribbean females and males
- 18 years of age or older
- Have had a voluntary HIV test in the past. (Voluntary HIV test excludes HIV testing for mandatory, immigration, prenatal care or any other reason.

They will participate whether they are HIV-positive or not.

Anonymity and confidentiality:
Confidentiality will be respected, and no information that could disclose their identity and that of their personal network members. The data collected will remain strictly confidential. The consents forms and questionnaires from participants will be stored separately. Responses from participants will not be associated with any name instead participants’ names will be converted to a code numbers or initials to ensure anonymity of information. Data will be stored in a locked and secure location and made available only to the thesis supervisor, Dr. Jack Quarter and members of the thesis committee, Dr. Ruth Childs and Dr. Sherida Ryan. Five years after the research study is complete, the questionnaire materials will be destroyed. The data will be used for scientific purposes only and any publication will not contain reference to any identity.

Participation and withdrawal:
Participation in this research is entirely voluntary. Participants may choose not to answer any questions. They have the right to withdraw from the study at any time without any penalty or affecting their access to health care services at any health care center.

Dissemination of research results:
The data collected will be used for scientific study purposes only. Any publication of these data for knowledge transfer and exchange, conference presentation or teaching will not contain reference to any identity. A copy of the results of the study will be made available to your agency.

Risks and benefits:
There are no direct benefits to be gained from participating in this study. Participants may expect to get a greater understanding of the influence of social networks in HIV testing and also have the opportunity to contribute to scientific research. They will receive $25 compensation for their time and traveling expenses. The researcher does not foresee any risk, harm, or inconvenience to be incurred by participating in this study. However, should there be any negative emotions to be experienced at all we will refer them to Africans in Partnership Against AIDS, African and Caribbean Council on HIV/AIDS in Ontario, Women’s Health in Women’s Hands, Black Coalition for AIDS Prevention and Voices of Positive Women for specialist support to mitigate these effects.
Problems or questions:
If you have any further questions about this study, you may contact the research supervisor, Dr. Jack Quarter at (416) 978-0820; iquarter@oise.utoronto.ca or the Office of Research Ethics at ethics.review@utoronto.ca, or (416) 946-3273.
I am requesting your agency to provide the following:

- Permission to post flyers at your agency for recruiting participants.
- Assistance to those who need to know more about this study.
- Professional support services, including counselling, should any participant experience any negative emotions from participating in the study.
- Assisting with screening of participants when necessary
- Any other useful guidance to ensure success of this research study.

In return, you agree to keep secret and confidential all information about the participants and will not disclose information regarding the status of such persons. The agency will ensure that only participants who were tested voluntarily and not for any other reason will be eligible.

The protocol and consent letters will be provided by the researcher at request from potential participants. Data collection for this study is expected to last three months from date of commencement.

**Consent Agreement**

We ____________________________________________________, the undersigned agree to support the study described above.

We have read the above information carefully and understand what is being asked and the accompanying conditions and promises. We understand the nature and limitations of this doctoral research being undertaken under the supervision of Professor Jack Quarter of the Ontario Institute for studies in Education, University of Toronto.

Name of agency or group: _______________________________________

Name of Director: ________________________________________________

Signature: ______________ Date: ___________________

Investigator’s name: ______________________________________________

Signature: ___________________________ Date: ___________________
Appendix C
Flyer for Recruitment of Participants

Research Participants needed

Are you 18 years of age or older?
Are you an African or Caribbean male or female living in the Greater Toronto Area?
Have you had a voluntary HIV test in the past? (Voluntary excludes mandatory HIV testing for instance during immigration process, prenatal care or any other reasons.)

Would you be interested in participating in a research study about HIV testing?

- Anonymity, confidentiality and privacy are assured.
- No further HIV testing will be done.
- Participation in this study is entirely voluntary.

To participate, Please contact Clement Jumbe:
Phone: 416-506-1848
Email: clemjumbe@gmail.com

or call, Amanuel Tesfamichael, Africans in Partnership against AIDS (APAA) 314 Jarvis St. Suite 102 Toronto, ON M5B 2C5 Phone: 416-644-1650 e mail outreach@apaa.ca

$25 will be provided to compensate your time and traveling expenses.
Appendix D
Consent to Participate in the Study of
Types of Social Networks and HIV Testing

Dear Participant:

Re: Effects of types of social networks in HIV Testing:

Title of research study:
The role of social networks and social support in the decision to get HIV Testing

Investigator:
Mr. Clement Alexander David Jumbe, Telephone: (416) 506-1848; email clemjumbe@gmail.com

Level of Project:
The study is being conducted for a PhD thesis by Clement Jumbe at the Ontario Institute for Studies in Education, University of Toronto under the supervision of Dr. Jack Quarter, telephone (416) 978-0820; email: jquarter@oise.utoronto.ca

I understand that my participation in this study is entirely voluntary. I can leave the questionnaire at any time and I have the right to refuse to answer any questions without penalty or loss of compensation.

First, as a participant it is important to know that:

1) The purpose of this research is to gain a better understanding of the effect of different types of social networks in HIV testing.
2) The procedure will be a single question-and-answer session lasting approximately 60 minutes. The researcher will read questions and record all the answers about how you decided to be tested for HIV.
3) The participant will receive no direct benefits from taking part in the study.
4) There is no known risk, harm, or inconvenience incurred by participating in this study. However, should there be any negative emotions to be experienced at all, Africans in Partnership against AIDS and Black Coalition for AIDS Prevention will provide extensive support to mitigate the effects.
Exclusion criteria: You can participate if you:
1) Are 18 years of age or older and of African or Caribbean origin
2) Are female or male
3) Have had a voluntary HIV test in the past. (Voluntary excludes HIV testing for mandatory, immigration, prenatal care or any other reasons).

You may participate whether you are HIV-positive or not.

Information about the Study and purpose of the research:
Many people are unaware of their HIV infection often until after developing a serious health condition. Therefore, we want to get greater understand about whether types of social networks influence people to get tested for HIV. The knowledge to be gained will help to expand HIV testing, prevention and care.

Procedures:
The procedure is the completion of a questionnaire that will take approximately 60 minutes. This questionnaire will collect information regarding personal social networks and their effects in making decisions about HIV testing. The researcher will read the questions and record all the answers from the participants. Personal networks will help to identify people who support other network members in deciding to get tested for HIV.

Anonymity and confidentiality:
Confidentiality will be respected, and no information that could disclose your identity and that of your personal network members. The data collected will remain strictly confidential. Your consent form and questionnaire will be stored separately. Your responses will not be associated with any name instead your name will be converted to a code number. Letters of alphabet will be used for members of your personal network to ensure anonymity of information. It will be impossible to associate any of your personal details with results from the study. However, the researcher will maintain a record of your name to offer you the possibility to participate in further studies if you agree. Data will be stored in a locked and secure location and made available only to the thesis supervisor Dr. Jack Quarter and members of the thesis committee, Dr. Ruth Childs and Dr. Sherida Ryan. Five years after the research study is complete, the questionnaire materials will be destroyed. The data will be used for scientific purposes only and any publication will not contain reference to your identity.

Participation and withdrawal:
Asking questions about HIV/AIDS can be upsetting to some individuals. Your participation in this research is entirely voluntary. You may choose not to answer any questions or withdraw from the study at any time and that you will continue to access the same health care services at any health care service provider without any penalty.

Dissemination of research results:
The results of this research may be published in a scholarly publication or reported in a scientific journal for knowledge transfer and exchange, conference presentation or teaching, in which case, the identity of all participants will remain fully confidential.

Risks and benefits:
There are no direct benefits to be gained from participating in this study. By participating, you may expect to get a greater understanding of the influence of social networks in HIV testing and also have the opportunity to contribute to scientific research. You will receive $25 compensation.
for your time and traveling expenses. The researcher does not foresee any risk, harm, or inconvenience to be incurred by participating in this study. However, should there be any negative emotions to be experienced at all we will refer you to Africans in Partnership Against AIDS, African and Caribbean Council on HIV/AIDS in Ontario, Women’s Health in Women’s Hands, Black Coalition for AIDS Prevention and Voices of Positive Women for specialist support to mitigate these effects.

Problems or questions:
The researcher will answer any other questions about the research either at the beginning or during the course of the question-and-answer session. If further questions or concerns arise, Dr. Jack Quarter at (416) 978-0820 or jquarter@oise.utoronto.ca and the Office of Research Ethics at ethics.review@utoronto.ca, or (416) 946-3273 will be happy to address them.

CONSENT TO TAKE PART IN A THE STUDY:

Consent Agreement:
I have read the above information and understand the purpose of the study. Upon completion of my participation, I will receive $25 compensation for my time and cost of traveling. I have not waived any legal rights by signing this consent form. I will be given a copy of this informed consent form. By signing this consent form, I agree to take part in this study.

_______________________________         _________________
Signature of participant             Date

PRINT NAME: ____________________

_______________________________         ____________________
Signature of researcher (investigator)          Date
Appendix E

Questionnaire

FOR OFFICE USE ONLY: APPENDIX C. Reference number: __________. Date ________________

CONFIDENTIAL

Day of interview:

Monday ..... 
Tuesday ..... 
Wednesday ..... 
Thursday ..... 
Friday ..... 
Saturday ..... 
Sunday ..... 

Time of day interview began ................................... __ ___ : ___ ___ AM/PM
Time of day interview ended ................................... __ ____ : ___ ___ AM/PM
Interviewer’s name ....................................... Place ..................................

Thank you for participating in this important study about HIV testing. The questions you will answer are about your relationshios with other people and HIV testing. No special knowledge is required to answer the questions. There is no right or wrong answer. I am looking for the answers that correspond to your reality. If you do not understand the questions or would like me to offer you more information, please feel free to ask me.

The questionnaire should not take more than 60 minutes to complete, and I hope you will find it interesting and enjoyable. Any answers you give will be treated as confidential and anonymous.

To begin, I would like to get some background information on you. Remember that you do not have to respond to a question that you feel uncomfortable answering.

Section 1: Background information

1. Your age is between (a) 16-24 years __, (b) 25-34 years __, (c) 35-49 years __, (d) 50-64 years ___, (e) 65 + ___.
2. In what country were you born? Country: ___________________ Ethnicity ___________________
3. How do you identify yourself? Female __, male __, bisexual ___, Trans gender ____, other ___ (specify)
4. What highest level of schooling have you completed? Elementary ___ Secondary __ College __ University ___
5. Are you presently working? Full-time ___ part-time, ___ retired, ____ unemployed ____ student ____
6. Year you were last tested for HIV __________
7. Were you tested in Canada? Yes _______ No ______.
8. What were your reasons for getting tested? Mandatory reasons _____ for immigration purposes _____ pregnancy reasons ____ voluntary _______ other reasons ____________________ (specify)
9. Which of the following categories best described your personal and household income (Before Tax) in the year you were tested for HIV? Include salaries, wages, interest, profits, pensions and support from children, social welfare, Ontario Disability Support Program (ODSP) or any other sources. (CHECK ONE ONLY WHETHER YOU WERE EMPLOYED OR NOT)
Section 2: Information about network members

It is most important in this study to discover your personal relations. I would like you to think of the significant people with whom you discussed important issues in your life or asked for advice at the time when you decided to get tested, for example your immediate family members, extended family members, friends and other acquaintances (e.g. doctors, professionals, counselors, mentors, neighbors, school mates, work mates, colleagues, boss, fellow club members or association members). I would like the initial of the first name and the first letter of the family name only of these persons. Enter as many names as you can in the name box below. You will be asked some additional questions about those people. I will not contact these people and any names you give will be treated as confidential.

<table>
<thead>
<tr>
<th>NO.</th>
<th>1. First name and first letter only of second name</th>
<th>2. Sex</th>
<th>3. Age range (a) to (e) as above</th>
<th>4. Yrs. known</th>
<th>5. Relationship to participant</th>
<th>6. Marital status</th>
<th>7. Kind of education</th>
<th>8. Type of occupation</th>
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</table>

2. Which of these persons is female?

*Interviewer: I mark ‘F’ in first column for female and ‘M’ for the rest.*

3. How old were these persons?

*Interviewer: I record ages in middle column.*

4. How long had you known these persons?

*Interviewer: I record number of years known in last column.*

5. How were you related to each of these persons?

*Interviewer: I check the corresponding type of relationship with each member.*

6. Which of these persons lived with a spouse or a partner?

*Interviewer: Check in appropriate column for ‘Marital status’.*

7. What kind of education did these persons complete?

*Interviewer: Record for elementary 1, secondary 2, college 3 and university 4 I don’t know 5 in column 8.*
8. What was the occupation of these persons?
*Interviewer: Record the occupation of each person in the column ‘Type of occupation’.*

9. With whom did you usually engage in the following experiences?
*Interviewer: check in the appropriate box for the person and make rating of frequency of activity using a scale 1 to 5: 1. Hardly ever, 2 Rarely, 3 Sometimes, 4 Often, and 5 All the time*

<table>
<thead>
<tr>
<th>Personal experience and social support</th>
<th>Number in the list of person engaged with</th>
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<tbody>
<tr>
<td>A. Shared a meal or went to parties with</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>B. Visited you or invited you over</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>C. Borrowed or lent money to</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>D. Discussed personal/private matters with</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
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<tr>
<td>E. Comforted you if you were upset</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>F. Listened to you if you needed to talk about your feelings</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>G. Encouraged you to do something about your situation</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
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<tr>
<td>H. Supported you when in your stressful situation</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>I. Helped you to figure out what you wanted to do with your situation</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
</tbody>
</table>
J. Told you your situation was similar to hers or his

1 2 3 4 5 6 7 8 9 10

K. Helped you to take your mind off your hurtful situation.

1 2 3 4 5 6 7 8 9 10

L. Showed you someone who could help

1 2 3 4 5 6 7 8 9 10

M. Showed you affection and did not judge you

1 2 3 4 5 6 7 8 9 10

N. Provided you with transportation, a place to stay or any help.

1 2 3 4 5 6 7 8 9 10

Section 3: Description of your relationship

10. The following section refers to network members identified in section two. From the list, please indicate how close you were to each person you have named?  Interviewer: Check in appropriate box.
11. How often did you meet or have contact with these persons (including by telephone, letters or e-mail?)  

*Interviewer: Check in corresponding box.*

<table>
<thead>
<tr>
<th>No</th>
<th>First name and first letter only of second name</th>
<th>Level of social contact or communication with members</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td>5. daily</td>
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<td>01.</td>
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<td>03.</td>
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</table>

12. Did persons in numbers 1 to 10 know each other? Answer yes or no.  

*Interviewer: Record answer in corresponding box. If Yes circle A, if No circle B and proceed until to the last pair on the list.*

<table>
<thead>
<tr>
<th>No</th>
<th>Person</th>
<th>Did person number 1 know persons number 2 to number 10?</th>
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<tbody>
<tr>
<td>01.</td>
<td>1</td>
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<tr>
<td>02.</td>
<td>A/B</td>
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<td>03.</td>
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<tr>
<td>04.</td>
<td>A/B</td>
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<td>05.</td>
<td>A/B</td>
<td>A/B A/B A/B 5</td>
</tr>
</tbody>
</table>
Answer the following questions:

13. Did any of the persons on the list influence you to get tested? Yes ___ or ___ No. If yes, please check box of person (s) who influenced you to get tested. (CHECK NAMES)

14. Why did you go to these people for advice to get HIV testing?

_______________________________________________________________________
_______________________________________________________________________

15. Who else did you go to for advice to get tested?

_______________________________________________________________________

16. What made you talk to these people about HIV testing?

_______________________________________________________________________

17. The total network comprises (1) Immediate family members, (2) extended family members, (3) friends or (4) acquaintances please indicate the extent each of these influences HIV testing for anyone looking for advice?

Using the most appropriate response for each on the scale 1 to 5:

<table>
<thead>
<tr>
<th></th>
<th>1 Very weak</th>
<th>2 Weak</th>
<th>3 strong</th>
<th>4 Fairly strong</th>
<th>5 Very strong</th>
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<tbody>
<tr>
<td>A. Immediate family members</td>
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<td>B. Extended family members</td>
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<td>C. Friends/peers/mates</td>
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<td>D. Acquaintances</td>
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<td>E. Anything else? Please explain</td>
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</table>
18. Would your assessment of the influence of these groups of people on HIV testing be the same at all times for the people in your community?

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

THANK YOU VERY MUCH FOR TAKING THE TIME TO ANSWER THIS QUESTIONNAIRE.