ASSESSMENT OF HOME BASED HIV TESTING AND COUNSELING SERVICES IN ENHANCING ACCESS TO TREATMENT, CARE AND HIV PREVENTION IN KIBERA INFORMAL SETTLEMENTS, NAIROBI, KENYA

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(Public Health)

JOMO KENYATTA UNIVERSITY OF

AGRICULTURE AND TECHNOLOGY

2018

Assessment of Home Based HIV Testing and Counseling services in enhancing access to treatment, care and HIV prevention in Kibera informal settlements, Nairobi, Kenya

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A Thesis submitted in partial fulfillment for the Degree of Doctor of Philosophy in Public Health in the Jomo Kenyatta University of Agriculture and Technology

2018

DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

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DEDICATION

This thesis is dedicated to my late mother Mary Hellen Apiyo Odera who without a career was determined to educate me and laid the foundation that has enabled me reach this far. To my children; Tony, Jackie and Michelle who truly believe that I am very resilient. To the many friends who have supported me through this long journey.

ACKNOWLEDGEMENTS

I am indebted to the Almighty God for his mercies and protection and giving me the stamina to walk this journey. This has been the longest journey in my academic life. Glory be to God for helping me all through it and bringing it to this fruitful end. My immediate family, husband Julius and children Tony, Jackie and Michelle have been very supportive and gave me the space during the long hours I sat working on this thesis. I appreciate you all for the support and love.

Secondly I want to acknowledge and sincerely thank the many friends for their encouragement when I wanted to give up. Of special mention is my colleague Thomas Achia, PhD for his patience, humour and bearing with me through the never ending statistical analysis requests that I made. Thank you Tom.

I would not be doing justice if I did not specifically mention the great support and encouragement and constructive comments I received from my supervisors Prof Zipporah Nganga of South Eastern University (formerly of JKUAT), Prof Mohammed Karama of Umma University (formerly of KEMRI) and Dr. Joseph Oundo of USAMRU. I have no words strong enough to thank you, may God bless you richly.

This study would not have succeeded if I did not have a dedicated team of KEMRI staff who took the lead in the testing and counselling in Kibera, the four supervisors; Alfred Obara, James Langat, Rita Okeyo and Reginald Okayo under the leadership of David Mutinda who also took notes during focus group discussions and did the tedious work of transcription of the of the notes. The solid foundation and planning for Kibera entry had been led by Fillet Lugalia then the coordinator of the team who even though she left, had formed a cohesive team. To you all I say thank you very much. To my employer Centers for Disease Control and Prevention (CDC) and the management for enabling me work on this project and study and staff both locally and in Atlanta for reading and critiquing the manuscripts from this study, I say thank you very much.

Lastly I want to sincerely thank the participants and residents of Kibera who were very responsive during the focus group discussions and the individual interviews. In them I found a very friendly community and without them, this work would not have materialized. Thank you all and God Bless.

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ABBREVIATIONS AND ACRONYMS

ADS Associate Director of Science

AIDS Acquired Immune Deficiency Syndrome

AMPATH Academic Model for Providing Access to Health care

ART Anti Retroviral Therapy

ARV Anti- retroviral drugs

BPS Board of Post graduate studies

CDC Centers for Disease Control and Prevention

DGHT Division of Global HIV/AIDS and Tuberculosis

DNA Deoxyribonucleic acid

DTC Diagnostic testing and counseling

FGDs Focus Group Discussions

FP Family planning

HAART Highly Active Anti-Retroviral Therapy

HBM- Health Belief Model

HBTC Home Based Testing and Counseling

HTC HIV Testsig and Counseling

IMC International Medical Corps

JKUAT Jomo Kenyatta University of Agriculture and Technology

KAIS - Kenya AIDS Indicator Survey

KDHS Kenya Demographic and Health Survey

KNASP Kenya national AIDS strategic plan

KNBS Kenya National Buraeu of Statstics

KEMRI Kenya Medical Research Institute

L-STIK Longitudinal survey of treatment in Kenya

MTCT Mother to child transmission

NAAT Nucleic acid amplification testing

NASCOP National AIDS and STI Control Programme

NACC National AIDS Control Council

NGO Non Governmental organization

PITC Provider initiated testing and counseling

PCR Ploymerase chain reaction

RNA Ribonucleic acid

STI Sexually Transmitted Infections

UNAIDS United Nations Program on AIDS

VCT Voluntary Counseling and Testing

VMMC Voluntary Male Medical Circumcision

WHO World Health Organization

ABSTRACT

Home based testing and counseling is an innovative strategy geared to increase access and uptake of HIV testing services by the population by reaching those who for various reasons have not had a chance to test for HIV. Knowledge of one's HIV status provides those who are negative with the opportunity to remain HIV-free through the HIV prevention messages delivered during testing and counselling. These prevention messages are given as a one time off session and it is expected that the individual fully utilizes the knowledge gained to prevent contracting HIV infection. Individuals diagnosed with HIV are reffered to access HIV treatment services, and are offered prevention messages to prevent re-infection and transmission of HIV to others as well. Home based testing and counseling (HBTC) services had been offered to the whole of Kibera slums community through their participation and by their involvement through the use of the Health belief model between 2009-2011 to increase uptake of services. The factors associataed with HBTC uptake, the effect of HBTC in enhancing; uptake and utilization of the prevention messages and access and retention on HIV treatment have not been investigated in Kibera informal settlement. The objective of this study was therefore to assess the role of home based testing and counseling in enhancing testing uptake; access and retention on ART and utilization of HIV prevention messages provided at HBTC in Kibera informal settlement in Nairobi city. This was a cross sectional mixed method study comprising of individual interviews using a structured quaestionnaire for individual interviews and focus group discussions using a focus group discussion guide. Data collected included; experiences with HIV testing and counseling, knowledge and utilization of HIV prevention messages including condom use; experiences with couple testing services and challenges associated with access to care and treatment for those who were diagnosed with HIV. Additionally HIV testing services were offered to those who reported HIV negative status. The quantitative data was analyzed for frequencies, cross tabulations and chi square test with significance set at 0.1%. Logistic regression was used to determine significant factors. Multiple correspondence analysis (MCA) was used to construct a composite prevention message index and calculate the weights using STATA 13 (Stata Corp, 2013) to determine the prevention messages received by the participants. Overall, 75% of the participants had tested in the previous HBTC with 97.7% being satisfied with services offered. Sex, age, education, marital status and previous experience with HBTC were all significantly associated with uptake of HBTC ($p=0.001$ for all these demographic characteristics respectively. Couple testing rates, dropped from 33.9% in 2009-2011 to 19.7% in 2012. Thematic content analysis was done for the qualitative data using Atlas ti 3.0. Negative consequences to the marriage stability as a result of HIV discordant results was the most commonly cited factor for fear of

couple testing. Provision of prevention messages was significantly higher among HBTC clients compared to clients from other testing sites; partner reduction counselling (64% versus 52%) and faithfulness (78.3% versus 67%); P= 0.001 respectively. Participants reported no change from risky sexual behavior with condom use at 10.7%. Women had less odds (OR 0.46, 0.25-0.83 CI 95%) of practicing safer sex. Trust of the sexual partners and fear of suspicion of infidelity were the main reasons for not using condoms. The focus group discussions overwhelmingly reported multiple sexual partnerships among both HIV negative and positive participants. Prevalence of HIV among participants who believed they were free from HIV infection on account of negative HIV results at previous HBTC in the settlement was 2.4%. Enrolment to treatment services was 93% despite the delay associated with individuals seeking confirmation of positive results from other testing places and other individuals waiting until they became sick. HIV infected individuals experienced psychosocial barriers related to poor provider–client interpersonal relationships which influenced retention and adherence to care and treatment negatively. In conclusion, this study found that whereas HBTC promoted HIV testing uptake and although the prevention messages delivered during HBTC are accepted and appreciated in this community, their utilization to prevent HIV acquisition is low in both the HIV negative and positive individuals. Access to treatment is high but challenges exist that influence retention. Innovative strategies for change of normative beliefs about sexual behavior are urgently needed. Community wide education on HIV discordancy is required to mitigate the low couple testing found here associated with fear of consequences of HIV discordancy results in marriages. Continous provider capacity building is necessary to improve on client retention on treatment. Adherence counseling should be patient rather than hospital centered.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Infection with the Human Immune - Deficiency virus (HIV) results in progressive destruction of CD_4 T-lymphocyte cells that support the immune system. The infected individual becomes more and more susceptible to other infections termed opportunistic infections. These opportunistic infections are the cause of death if the individual does not get treatment.

HIV testing and counseling (HTC) is the primary entry point to HIV prevention, care and treatment services (Kurth *et al*., 2015). Knowing one's HIV status provides those who are negative with the opportunity to remain HIV-free and those who are HIV positive, the opportunity for continued counseling and access to treatment, care, support and prevention of re-infection and transmission of HIV to others. However in sub-Saharan Africa, less than 10% individuals know their HIV status and hence miss out on the ever increasingly available and life-saving Anti-retroviral drugs (ARVs). This called for the introduction of more innovative approaches to testing and counseling to increase access and uptake of the services by the population (Matovu *et al.*, 2007) with an aim of increasing access to treatment and care for those who test HIV positive and prevention of infection for those who test HIV negative.

Kenya adopted the United Nations General Assembly Special Session on HIV and AIDS (UNGASS) goal for universal access to prevention, care and treatment of HIV and AIDS (UNAIDS, 2010). The Kenya National Aids Strategic Plan 111 (KNASP 111) 2009-2013 (NACC, 2009) aimed at achieving 80% knowledge of HIV status by Kenyans by 2013. The Kenya HIV and AIDS testing guidelines (NASCOP 2008) promoted the use of innovative approaches for increased coverage and early diagnosis of HIV. The

introduction and use of innovative approaches of taking testing services to the clients to increase the uptake of testing and counseling followed evidence that these approaches were effective and successful (Marks *et al*., 2007). Other mitigating factors and strategies geared towards the reduction of HIV prevalence include reduction in number of sexual partners, delayed sexual debut among young people, increased consistent and proper condom use and mass media education on prevention strategies (NASCOP, 2008). There have been various approaches employed in the provision of HIV testing and counseling to the population since the inception of testing and counseling services. These approaches include client initiated testing and counseling (CITC) encompassing stand-alone VCT centers, integrated VCT centers, and provider initiated testing and counseling (PITC) services in health facilities which include diagnostic testing and counseling (DTC). Even with all the above efforts, the number of people accessing HIV testing services and who had knowledge of their correct HIV status was still low, even with a triple increase from 16% (KAIS., 2007) to 47% in 2012 (KAIS., 2012). The number of Kenyans who have accessed testing and counseling increased from 48% in 2009 (KNBS2010) to 72% in 2012 (KAIS 2012). With low knowledge of correct HIV status, many individuals who would otherwise benefit from early commencement of treatment do not do so. A study in France suggested that the factors considered as low risk for HIV infection including; heterosexual steady long term partnerships, being male over 30 of age were found to be associated with late HIV testing and linkage to treatment as compared to homosexuals who used the services more frequently (Delpierre *et al*., 2007).

Taking services to the clients mitigate some of the barriers such as distance, lack of financial resources and stigma leading to fear of being seen when going for services (Weiser *et al*., 2006) that hinder clients from accessing services. Low HIV risk perception hinders individuals from seeking HTC services and additionally most individuals are well and it is unlikely that, they would seek testing and counseling for HIV services out of their own motivation given the challenges cited above. Home Based

Testing and Counseling (HBTC) service is where a qualified and certified service provider visits the home or house of a client and with the client's consent offers the HIV testing services (NASCOP, 2008) to overcome the barriers experienced. Home based testing and counseling (HBTC) is thus geared towards increasing access to testing services and clients diagnosed with HIV are referred appropriately for early assessment and commencement of treatment or care. In a Malawian study, the rural population were 70% more likely to have accessed testing and counseling services in HBTC than in any other approach (Helleringer *et al*., 2009)

Clients may see HBTC as providing a greater assurance of confidentiality than visiting a VCT center. The community mobilization for services that precedes HBTC makes services acceptable and everybody expects to be visited. A trial in Zambia found that individuals randomized to home testing were four times more likely to accept the services than those assigned to health facility testing (Fylkesness *et al*., 2004). Tested persons are counseled and provided HIV results in real time with the exception of children less than 18 months of age, who need Polymerase Chain Reaction (PCR) antigen test to confirm HIV status (NASCOP, 2010).

Home based testng and counselling (HBTC) is cost-effective as it reaches the highest number of individuals who had never tested (Menzies *et al*., 2009).Studies in Malawi and Uganda where the HIV and AIDS disease burden is similar to the Kenyan situation have shown that home based testing and counseling is highly acceptable to clients and is a successful strategy (Bateganya *et al.,* 2009; Menzies *et al*., 2009). In Uganda, HBTC was implemented successfully in Rakai and Bushenyi districts, where acceptance was over 90% among 350,000 people who were offered the test (Matovu *et al.,* 2007). In a study to determine the factors influencing uptake of VCT in Bushenyi district in Uganda, it was found that increased mobilization, reduction in costs, and linkage to care and provision of high quality VCT services increased the number of people seeking VCT (Nuwaha *et al*., 2010).

Home based testing and counseling has several advantages; there is no cost to the client in terms of travel and stress; the client if married will receive services with the spouse thus addressing issues of prevention if there is HIV discordance (in which one partner is HIV positive and the other HIV negative) and promoting acceptance and support for each other. In addition it provides opportunities for the whole family to be tested together, which promotes disclosure and garners support within the family for prevention, care, treatment and support (Weidle *et al.*, 2006; Were *et al.*, 2006). A study conducted both in Rwanda and Zambia showed that most HIV infections occurred among the married or cohabiting couples (Dunkle *et al*., 2008). Equally in Kenya, heterosexual sex within unions or regular partnerships account for 44.1% of new infections **(**Gelmon *et al*., 2009). These are trusted relationships and therefore no form of protection is used during sexual intercourse. The problem of lack of knowledge of partner status and understanding of discordance even where one partner is already on ARV treatment has persisted for long. (Kabatesi *et al.,* 2002; N'Gbichi *et al.,* 1995; KAIS., 2012). A study in Uganda among the HIV positive people who were already on ARV found 88% of risky sexual behavior at baseline and 86% risky sexual behavior at follow up. This would imply that even those who know that they are HIV positive do not necessarily become more careful (Bunnell *et al.,* 2006). Home based testing and counseling offers an opportunity that promotes mutual understanding of the risks, mutual disclosure necessary for support for treatment, care and prevention of infection to the uninfected partner.

HIV discordance is about 45% among the HIV positive married and cohabiting individuals in Kenya (Kaiser *et al*., 2011). In addition, the HIV infection risk perception is still very low with 80.9% men and 68.8% women believing that they are at no or low risk of contracting HIV infection (KAIS, 2012). Besides most of the population are not sick and will not necessarily go to the health facilities and would therefore not access provider initiated HIV testing and counseling offered in health facilities (PITC). These findings call for the promotion and scale up of a strategy targeting couples with services

of HIV testing and counseling. In evaluating HBTC, Bateganya *et al*., (2009) found that there is insufficient data to recommend large scale HBTC. However a study in Kenya found that through HBTC, the highest number of HIV discordance was diagnosed and facilitated early enrollment into care as those clients from HBTC had the highest CD4 count levels compared to other strategies (Kimaiyo *et al.,* 2010). Early enrolment makes the client get the full benefit of treatment, as late presentation is associated with lower treatment response rates, higher mortality and increased treatment costs and possibly increased transmission of HIV (Sabin *et al., 2004;* Badri *et al., 2006).*

1.2 Home Based Testing and Counseling in Kenya

HBTC programs started in Kenya as pilot programs both as part of research and as general service provision. With support from the President's Emergency Plan for AIDS Relief (PEPFAR), the International Medical Corps (IMC) implemented door-to-door HBTC in Suba district, an area with the highest (35%) estimated HIV prevalence at the time (KAIS 2007) in the country. Program data showed that there was 90% acceptance among the 8,000 clients reached. Another two pilot studies on HBTC were undertaken one in Western Kenya and the other in Kibera informal settlements but in a limited area as part of the disease detection surveillance program within the KEMRI/CDC Health and Demographic surveillance site (HDSS) areas. HBTC acceptance was 76% and 84% respectively in both sites (Dalal *et al.,* 2013). These results led to the expansion of HBTC outside the DSS study area in Kibera informal settlement and other areas of high population density in the country. In the Rift Valley province in a rural community, the Academic Model for Providing Access to Health care (AMPATH) achieved 90% acceptance of HBTC among the individuals who were reached. HBTC also diagnosed the highest number of HIVdiscordance among couples reached in that population and also turned out the highest number of clients who were not ill but were ready for ARV treatment as compared to other testing strategies (Kimaiyo *et al.,* 2010).

Scaling up HBTC would increase access to HTC and offer the opportunity for couples to be counseled and tested together. It has been demonstrated that individual testing is associated with non- disclosure of HIV status to sexual partners (Medley *et al.,* 2013) and this occurring in an area where HIV discordance (where one person is infected and the partner is not) within couples is high like in Kenya (KAIS, 2012) is a fertile ground for heterosexual HIV transmission within the marriage. HIV discordance among married couples with an estimated 43% of women and 44% of HIV positive men having a HIV-negative spouse (Medley *et al*., 2013). Couple testing and counseling in the Demographic Surveillance System (DSS) area in Nyanza accounted for 38% of those tested with 7.9% of those testing positive being HIV discordant (Dalal *et al.,* 2013). Individuals identified as HIV-infected get the opportunity of being referred for care and treatment services while the HIV free persons are equipped with prevention skills which include consistent use of condoms, reduction in number of sexual partners to one faithful HIV uninfected partner, STI treatment and knowledge of HIV status in order to remain HIV negative. Uninfected uncircumcised men are also referred to voluntary medical male circumcision (VMMC) services. HIV positive individuals are referred to access treatment and care with anti-retroviral drugs and drugs against opportunistic infections. Treatments with anti-retroviral drugs has an impact in reducing the viral load to undetectable levels thus reducing HIV transmission, morbidity and mortality due to AIDS especially when initiated early (Cohen *et al.,* 2011). Early treatment has also been demonstrated to be cost effective (Koenig *et al.,* 2011).

1.2.1 Home based testing and counseling in Kibera using psychosocial approaches; Community Participation and Health Belief Model

Following the results from the HBTC pilot program in the Kibera HDSS area in 2008, an integrated HBTC approach of using community participation and health belief model constructs was implemented in Kibera slums from 2009 to 2011. The aim of the program was to increase access and saturate the population with HTC services. A model of community participation composed of a three step process of community entry,

community mobilization and involvement; and considering cultural differences in the community was used to promote community access to and ownership of services. Four constructs of Health Belief Model were used by the HTC service providers visiting individual households to examine the individuals' current HIV knowledge, beliefs and behaviors around HIV to assess perceived HIV vulnerability or HIV risk, perceived severity, perceived benefits of alternative action and perceived barriers, including costs and disadvantages of adopting new behavior or alternative course of action. In this implementation 95.7% of the residents who were enumerated accepted to participate in the counseling and education session and out of those 99.7% took the HIV test (Oluoch *et al.,* 2017). The HIV prevention strategies discussed included abstinence for those not married, need to have sexual partners tested for HIV and condom use, education about ART and referral to ART services for those who tested HIV positive. Condom use was encouraged, demonstration was done and free condoms offered to clients who were sexually active and they were also directed to where they could obtain additional condoms in future.

1.3 Statement of the Problem

Despite the rapid expansion of sites offering testing and counseling services from an initial 3 in 1999 to about 3000 in 2009, only 48% of Kenyans reported having accessed testing and counseling services (KNBS2010). This has since improved to 72% of the population having tested at least once (KAIS 2012). HIV discordance rates in married and cohabiting men and women who are HIV positive and who continue to have unprotected sex is high (5%) and condom use is low in women (3.8%) and in men (5.2%) (KAIS, 2012). Clients who seek testing services most often do so individually and do not disclose their HIV status to their sexual partners and if they are HIV positive, they continue to put their sexual partners at risk of infection by having unprotected sex (Kaiser *et al.,* 2011). Additionally, the majority of women and men perceive themselves to be at no risk of HIV (35.3% women, 39.6% men) or small risk (33.5% women; 41.3% men) of contracting HIV infection (KAIS 2012). As a result,

individuals are diagnosed with HIV late and do not benefit from the anti-retroviral therapy (Sterne *et al.,* 2009) which is offered free in the country either because of lack of knowledge of status or failure to take up referral services (Cherutich et *al*., 2012).

HBTC was introduced to enhance and promote greater access to testing services, to diagnose HIV positive clients early and link them to treatment, reach and diagnose HIV discordant couples and offer comprehensive HIV prevention messages to all clients testing negative to prevent HIV acquisition and help them maintain their HIV negative status and those diagnosed with HIV to prevent HIV transmission. The effect of HBTC in achieving these objectives has not been assessed in Kibera informal settlements. It is presumed that prevention messages delivered as one time off are effective in helping residents mainatian their HIV negative status and clients diagnosed with HIV and referred tfor treatment access and remain active on treatment.

1.4 Justification of the study

This study area was chosen because Kibera informal settlements has an HIV prevalence 8% over and above the national average (KAIS 2012). Additionally, HBTC was offered to all residents of Kibera informal settlement between 2009-2011, but its effect in achieving its objectives have not been assessed. Without knowledge of factors influencing uptake, the services cannot be improved. Lack of utilization of prevention messages leads to increased vulnerability to HIV and increased transmission rates to the non HIV infected. The economic and productive life of those HIV infected individuals is curtailed due to increased morbidity associated with lack of HIV treatment. Additionally the health burden is increased due to overstretching of the scarce health resources in treating individuals with HIV opportunistic infections. The knowledge generated from this study will inform the national program in making decisions about the expansion of Home based testing and counseling services beyond the current specifications in the national guidelines, in order to increase access, reach more couples together, increase

access to care and treatment and promote utilization of HIV prevention strategies and messages.

1.5 Research Questions

- What are the factors associated with uptake of HBTC in Kibera informal settlement?
- What are the factors that influence couple and sexual partners' HIV testing in HBTC?
- What are the factors associated with utilization of HIV prevention messages for behavior change among clients who previously tested HIV negative in Kibera informal settlements?
- What are the challenges associated with utilization of HBTC referral to treatment and care services in Kibera informal settlement

1.6 Objectives

1.6.1 General Objective

To assess the role of Home Based Testing and Counseling in enhancing testing coverage; access to treatment and care and HIV prevention in Kibera informal settlement.

1.6.2 Specific Objectives

1. To determine the factors associated with uptake of HBTC in Kibera informal settlement.
2. To describe the experiences associated with couple and partner HIV testing and counseling in the HBTC program in Kibera informal settlement.
3. To determine the prevalence of the uptake and utilization of HIV preventive messages for behavior change among those who previously tested negative for HIV in Kibera informal settlement.

4. To explore the challenges associated with access and utilization of HIV care and treatment services by those who previously tested HIV positive in Kibera informal settlements.

CHAPTER TWO

LITERATURE REVIEW

2.1 History and epidemiology of HIV

The Human Immuno-deficiency virus (HIV) attacks and destroys the cells of the immune system, specifically the CD_4, cells, macrophages and dendritic cells causing Acquired Immunodeficiency Syndrome (AIDS). The condition is characterized by life threatening opportunistic infections (Coffin *et al*., 1986). HIV infection was first diagnosed among homosexuals in San Francisco in 1981 and spread rapidly causing many deaths and by 2005 it was estimated that about 33 m people were living with HIV worldwide. The UNAIDS report (2016) indicates that there are 38.3 m people living with HIV worldwide with an estimated 2.3m new infections and 1.6 deaths annually., About 1.6m infections and 1.2 m deaths occur in Sub Saharan Africa (UNAIDS, 2015).

HIV was first diagnosed in Kenya in 1984 and it is estimated that about 1.5m individuals have died due to AIDS related conditions resulting in about 1.8m orphans left behind (NACC, 2016). Although the prevalence of HIV has been stabilizing in Kenya since 2006, it is estimated that there are about 1.5m people living with HIV and Kenya is still contending with a severe epidemic with an estimated 35,000 AIDS related deaths occurring in 2015 (NACC, 2016). The concerted efforts in prevention mounted nationally from the year 2000 onwards, has seen the prevalence among pregnant women continue to drop with an extrapolated national adult prevalence falling from over 10% in the late 1990s to 6.7% in 2003 and to 6.3 in 2011 (UNAIDS, 2012). UNAIDS reports a total of 1.5 m people living with HIV (the majority 830,000 being women) in Kenya with approximately 56,000 deaths in 2015 down from 85,000 in 2006 (UNAIDS 2016). Though initially HIV was believed to be transmitted majorly among homosexuals, recent research shows higher transmission risk occurring in heterosexual relationships. In Kenya, Uganda, Rwanda and Zambia over 80% of HIV transmission occurs among

spouses or cohabiting heterosexual partners (Anand *et al*., 2009; Bunnell *et al.,* 2008; Dunkle *et al.,* 2008; Mermin *et al.,* 2008 and Gelmon *et al*., 2009). There seems to be various HIV epidemics in Kenya each with a set of driving factors (UNAIDS, 2016), however from epidemiological profile, Kenya has a generalized epidemic. There have been considerable gains made out of the concerted efforts of HIV prevention that have seen the prevalence drop from 7.1% (1.33 million people infected) reported by the Kenya AIDS Indicator Survey (KAIS, 2007) to 6.3% among Kenyans aged 15–64 years reported by Kenya Demographic health survey 2008-2009 (KNBS 2010) and to 5.6% by KAIS 2012, this being the most current population survey (the next population HIV survey is due in 2018).

Although Kenya has a generalized epidemic, there is significant variation in prevalence with factors such as age, sex, education levels, marital status and region. (KAIS, 2007; Gelmon *et al*., 2009). The HIV prevalence in urban women is higher (8.0%) compared to that of urban men at (5.1%) among the age group of 15-64 years (KAIS, 2012). There is notable distinction between men and women in respect to rural and urban dwelling, the women in the urban setting are at a more increased risk of infection (8 %) than women in the rural settings (6.2%). While the reverse was true of men in the urban areas at 3.7% compared to men in rural areas at 4.5% (KDHS, 2008-2009), in 2012 saw the opposite picture with a higher HIV prevalence (5.1%) among urban men compared to (3,9%) rural men (KAIS 2012).

While the prevalence is higher in women than in men, the situation is worse among young women 15-19 years who have a higher burden (6 times higher) than men of similar age group. In a modelling study involving Estimation and Projection package (EPP) and Spectrum in 2016, it was estimated that adolescents and young women contributed to 51% of HIV infections in Kenya (NACC 2016). The underlying causal factors being related to poverty, gender based sexual violence, gender inequality and stigma. Unprotected casual sex involving young girls and older men is a fundamental risk factor for HIV transmission in Kenya (UNAIDS, 2015). These risk factors are more

prominent in the high population density areas like the urban slums where unemployment and idleness among the youth is high.

Although HIV prevalence has remained stable in Kenya over the last 5 years, regional variations still persist with Nyanza region having the highest (Homabay 25%) prevalence and North Eastern Kenya with lowest prevalence of 1% (NACC, 2016)). All regions however have pockets of high prevalence in specific areas associated with urban settings with high population density like the urban slums and rapid population movement as well as the proximity to main transport routes and trading centers.

Variation in prevalence also occur in specific population groups including men who have sex with men (MSM) (9%); intravenous drug users (IDUs) 6%; fishing communities (17%), and sex workers having 25% of new infections (Gelmon *et al*., 2009). Women with slightly higher levels of education reported lower prevalence (6.2%) than the less educated ones 7.7-9.8% (KAIS, 2012).

When the epidemic was first recognized, the highest incidence rates were among the high risk groups; the mobile populations including long distance truck drivers, women sex workers and their clients. The trend has since changed with new infections occurring in the general population and the high risk groups alike with more women age 40-44 and men age 35-39 years most likely to be HIV positive (KDHS, 2008-2009). HIV prevalence is also higher in uncircumcised men (18.1 %) than circumcised men (4.5%) (Oluoch *et al*., 2011) and KAIS (2012) reported, 16.9% prevalence among uncircumcised men compared to (3.1%) in circumcised men.

Populations traditionally considered as low risk such as couples who are married or cohabiting or regular sexual partners have been shown to have the highest source of infection at 35 %. There is a 45% discordance rate among HIV infected married couples, with 10% of monogamous married couples and 14% of polygamous couples living with HIV (Kaiser *et al.*, 2011). HIV discordance is where one partner is HIV positive while

the other is HIV negative. HIV discordant couples are therefore a target in HIV prevention since there is a higher chance of HIV transmission to the partner who is negative especially where sexual intercourse is unprotected as there is low disclosure of HIV status to sexual partners. The burden of HIV is now greater in the younger age group 15-24 years who contributed 51% of adult new infections in 2015 in the country and targeted interventions are needed to combat the rising burden in this age group (NACC, 2016).

Consistent use of condoms in sexual relationships within partnerships is still sub-optimal with youth who had their first sexual encounter before age 15 years reporting condom use at 52.9% for women and 33.7% for men (KAIS, 2012). The low condom use calls for intensified HIV prevention education. Lack of knowledge of one's own or partner's HIV status is associated with a 50% to 66% decreased likelihood of condom use (Donnell *et al*., 2010). Increase in knowledge of HIV status encourages safer sex and is also an entry point for HIV care and treatment services. Increase in HIV testing and counseling (HTC) coverage is associated with reduction of denial, stigma and discrimination and increased mobilization of communities to respond to HIV epidemic (WHO, 2007). However in Kenya, 40% women and 48.9% of men who are sexually active reported no need for HIV testing because they perceived themselves to be at low risk of HIV infection (Cherutich *et al.,* 2012). This low risk perception is similar elsewhere, a study in France showed the majority of the sexually active heterosexual males accessed testing very late when the immune system was weakened remarkably but remained unaware of their HIV infection for long time (Delpiere *et al.,* 2007). The low risk perception is in itself a barrier to utilization of prevention messages and strategies and promote HIV transmission unknowingly to sexual partners.

2.2 Clinical Presentation of HIV infection

HIV infection can be broken down into four distinct stages and these stages reflect the destruction of the immune cells of the body, the T-helper cells that help fight disease.

Without treatment the process can ran over years (Stevens et al., 2012). Individuals infected develop illnesses that could previously be fought by the immune system. The symptoms increase in severity and number the longer the virus remains untreated.The signs and symptoms include fever, chills and night sweats, diarrhea, weight loss, coughing and shortness of breath, persistent tiredness, skin sores, blurred vision and headaches. As the disease progresses, the symptoms will be specific to the organ of the body affected. The World Health Organization classified the stages of HIV infection for ease in diagnosis and management into (i) primary infection also known as acute HIV infection, (ii) the clinically asymptomatic stage, (iii) the symptomatic stage and the (iv) fourth stage where there is progression to AIDS (WHO, 2006).

2.3 Diagnosis of HIV infection using Rapid test kits in Kenya

Research on the development of immunoassays for the detection of HIV antibodies have been in progress since the discovery of the virus (Pandori *et al.*, 2009). Simple rapid point of care HIV antibody tests are well established in voluntary counseling and testing centers (VCTs) globally and have become increasingly used in community settings (Taegtmeyer *et al*., 2006).

Rapid HIV testing is one of the components of the process of HIV testing and counseling. The process helps the individual to learn his HIV status and is helped to cope with the news of the diagnosis and is then linked to care and treatment services if diagnosed with HIV. Countries adopt their own algorithms of conducting testing either doing parallel testing where two rapid test kits are used simultaneously or serial testing where a second confirmatory test is done on the reactive sample.

In Kenya, HIV testing and counseling is done outside the laboratory mainly using serial testing algorithm on blood obtained by finger prick from the client. The first test has a high sensitivity whereas the second confirmatory test has high specificity. The process of HIV testing and counseling has evolved over the years to incorporate more innovative

strategies aimed at increasing access by individuals to HTC services. These strategies are briefly discussed below.

2.3.1 Client Initiated Counseling and testing for HIV (CITC)

In this approach, the individual goes out on their own to seek the HTC services. Counseling and testing services (as it was known then) started in Kenya as research programs to investigate feasibility and acceptance in the wake of very high stigma that surrounded HIV infection. People infected with the virus felt helpless as there were no drugs to help alleviate the suffering and imminent death. Stigma associated with HIV was high and there were a lot of concerns about the rights of the person and associated ethical concerns. Programs used anonymous code numbers to identify clients receiving counseling and testing services. HTC services have expanded to about 6000 sites in 2016 according to NASCOP (2016) from three sites in 1999. The services were given alongside massive HIV awareness creation campaigns. Clients seeking services from VCT sites do so out of a felt need and this service has been reported to be associated with increased risk reduction behavior mainly abstinence and condom use compared to Home based testing and counseling services (Mulogo *et al*., 2012). In 1994, Zidovudine was reported to reduce HIV transmission (Connor *et al.,* 1994) and this led to the expansion and enhancement of the provision and uptake of HIV testing and other models were introduced especially among pregnant women.

With the introduction of the antiretroviral drugs and the greater need to link clients diagnosed with HIV infection to care and treatment services, the anonymity and secret coding that was associated with testing changed to name based, to facilitate this referral and linkage to care and treatment and follow up (NASCOP, 2008). The limitation of VCT approach is that it only reached those who sought the services on their own and therefore did not reach the majority of the population.

2.3.2 HIV testing in Ante-natal clinics

Testing in ante-natal clinics happens under the national Prevention af mother to child transmission of HIV (PMTCT) program that was launched in Kenya in 2002 following the completion of a pilot in 4 sites from the year 2000. Pregnant women attending ante-natal care services are offered HIV testing and counseling services unless they decline to take the service termed "opt out" approach. The service has now become the standard package of care in all ante-natal care settings in government facilities where the services have been integrated reaching of up to 95 % of pregnant women in Kenya accessing ante-natal care (KDHS, 2014). This was in line with the UNGASS goal (UNAIDS, 2010) to reduce the proportion of infants infected with HIV by 20% by the year 2005 and by 50% by the year 2010 (MOH, 2009). In the absence of PMTCT services, resource poor countries like Kenya would have HIV transmission rate of 40% from breastfeeding mothers to their infants.

Initially many concerns were raised about confidentiality in relation to referral to care and access to appropriate services as well as stigma and discrimination (Gruskin *et al*., 2008). However systemic review of published literature has shown that adoption of provider initiated testing and counseling (PITC) within ANC settings is acceptable to the attendees and facilitates progress towards universal voluntary testing of pregnant women as well as promoting access to treatment (Hensen *et al*., 2012). Women diagnosed with HIV are offered ART prophylaxis that dramatically reduce perinatal transmission of HIV to the baby (Sperling et *al*., 1996). Kenya has adopted more efficacious regimens of ARVs and the Option B plus where the HIV infected pregnant woman is started on ARVs treatment immediately diagnosed and to continue taking these for life (MOH, 2012).

The challenge in coverage of PMTC is however the lack of access to ANC services by some pregnant women (Sasaki *et al.*; 2010), where many pregnant women do not attend ante-natal care clinics. Additionally the health systems challenges as well as community

level factors are still a hindrance to uptake of antiretroviral drugs among HIV infected pregnant women (Gourlay *et al.,* 2013).

2.3.3 Diagnostic Testing and Counseling

In 2005, the Kenya HIV program introduced Diagnostic Testing and counseling in clinical settings following recommendations from WHO (WHO, 2005), to aid in the management of clients who presented with signs and symptoms linked to HIV and AIDS. Diagnostic Counseling and testing refers to HIV testing within clinical settings to aid in patient care management (Obermeyer *et al.,* 2007). A client presenting with symptoms suspected to be linked to HIV was tested for HIV for purposes of diagnosis. This covered the most vulnerable groups; sick children and clients with known or suspected tuberculosis infection (TB) among others. While in the first instance in VCT, the client got to know his HIV status, in this instance the prerogative of disclosing the HIV status to the client/patient was entirely left to the attending clinician and often a client did not get to know his/her HIV status (Obermeyer *et al.,* 2007). This was later adopted and modified by WHO, who provided guidelines for Provider initiated Testing and Counseling for a wider coverage with services and promote knowledge of HIV status (WHO, 2007)

2.3.4 Provider Initiated Testing and Counseling (PITC)

In 2007, WHO released new guidelines on Provider initiated Counseling and testing in a bid to expand coverage of testing services and to minimize missed opportunities so that people can be put on the then increasingly becoming available treatment with Anti-retroviral drugs (ARVs) (WHO, 2007). Kenya adopted these guidelines and further recommended that because the epidemic is generalized; where there is an enabling environment and adequate resources are available, health care workers should recommend HTC to all clients attending health facilities regardless of the reason for the visit (NASCOP, 2008). The settings included medical and surgical services, public and

private facilities, inpatient and outpatient settings and mobile or outreach medical services.

The guidelines further recommended the testing of all individuals visiting the patient in the health facility including their spouses, family members, children, parents and friends (NASCOP 2008). Remarkable success has been obtained by this approach. Thus PITC requires all health workers and providers who come into contact with clients to offer and provide all clients with testing and counseling services unless the client categorically declines to take up services a concept referred to as "opt out" (WHO, 2007, Bassett *et al*., 2010). In areas where this has been implemented, program data shows acceptance and uptake of over 90% as it reduces stigma and discrimination which at the time was well documented (Weiser *et al*., 2006).

The strategy is cost effective in terms of diagnosing new clients who if linked appropriately to ART services yields substantial benefits of survival (Walensky *et al.*, 2007). A study in Uganda also showed that PITC is associated with high HIV diagnosis but reduction in risky sexual behavior was only modest (Kiene et *al*., 2010). In a study in western Kenya, PITC was found to be the strategy that yielded the highest proportion of people testing HIV positive (Wachira *et al.*, 2012). The challenge with PITC is that the majority of the population is well and would not necessarily visit health facilities.

However service provision challenges have been reported with health workers expressing the challenges in seeking consent in a routinized patient care situation, maintaining confidentiality, time constraints versus workload and space limitations in health facilities (Evans and Ndirangu 2011). These challenges have contributed to negative attitude by health workers towards PITC and client coverage has remained low (Ntuli *et a*l., 2011).

The expansion and diversification of testing and counseling approaches yielded remarkable improvement over a 5 year period with 72% of Kenyans having tested for

HIV and 46% know their correct HIV status up from 16% in 2007 (KAIS, 2012). The testing coverage as reported by KDHS, a population survey in Kenya is 83% women and 71% men have ever tested for HIV (KNBS, 2014). The lack of uptake of testing and counseling services by some individuals in the country occur despite having several VCT centers and the diverse approaches as outlined above. Reasons for the low access to VCT services include perceived stigma and fear in being seen going to a testing center and risk of being labeled HIV positive; cost and time spent on going to the VCT center; and poor community mobilization and of course low risk perception of HIV vulnerability persist (Nganga *et al.,* 2014). This called for diversification of strategies of delivering HIV testing and counseling using more innovative strategies to deliver services to Kenyans to reach the universal access goal for 80% of Kenyans knowing their HV status.

2.3.5 Expansion of Access to Testing and Counseling: Community based approaches

.With increased evidence from other countries and with the evidence from the Kenya AIDS indicator survey (KAIS, 2007) more innovative approaches to increase access to testing and counseling for the populations by taking the services to them were introduced. Community based testing and counseling includes all the approaches which are offered outside health facilities and designated testing centers. These include outreach, workplace and home based services (NASCOP, 2008).

2.3.6 Workplace and outreach HIV testing and counseling services.

HIV testing and counseling services are taken to the workers at the place of work. In this approach, programs work with top management of a given organization to create demand for HIV services in them. This creates a conducive environment for the employees to want to take up services. In a study in Zimbabwe, comparing the service uptake in two approaches of work place where in one arm clients were given vouchers to

access VCT offsite and in another arm, the services were offered on site and linked to basic HIV care; the latter was found to be more effective (Cobbett *et al.,* 2006).

Outreach services (also known as mobile HTC) target the hard to reach populations and all manner of means are used like riding on camels' back to access the pastoralists as it happens in North eastern Kenya; moonlight services to reach the long distance truck drivers and commercial sex workers, and use of tents and existing community facilities such as schools and churches and market buildings to offer services to the general population as they go about their daily activities.

2.3.7 Evidence based practices on Home based testing and counseling

The introduction and use of innovative approaches to increase the uptake of testing and counseling by taking services to the people through Home based testing and couseling follows evidence that this approach can be effective and are successful (Marks *et al*., 2007). The approach mitigates some of the barriers like distance, lack of financial resources stigma (fear of being seen when going for services) and low risk perception that hinder clients from accessing services (Mills *et al.,* 2012*).* A qualified and certified service provider visits the home or house of a client and with the client's consent offers him testing and counseling services (NASCOP). 2008

Studies in Malawi and Uganda where the HIV and AIDS disease burden is more or less like the Kenyan situation have shown that home based testing and counseling is highly acceptable to clients and is a successful strategy in reaching those who have not tested for HIV (Bateganya *et al.,* 2009; Menzies *et al*., 2008). In Uganda, HBTC was employed successfully in Rakai and Bushenyi districts, where acceptance was over 90% among 350,000 people who were offered the test at home (Matovu *et al.*,2007). In a study to determine the factors influencing uptake of VCT in Bushenyi district in Uganda, it was found that increased mobilization, reduction in costs, and linkage to care and provision of high quality services increased the number of people seeking testing services

(Nuwaha *et al*., 2010). In an evaluation of the cost effectiveness of four approaches; stand alone, provider initiated counseling and testing in health facilities (PITC), workplace and home based testing and counseling was evaluated, home based testing and counseling was found to be the second cheapest after the health facility (PITC) approach (Menzies *et al*., 2009).

Home based testing and counseling has several advantages; there is no cost to the client in terms of travel and stress, the client if married receives services with the spouse thus addressing issues of prevention if there is discordance, promoting acceptance and support (Bateganya *et al*., 2009). In addition, there is opportunity for the whole family to be tested together, which promotes disclosure and garners the much needed support within the family for prevention, care, treatment (Weidle *et al.*, 2006; Were *et al.*, 2006).

A study in Rwanda and Zambia showed that most infections occurred among the married or cohabiting couples (Dunkle et al., 2008). Equally in Kenya, heterosexual sex within unions or regular partnerships account for 44.1% of new infections (Gelmon et al., 2009). These are trusted relationships and therefore no form of protection is used during sexual intercourse. HBTC offers an opportunity for couples and families to access HTC services together thus promoting disclosure and support for treatment and care (Bunnell *et al*., 2008).

The Kenya AIDS Indicator Survey (KAIS, 2012) demonstrated that HIV discordance (where one partner is HIV positive and the other HIV negative) is about 45% among married and cohabiting couples who were positive. These findings called for a strategy targeting couples with services of HIV testing and counseling in order to diagnose HIV discordance and offer prevention services to avoid spousal and partner infection. A comparative study in rural Uganda found that clients of HBTC were more likely to report disclosure and faithfulness than clients from facility VCT (Mulogo *et al.*, 2012). Low HIV risk perception has improved from 67% in 2007 to 47% (KAIS, 2012).

2.4 Laboratory Diagnosis of HIV

HIV Diagnostic technologies for HIV have improved over the years from the 1st generation technology using recombinant HIV protein to second generation technology which employs the same technology but uses synthetic peptides (Deskalakis, 2011). The technologies detect the binding capacity of the antibody IgG to the antigen coated wall. The 3rd generation technology is an improvement which uses two antibodies IgG and IgM. This has the advantage that the antibody responses are detected earlier than 1st and 2nd generation tests. While the window period is narrowed, they cannot detect acute infection necessitating the use of RNA based detection methods which are very expensive and labour intensive to perform and take a long time for results to be ready and therefore not useful in prevention efforts (Fiscus *et al*., 2007; Patel *et al*., 2006; Pilcher *et al*., 2005).

HIV-RNA testing detects HIV infection in individuals in acute infection phase who would otherwise be missed with antibody tests and who would continue transmitting the virus unknowingly when they are most highly infectious (Pragna *et al*., 2006). HIV-RNA testing is also valuable in the quantification of the virus and is useful in the monitoring of treatment success. The fourth generation standard immunoassays combine both antibody and antigen and are easy to perform, relatively inexpensive and automated. (Pandori *et al*., 2009). The HIV Combo assay (fourth generation) was able to detect 89.5% of the of HIV infections that had been missed by the first generation technology and 85% of those missed by the 3rd generation technology (Pandori *et al.*, 2009)

In developed countries pooled Nucleic acid amplification testing (NAAT) is used to increase the HIV case detection (Patel *et al.*, 2010). Individuals with acute infection have a higher chance of HIV transmission than those patients with chronic infection because of the elevated viral load. Evidence suggests that these individuals with acute infection contribute disproportionately to the HIV epidemic (Pinkerton 2008; Pilcher *et*

al., 2004; Wawer *et al*., 2005). It is suggested that the estimated 25% of individuals unaware of their HIV infection are responsible for 54% of new infections (Marks et *al*., 2009). Identification of these highly contagious individuals via p24 antigen detection during the acute phase of infection affords the opportunity of reducing the viral load with antiretroviral medications, as well as initiating behavioral modification. There are newer rapid test kits in the market capable of detecting both the antigen and antibody however these are still out of reach in sub Saharan Africa.

HIV/ DNA /PCR testing has revolutionized testing for HIV in blood safety and early infant diagnosis (EID) programs. HIV DNA PCR is sensitive as early as 10 days post infection, thus reduces the window period remarkably (Pandori *et al*., 2009).

2.5 Management of HIV and AIDS

The management of HIV and AIDS has two prongs; 1) treatment for HIV and 2) prevention of HIV transmission and infection. The success of HIV and AIDS management relies on the early diagnosis, linkage, access and adherence to treatment. Testing and counseling protocols include linkage of the individual diagnosed with HIV to access to care and treatment and provision of HIV prevention messages for the uninfected individual (NASCOP, 2010). Initially, WHO guidelines recommended the initiation of ART in individuals with CD_4 levels equal to or less than 250 cells per microliter, this has sice moved to 350cells per microliter then to 500 cells per cubic millimeter (WHO, 2012). CD_4 count served as the most important marker of the degree of immune-suppression in individuals with HIV. WHO clinical staging criteria was also recommended as a marker of initiation of therapy with WHO stage 3 (advanced symptoms) and 4 (severe symptoms,) being an indicator for initiation of therapy regardless of CD_4 cell count. New treatment guidelines both from WHO (2015) and in Kenya (NASCOP, 2016) have surpassed all the above guidelines and it is recommended that all individuals testing HIV positive are commenced on ARV immediately or as soon as it is feasible with no reference to CD_4 or WHO staging. Viral load determination is

now used as a marker for monitoring treatment failure done routinely after 6 months of treatment initiation, then next after 12 months and annually thereafter.

2.5.1 Treatment for HIV infection.

A successful testing and counseling programme incorporates effective referral and linkage of those diagnosed with HIV infection to care and treatment services. To date there is no cure for HIV and management of the infection comprises the use of prophylaxis against opportunistic infections and use of highly active antiretroviral therapy (HAART). The anti-retroviral drugs suppress the multiplication of the virus in the human body thus allowing the immune system to regenerate and the individual becomes stronger again.

The use of ART is optimal when integrated with prevention measures. Studies suggest that individuals on ART only showed decline in risky sexual behavior in the first 6 months of ART initiation and that the percentage of those engaged in risky sexual behavior doubled at 36 months (Apondi *et al.,* 2011; Bunnell *et al*., 2006) suggesting the need for continued education, counseling and support. A three year follow up study in Uganda showed an improved quality of life, decrease in depression and increase in sexual activity among those taking ARVs (Bunnell, 2008). There are 4 classes of antiretroviral drugs currently in use in Kenya; Nucleoside/Nucleotide Analogue Reverse Transcriptase Inhibitors (NRTI), the Non-Nucleoside analogue Transcriptase Inhibitors (NNRTI), the Protease inhibitors (PIs) and the Integrase inhibitors. Each of these classes of ARVs act at different stages of the viral development in the human cell. Early diagnosis and initiation of therapy when the immune system is still strong is associated with better treatment outcomes and allows the immune system to recover, reducing the incidence of opportunistic infections (Bartlett *et al*., 2013).

The CD_4 T cells level at which HAART should be initiated remained an unresolved issue for a long time. The lower the CD_4 T cells count, the poorer the outcome (Bassett

et al., 2010). Data from 18 cohort studies showed that clients in whom HAART was initiated at CD_4 count of between 250 -350 cells per microliter were associated with high rates of morbidity and mortality (Sterne *et al*., 2009). In the Gambia, mortality was associated with CD_4 of less than 100cells per microliter. Thus the current World Health Organization (WHO) and Kenyan ART guidance is to initiate ART immediately upon HIV diagnosis regardless of the CD_4 count or WHO staging (NASCOP, 2016).

The standard first line treatment with ARVs in Kenya for adults is a fixed daily dose combination of three drugs in line with WHO recommendations: Tenofovir (TDF) + Lamivudine (3TC) + Efavirenz (EFV) and alternative regimen of Zidovudine (AZT) + Lamivudine 3TC) + and Nevirapine (NVP) or Efavirenz (MOH, 2012, Bartlett *et al*., 2013). Initiation of ART is preceded by patient preparation which includes; physical assessment, laboratory evaluation and evaluation of patient readiness including willingness to disclose the HIV status to at least one treatment supporter (NASCOP, 2012).

A major obstacle in achieving universal access to ART is loss to follow up between diagnosis of HIV and initiation of ART (Shahstri *et al*., 2013). Studies have shown that one third of patients diagnosed with HIV did not reach the health facility (Honge *et al*., 2013; Togun *et al*., 2011; Shastri *et al*., 2013). One of the major reasons that hinder clients from accessing ART facility earlier is because of the requirement (during the preparation phase) to disclose their HIV status to a treatment partner (Togun *et al.*, 2011). Denial of HIV status is associated with delayed access to treatment services after diagnosis and use of alternative healers (Wringe *et al*., 2009) as is stigma which has been identified as a strong barrier to access to treatment services (Van Tam *et al*., 2011). WHO clinical stage 3 and 4 were also found to be associated with loss to follow up due to death of the client before accessing the health facility (Togun *et al*., 2011).

Transport cost, distance and staff shortages with resultant long waiting time in facilities was identified as the major barrier to access of treatment services in a study in South

Africa (Govindasamy *et al.,* 2012). Additional barriers that have been identified include lack of communication and information about ART, rushed consultation time and lack of follow up counseling and lack of confidentiality in treatment centers (Sonjobo *et al.,* 2008). Adherence is central to the success of ART once initiated and therefore continued counseling and support is necessary (Bartlett *et al*., 2013).

2.6 HIV Prevention interventions

Prevention messages are delivered to the general public through the mass media using electronic, print and on one on one basis to those accessing testing and counseling services. The prevention messages include: knowledge of self and sexual partner's HIV status, consistent and correct condom use, disclosure of HIV status to sexual partners, reduction in number of sexual partners, limiting sex with one partner who is HIV uninfected, treatment of STIs and in addition, treatment with ARVs for the individual who is HIV infected. A systemic review of 68 studies in Sub Saharan Africa showed multiple sex partners, paid sex and presence of STI as high risk factors for HIV transmission (Chen *et al*., 2007). Circumcision is associated with reduced transmission of HIV (Cohen *et al*., 2011). There is reported higher prevalence of HIV (18.1%) among uncircumcised men compared to circumcised men (4.5%) and STIs infection carries a two-fold risk of HIV infection (Oluoch *et al.,* 2011).

Meta- analysis findings showed that the woman was the index client in about 47% cases (Eyawo *et al.,* 2010) in HIV discordance. In Kenya HIV discordance among married and cohabiting HIV infected couples is 45% (KAIS, 2012). Knowledge of HIV infection status among married and cohabiting couples in Kenya is low (14.9%) and use of protection among couples is also low even among the HIV discordant couples (Kaiser *et al*., 2011) thus increasing the risk of HIV transmission to unsuspecting partners. This calls for the strengthening of HIV prevention messages delivery. Substantial evidence exists on the benefits of couple HTC among the HIV prevention strategies. HIV infected

persons who are aware of their HIV status are more likely to use condoms (Potter *et al.*, 2009).

A study in Uganda demonstrated that provision of integrated ART, prevention counseling and partner testing was associated with reduction of risky sexual behavior among those who were HIV infected (Bunnell *et al*., 2006). Home based testing and counseling has been found to promote faithfulness and disclosure as it offers the opportunity for partners to be tested and counseled together for mutual disclosure and support (Mulogo *et al.*, 2012).

2.7 Use of Psychosocial Models in HIV prevention programs

2.7.1 Community Participation

Community participation can be defined broadly as involving the people in a community project and development of services geared towards solving their own problems (Tarragon *et al.,* 2010). Community involvement is more effective when individuals are given specific tasks and take part in decision making and service delivery (WHO, 2013). Four key processes have been identified as effective in gaining community participation in HIV risk reduction interventions (Galbraith *et al.,* 1996). The processes include: a) defining and reaching the community; b) recognizing tensions among research, service and community participation; c) involvement of residents; d) consideration of cultural differences (Cook *et al*., 1988).

Successful public health programs have embraced community participation and psychosocial models in helping communities change and adopt better strategies in dealing with health challenges (Saheb and Nobaya 2010**)**. Home based testing and counseling for HIV is basically a community service and acceptance by individuals would be influenced by how the community views their risk to HIV and how the community views the service being offered.

2.7.2 Health Belief Model

A number of psychological theories have been used to predict, explain and influence health behavior. The social cognitive theories are based on beliefs and attitudes as proximal determinants of health behavior as these often do change for example by provision of relevant information as is the fundamental premise of HBTC. Health behavior can be defined as behavior that influences or is believed to influence physical health outcomes either by increasing or decreasing the risk of severity of the threat (Rosenstock, 1974). The Health belief model (HBM) a social cognitive model was developed in 1950 by a group of psychologists working in public health who sought to explain why some people do not use health services such as immunization and screening for various diseases (Hardeman *et al*., 2005). The same can be applied to explain why people would or would not take up HIV preventive services. The Health Belief model has four constructs (Rosenstack, 1974); firstly; perceived vulnerability or risk and the associated question is; "do the people consider themselves susceptible to HIV?" In Kenya, KAIS (2012) found a very low HIV risk perception among Kenyans (KAIS, 2012). Perception can be changed by provision of knowledge to the community.

Effective health education processes can be applied to increase the community's perception of risk. Secondly, there is the construct of perceived severity which addresses the question; do people perceive contracting HIV as having serious consequences? Perceived vulnerability to HIV related illnesses was found to be an important factor influencing clinic attendance in rural Tanzania (Wringe *at al.,* 2009). Provision of education in simple terms and language, reaching the vulnerable people, dispelling myths and rumors would go a long way to helping the community understand better. The third construct is perceived benefits if behavior is modified including the reduction or increase in severity. Provision of knowledge about the available interventions that help reduce the impact of HIV on the individual, for example that ARVs are available at no cost and that if taken properly, improve the health of the individual by viral suppression and thus one leads a near normal life. Lastly perceived barriers including costs and

disadvantages of adopting new behavior or alternative course of action. Of all the four constructs, perceived barriers is the most significant and consistent predictor of behavior and severity is the least consistent (Harrison *et al.,* 1992). Seeking HIV testing and counseling is still marred by stigma (Gilbert & Walker, 2010) and one feels that if they are seen going for services then this will be interpreted as being immoral or "nearly dying" (Curran *et al*., 2013). People cite cost in terms of time and distance and being busy (Govindasamy *et al*., 2012; Talam *et al*., 2008; Nakigozi *et al.,* 2013) as barriers to seeking services, more so because of low HIV risk perception. These barriers have been shown to be lessened by taking services to the homes of individuals and actively involving them in the process of service delivery.

2.7.3 Package of services for home based testing and counseling in Kibera 2009-2011

The Kibera HBTC program carried out from 2009 – 2011 used the psychosocial models of community participation and health belief described above to create demand and increase access to HTC services with success. The testing uptake was 97.7 % and achieved household coverage of 95%. In addition to the opportunity offered to individuals to learn their HIV status, the package of services in HBTC (NASCOP 2010) includes education on HIV prevention strategies to all who access the services in order to promote knowledge and reduce HIV high risk behaviors. The prevention messages include promotion of knowledge of sexual partner HIV status, promotion of partner HIV testing, promotion of consistent and correct condom use accompanied by condom use demonstration to the individual, reduction of sexual partners and limiting to one of known HIV status, promotion of access to prevention of mother to child transmission (PMTCT) of HIV services for pregnant women, messages about voluntary male medical circumcision (VMMC) for uncircumcised men, treatment of sexually transmitted infections (STIs) and referral for immediate access to care and treatment services for those diagnosed with HIV.

Individuals diagnosed with HIV were counseled on the need and encouraged on immediate access to care and treatment which was available free of charge in the country. The client was given an option to choose the preferred clinic they wished to attend from a listing of all the comprehensive care clinics in the neighborhood. A referral note was given to the client to present at the clinic on the day of the visit.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study design

This was a cross sectional study combining both quantitative and qualitative data collection methods. This approach was chosen because the challenges of HIV service uptake are complex and to a large extent shaped by societal inclinations which can best be elicited by qualitative methods. Qualitative data was obtained to supplement the quantitative information thus increasing understanding of trends, patterns of behavior, perceptions and beliefs and utilization of HIVservices. HIV testing services were offered to individuals who reported HIV negative status based on previous HIV test result

3.2 Study Area

The study was carried out in Kibera informal settlements situated in the southern part of Nairobi City, Nairobi County, about 12 km from the central business district in the Republic of Kenya occupying an area of 1.8 sq. km (Figure 3.1). It is divided into 13 distinct administrative villages each headed by a chief and there are also village elders and gate-keepers who form an important element in the village entry process and determine the acceptance and uptake of any services provided to the community. There is only one public health facility in Kibera despite the reported population of 105,945 persons (KNBS, 2009). However there are numerous non-governmental organizations offering free health services including those that offer free HIV services with four of them offering anti-retroviral therapy. One of the organizations also offers free nutritional supplements and other incentives to those that are infected with HIV. There are also many privately individual owned health clinics that charge for services offered. The reported HIV prevalence is above the national prevalence at 8%.

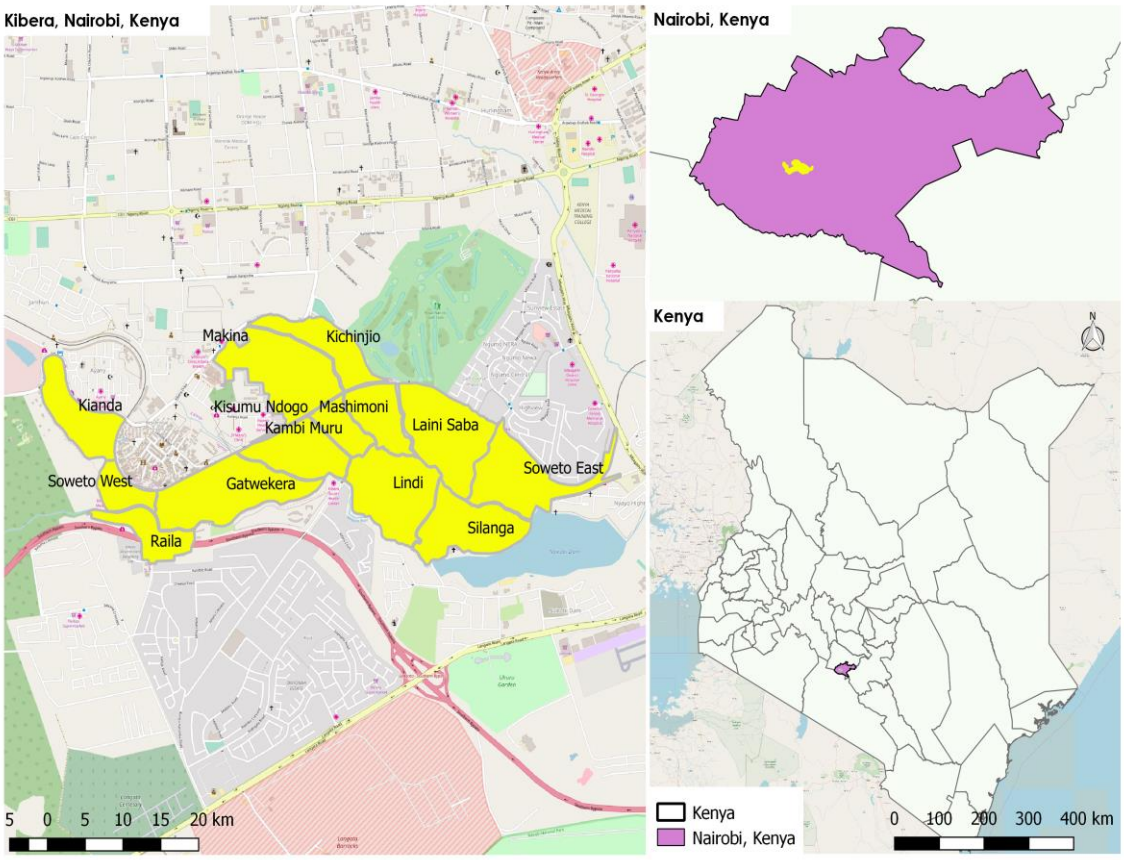

Figure 3.1: Map of Kenya showing Nairobi city with Kibera slums

(Source: Kibera maps)

3.3 Study Population

The study population composed of the residents of Kibera informal settlement with an adult population of 105,945 persons (KNBS, 2009). They comprise of all the indigenous ethnic groups in Kenya and specific village residency is largely influenced by ethnic and religious inclination. According to the latest Kenyan population census (KNBS 2009); priority challenges and their attributes in Kibera can be classified as follows: there is poverty with low average income (US $ 20/month) and high rate of unemployment

levels among young adults. The many adults and young people who are unemployed are idle and often engage in high HIV risk behaviors like high alcohol consumption, prostitution, child labour and petty offences. Low levels of education exist with 33% having primary education and only 14% with some secondary school education. It has low school enrolment among children and large contribution to street children pool in Nairobi city.. Several traditional healers and herbalists sign posts for sale of herbal medicine can be seen in the slum. It is presumed that all the above factors influence health seeking behaviors of the residents.

3.3.1 Inclusion Criteria

1. Consenting adults over 18 years of age
2. "Emancipated" minors (mature minors 13-17 years old - people below 18 years but either married, pregnant or living with a consensual sexual partner (NASCOP, 2010)
3. Residents of Kibera since the year 2009
4. Mentally stable individuals who can give informed consent for participation

3.3.2 Exclusion Criteria

1. Adults and mature minors who did not consent to participate in the study were excluded from the study.
2. Non residents of Kibera informal settlement
3. Participants who reported being HIV positive and showed evidence of enrolment to treatment and care services were interviewed but not offered the HIV test.
4. Mentally unstable individuals who cannot give informed consent for participation

3.3.3 Assumptions

The following assumptions were made:

1. There would be adequate number of people who had participated in HBTC previously.
2. Participants would accept to be interviewed and those who previously tested negative for HIV will accept to be offered HIV testing.

3.4 Sample size determination

The sample was estimated within 95% confidence interval with 5% of difference using Fisher's sample size calculation formula for cross sectional study designs (Fisher *et al., 1998).* The sample size calculation was based on the proportion of the Kenyan population (48**%)** who reported having been tested for HIV and those who had not been tested for HIV (52%) country wide according to Kenya Demographic health survey (KDHS) (KNBS, 2009).

Thus the sample size was calculated using the formula below:

$$n = \frac{Z^2_{1-\alpha/2} P(1-P)}{d^2} xDEFF$$

Where;

n = the sample size

α = Level of significance (0.05)

$Z_{1-\alpha/2}$ = Normal standard deviation with 95% Confidence Interval taken as 1.96

P= the proportion of Kenyans who know their HIV status = 48%

d= the absolute precision (margin of error) taken as 5%

DEFF= Design effect due to clustering taken as 2

The sample size is thus

$n= 2 \times 1.96^2 \times 0.48 \times 0.52/0.05^2$

n = 766

Allow provision for 20% for refusals and people not found in their houses at first visit = 153

Sample size (adjusted n) = n + refusals and absent =766+153= 919

N taken as =920

Using the area map and the existing 11 administrative villages, three villages were purposefully selected based on our knowledge of village occupation in Kibera along ethnic lines. These villages offered representativeness of all ethnic groups in Kibera, to eliminate ethnic bias which might influence the findings. Using the WHO modified compact segment sampling (Milligan *et al.,* 2004), the number apportioned in each village was determined by calculating the probability proportional to the the predetermined population size of each village. One segment was chosen at random and all households in that segment were included in the sample (structurally each village is divided into clusters and within the clusters are structures enclosing several households). This method allows for calling back if a client is not found at home and also removes subjectivity and bias of choosing whom to recruit onto the study (Milligan *et al.,* 2004). Distribution of the sample per village was done proportionally to the population of the particular village as illustrated below (Table 3.1).

Table 3.1: Distribution of sample size per village

Village and Population	**Number of participants calculated in proportion to the population of the village**
Raila – 4961	225 (24.425%)
Kianda – 7766	352 (38.235. %)
Kisumu Ndogo – 7584	343 (37. 335%)
Total all villages 20311	**920 (100%)**

3.5 Data collection tools and procedures

3.5.1 Quantitative Data

Inorder to assess the factors associated with uptake of HTC, couple testing and delivery of prevention messages, data was collected by face to face interviews using semi-structured questionnaire for each participant (Appendix 1). The interviewers obtained demographic data, history of previous testing and counseling, experiences with HBTC, provision of prevention messages at the time of last HBTC, their utilization and behavior. Data was also collected on couples testing and counseling, challenges associated with uptake of referral services to treatment and care services and on utilization of HIV preventive counseling messages received by those previously tested for HIV. HIV testing was performed among the consenting participants who reported being HIV negative and those who had not tested before for HIV.

3.5.2 Procedure for HIV Testing and Counseling services.

Research assistants approached participantse systematically in their households, obtained their consent to participate in the study and proceeded to conduct the interview and offer HIV testing and counseling as appropriate ensuring privacy. HIV

testing was done by NASCOP certified HIV Voluntary Testing and Counseling (HTC) service providers following the national guidelines on rapid HIV testing (NASCOP 2008). The approved national testing algorithm of rapid test kits comprising of Determine^{TM} (Abbott Laboratories Lake Bluff, Illinois, USA) as the first test and confirmation for those reacting positive was done using Uni-gold (Trinity Biotech PLC, Bray, Ireland). In each session clients received behavioral interventions that included HIV risk assessment, and based on the outcome of the test whether positive or negative results, education was given on appropriate HIV prevention strategies.

The HIV prevention strategies discussed included abstinence for those not married, need to have sexual partners tested for HIV and condom use, education about ART and referral to ART services for those who tested HIV positive. Condom use demonstration was done and free condoms offered to clients who were sexually active.

Post-test counseling was given to all participants who received the HIV test. Clients testing HIV positive were referred to treatment and care centers and those testing negative were given HIV prevention counseling and education and also had appropriate referrals to other services as determined from the counseling process as per the national guidelines (NASCOP 2010).

3.5.3 Qualitative Data

Qualitative method was used to collect information about (i) utilization of HIV prevention messages, (ii) experiences with couple testing and (iii) counseling and challenges associated with utilization and access to care and treatment services. Six focus group discussions (FGD) were conducted using a discussion guide prepared for this purpose (Appendix 2). Two focus group discussions were conducted from each village by age category of those aged between 18 years and 30 years and those aged above 30 years. This categorization was based on data obtained from the quantitative interviews and recommendations by the participants on appropriate age mix and

clustering for free and open group discussions. The distribution of participants per focus group discussion by village is shown on Table 3.2.

The focus group discussions were preceded by two sessions of training of the note takers on the conduct of focus group discussions and note taking. Each participant signed informed consent form for participantion in the FGD. Each FGD comprised of both males and females and numbered between 6-9 individuals and lasted between one and a half hours to two hours. All the FGDs were moderated by the principal investigator and there were two note takers per FGD session. A tape recorder was used to compliment the note taking exercise. Collective verbal consent was also obtained from the participants for use of the tape recorder.

The FGDs explored the following factors; (i) knowledge and experiences with HIV testing and counseling services at individual level and as couples, (ii) provider interaction and messages provided by service providers during the previous HBTC, (iii) satisfaction with the services, (iv) benefits of HTC and where to obtain services, (v) views on challenges and vi) actual uptake of treatment services and (vii) views about utilization of prevention messages for behavior change including consistent condom use, disclosure of HIV status to sexual partner, viii) sexual partners reduction, (ix) partner testing, (x) treatment of STIs and (xi) access to VMMC , PMTCT and Family planning (FP) services.

Table 3.2: Distribution of participants per focus group discussion by village

Village	Female	Male	Total
Raila			
18-30 years	4	3	7
31-50 years	3	3	6
Kianda			
18-30 years	3	6	9
31-50 years	3	5	8
Kisumu Ndogo			
18-30 years	3	5	8
31-50 years	5	3	8
Total	**21**	**25**	**46**

3.6 Data management

Quantitative data was collected onto scanable paper-based forms (Appendix 1). These tools were piloted and revised before the survey to ensure their appropriateness and that all counsellors had been trained and given consistent directions on how to ask the questions.

To ensure data quality, the field supervisors reviewed data collection forms for accuracy, completeness, at the end of each day and before sending them to the data office. The forms were scanned using Teleform version 9.1 (Optiform, Pennsylvania. INC. USA). After the scanning, the data was verified and exported to a MS access database after which data cleaning was done. Records with missing information/incomplete information/outlier information were examined and necessary changes effected where

necessary. In ensuring data security, the database access was password protected and only accessible to the data manager. The paper forms were stored in cabinets under lock and key away from the field.

3.6.1 Quantitative data analysis

Quantitative data analysis was done using STATA 13.0 (STATA Corp. 2013 College Station, TX). Scio-demographic data were described and analysed using descriptive statistics. Chi-square test was used to determine association and variables with a p-value <0.1 were candidates for the multiple logistic regression model.

To determine the prevalence of the uptake and utilization of HIV prevention messages, a composite prevention message provision index was constructed using multiple correspondence analysis (MCA). The components considered, and demarcated as yes/no, included the following: Message about condom use given in HBTC; Message about Partner reduction given in HBTC; Message about Faithfulness given in HBTC; Message about VMMC given in HBTC; Message about STI treatment given in HBTC; Message about family planning given in HBCT; and Message about treatment enrolment given in HBTC. STATA 13 (Stata Corp, 2013). The composite index score for each respondent was calculated from the generated weights, and included as a predictor in the models. This was used to rank respondents into tertiles with the first, second and third tertiles representing low, medium and high HBTC provision/receipt, respectively.

Behaviour change index was created using sing MCA, based on responses (yes/no) to the following questions: Since learning HIV status used protected sex; and since learning HIV status reduced number of sexual partners. The resulting behavior change index was a dichotomous variable taking a value 1 if the respondent had a positive change in behavior (adopting safer sex practices) and 0 if not.

Bivariate cross tabulations were carried out and behavior change rates were calculated for each category of the covariates (Sex; Age category; Occupation; Education; Marital status; Employed; Had sex with regular partner in the last 3 months; Had sex with casual partner in the last 3 months; Is/Are partner(s) new?; Tested in HBTC previously; Tested in Kibera HBTC previously; How would you rate the HBTC experience?; and HBTC provision index). Pearson's Chi-square statistic was used to test for bivariate association between the outcomes of interest and the covariates identified. Bivariate cross tabulation was carried out to assess the association between the prevention message provision index and selected covariates. Logistic regression analysis was carried out using the logit command in STATA 13 with the behavior change index as the outcome of interest and the predictors considered significant ($p<0.1$) during the bivariate analysis.

3.6.2 Qualitative Analysis

To describe the experiences associated with (i) couple testing and counseling, (ii) utilization of prevention messages and (iii) to identify challenges associated with access and utilization of care and treatment services by those who previously tested HIV positive, thematic content analysis was done after coding the data using priori code list (Burnard *et al.*, 2008.. The themes included (i) knowledge of HIV testing and counseling, (ii) experiences with HIV testing and counseling, (iii) messages given at HBTC, (iv) benefits of HIV testing and HBTC, (v) utilization of prevention messages provided and (6) views about access to care and treatment services.Atlas ti 3.0 was used in the analysis.

3.7 Ethical Considerations

Written consent was obtained from all the research participants both for the quantitative interview (Appendix 3) and qualitative interviews (Appendix 4). A Kiswahili translation of the consent form was used on those who preferred to use Kiswahili (Appendix 5). Both the research participant and the research assistant signed the consent form. Those

participants, who could not write, provided their thumb prints. Throughout the process of HIV testing and counseling, confidentiality was maintained and individual rights to privacy were respected and upheld. Individual testing and counseling was done unless the individuals gave consent for couple, group or family testing.

Participants in the focus group discussions were each assigned and referred to by a number code for anonymity of their responses. Recording of the responses was done based on the code of the respondent. The participants in the focus group discussion were asked for consent for use of the tape recorder during the discussions to compliment note taking.

The study was approved by (i) the KEMRI Ethical Review Committee (Appendix 6) as well as (ii) the Associate Director of Science Centers for Disease Control and Prevention (CDC) Atlanta (Appendix 7), and (iii) by the board of post graduate studies of Jomo Kenyatta University of Agriculture and Technology (JKUAT).

CHAPTER FOUR

RESULTS

4.1 Socio demographic characteristics of the study participants

The socio-demographic characteristics of the participants are presented on Table 4.1. Although the minimum sample size calculated was 920, a maximum sample investigated and analysed was 1255 individuals. The additional participants were eligible and were found in the same households that were visited due to the intra village migration which is common in Kibera. In the inrerst of public health the individuals could not be isolated without risking fueling stigma among those selected.

Out of the 1255 participants, 834 (66.4%) were females. The median age of the participants was 28 years and 68% of them were between 18-34 years. (IQ 13-65) participated in the study. Their age distribution is shown in (Fig. 4.1) and the majority of the participants were between the ages of 18-34 years.). Slightly over half 672 (53.5%) were married with more women reporting being married than men (P < 0. 001) and 718 (57.1%) reported not being employed with slightly over two thirds either involved in unskilled jobs (39.4%) or no occupation at all (39.9%) (Fig 4.2). Those with skilled occupations were 114 (9%) and those with professional occupations were 11(0.9%). Two hundred and twenty five 225 (53.3%) men had unskilled occupations and those employed were 282 (66%), whereas among women, 270 (32.30) had unskilled occupations and those employed were 256(30.80) compared to women who hadthe majority of women (69%) reported no formal employment. Six hundred and ninety participants (690(55%) had attained primary level education, while those with secondary level of education were 471 (37.5%) and with 12 participants reporting no formal education.

Table 4.1: Socio demographic and key characteristics of participants

	Overall (N%)	Male n%	Female n%
Age in Years (mean , SD)	27.88(10.45)	30.04 (12.20)	26.78 (9.25)
Gender	1,255 (100%)	421 (33.4%)	834 (66.4%)
Age category			
13-17	150(11.90)	43(10.00)	107(12.90)
18-24	458(36.60)	136(32.20)	322(38.80)
25-34	395(31.70)	131(31.30)	264(31.90)
35-44	147(11.70)	64(14.90)	83(10.00)
45-54	69(5.40)	27(6.40)	42(5.00)
55-64	23(1.80)	13(3.10)	10(1.10)
65+	13(1.00)	9(2.10)	4(0.40)
Total	1,255(100.00)	423(100.00)	832(100.00)
Occupation			
None	501(39.90)	60(14.50)	441(52.80)
Unskilled	494(39.40)	225(53.30)	270(32.30)
Skilled	114(9.10)	76(18.00)	38(4.60)
Professional	11(0.90)	8(1.90)	3(0.40)
Student	135(10.70)	52(12.30)	83(9.90)
Total	1,255(100.00)	421(100.00)	834(100.00)
Education			
No formal	12(1.00)	2(0.50)	10(1.20)
Primary	690(55.00)	173(41.20)	516(61.90)
Secondary	472(37.50)	202(47.90)	270(32.30)
Tertiary	82(6.50)	44(10.40)	38(4.60)
Total	1,255(100.00)	421(100.00)	834(100.00)
Marital status			
Single	506(40.30)	204(48.30)	302(36.20)
Married	672(53.50)	204(48.30)	468(56.00)
Widowed/Widower	19(1.50)	2(0.50)	17(2.00)
Divorced	22(1.80)	4(0.90)	18(2.20)
Separated	38(3.00)	8(1.90)	30(3.60)
Total	1,255(100.00)	421(100.00)	834(100.00)
Employed			
Yes	538(42.90)	282(66.80)	256(30.80)
No	717(57.10)	140(33.20)	577(69.20)
Total	1,255(100.00)	422(100.00)	834(100.00)

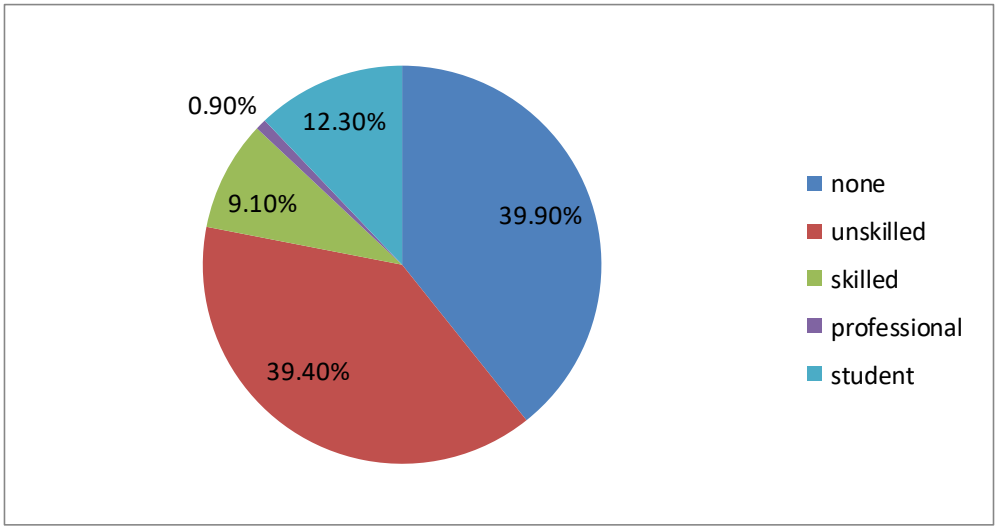

Figure 4.1: Distribution of participants by occupation shown in percentages

4.1.1 Characteristics of participants in the focus group discussions

A total of six focus group discussions were held comprising of 21 women and 25 men aged between 18 and 50 years. Each group had a range of 6-9 participants and each session lasted for between 90 and 120 minutes.

4.2 Access, uptake and experiences in HBTC among the study participants

Information about HIV testing uptake, previous testing experiences, and place of last testing is provided on Table 4.2. Out of all the 1255 participants, 1078 (85.9%) had ever tested for HIV with the majority of them 815 (75.8%) having tested in the Kibera HBTC. Females were significantly associated with HIV testing than males ($\chi^2(1)=13.80$, $P < 0.001$) but there were no differences in HBTC uptakae between males and female

($\chi^2(1)=0.43$, P = 0.511), however more females were reached with HBTC. There was significant association between place of last testing and gender with more females testing in hospital than males ($\chi^2(1)=13.80$, P < 0.001). Majority of participants reported they had re-tested for HIV several times following the initial HBTC in Kibera with the highest number (662 (61.8%)) reporting their last place of testing place as hospital followed by home 326 (30.4%), mobile outreach 55 (5.1%) and VCT center 22 (2.1%).

Of the participants who had tested in HBTC, 97.4% rated HBTC experience as either excellent (62.4%) or good (37%) and reported they would recommend HBTC to a friend. There were no differences in experience between males and females ($\chi^2(2)=0.35$, P = 0.838). The rating for experience was based on a three point criteria of convenience, friendliness and accessibility; with excellent being all three, good, any two and fair, any one of them.

Table 4.2: Access, uptake and experiences in HBTC among the study participants

Variable	Overall (N %)	Male (n %))	Female (n %)
Ever tested for HIV (p<0.001)			
Yes	1,078(85.9)	340(80.8)	738(88.5)
No	177(14.1)	81(19.2)	96(11.5)
Total	1,255(100)	421(100)	834(100)
HBTC tested (p =0.511)			
Yes	816(75.8)	264(77.4)	552(74.6)
No	262(24.2)	75(22.19)	187(25.4)
Total	1,078(100)	339(100)	737(100)
Rating of e the HBTC experience? p =0.838)			
Excellent	508 (62.4)	164(62.4)	344 (62.40)
Good	302 (37)	99 (37.3)	203 (36.8)
Fair	5 (0.6)	1(0.40)	5 (0.9)
Total	816 (100)	264(100)	552 (100)
Where did you test last for HIV? p<0.001)			
Hospital	664 (61.8)	150(43.80)	514(69.8)
Home	327 (30.4)	146 (42.6)	181(24.6)
Mobile	56 (5.1)	28 (8.2)	28(3.8)
Workplace	8 (0.7)	6 (1.8)	2(0.3)
VCT center	23 (2.1)	12 (3.5)	11(1.5)
Total	**1,078 (100)**	**342(100)**	**736(100)**

4.3 Factors associated with access and uptake of HBTC

In a logistic regression, (Table 4.3) age, occupation, marital status and education were retained as significant factors associated with HBTC. Considering the last testing place, females were less likely to test at home (OR 0.91, 95% 0.68-1.21), however, the proportion that tested in HBTC was higher (67.6%) than that of males (32.4%) comparatively. Age was significantly associated with access to HBTC (P= 0.005) with those aged 25-44 years two and half more times likely to test for HIV than others (AOR = 2.46 (1.44-4.21). The unskilled workers and those with tertiary education were one and half and twice more likely to access HBTC (AOR 1.56(1.16-2.12) and (AOR 2.18(1.12 - 4.26) respectively as do the students (AOR 1.77(1-3.12).

Table 4.3: Factors associated with access to HBTC

Variable	Tested in Kibera HBTC			OR (95% CI)	AOR (95% CI)
Sex (p=0.511)	No n(%)	Yes n(%)	N		
Male	86(30.3)	264(32.4)	350	1.00(Ref)	
Female	198(69.7)	551(67.6)	749	0.91(0.68-1.21)	
Age (p=0.005)					
13-17	20(7.1)	61(7.5)	81	1.46(0.85-2.53)	1.63(0.93-2.84)
18-24	131(46.3)	273(33.7)	404	1.00(Ref)	1.00(Ref)
25-34	91(32.2)	289(35.7)	380	1.52**(1.11-2.09)	1.52*(1.09-2.12)
35-44	22(7.8)	118(14.6)	140	2.57***(1.56-4.25)	2.46**(1.44-4.21)
45-54	13(4.6)	48(5.9)	61	1.77(0.93-3.38)	1.7(0.85-3.4)
55-64	3(1.1)	14(1.7)	17	2.24(0.63-7.93)	1.53(0.4-5.79)
65+	3(1.1)	7(0.9)	10	1.12(0.28-4.4)	0.99(0.25-3.95)
Occupation (p=0.017)					
None	141(49.6)	310(38)	451	1.00(Ref)	
Unskilled	102(35.9)	350(42.9)	452	1.56**(1.16-2.1)	
Skilled	22(7.7)	80(9.8)	102	1.65(0.99-2.76)	
Professional	2(0.7)	9(1.1)	11	2.05***(0.44-9.6)	
Student	17(6)	66(8.1)	83	1.77(1-3.12)	
Education (p=0.161)					
Primary or less	169(59.5)	446(54.7)	615	1.00(Ref)	1.00(Ref)
Secondary	103(36.3)	312(38.3)	415	1.15(0.86-1.53)	1.29(0.96-1.73)
Tertiary	12(4.2)	57(7)	69	1.8(0.94-3.44)	2.18*(1.12-4.26)
Marital status (p=0.027)					
Single	116(40.8)	271(33.3)	387	0.71*(0.54-0.95)	0.79(0.57-1.1)
Married	150(52.8)	492(60.4)	642	1.00(Ref)	1.00(Ref)
Widowed/Widower	1(0.4)	17(2.1)	18	5.18(0.68-39.27)	4.45(0.55-35.67)
Divorced	5(1.8)	13(1.6)	18	0.79(0.28-2.26)	0.64(0.22-1.89)
Separate	12(4.2)	22(2.7)	34	0.56(0.27-1.16)	0.52(0.25-1.09)
Total	284(100)	815(100)	1099		

***, **, * represent significance at 0.1%, 1%, and 5% levels respectively

4.3.1 Knowledge and reported disclosure of HIV status among participants

Out of the 1255 participants a total of 1,099 participants (Table 4.4) responded to the question about knowledge of their HIV status., Out of those, 1028 (93.3%) reported they were aware of their HIV status, while 71(6.5%) reported on the contrary. Females were significantly ($\chi^2(1)=8.88$, P=0.003) more associated with knowledge of their HIV status. Out of those reporting previous testing, 25 self-reported HIV positive status. Of the 1,099 participants, 593(54%) responded to the question about disclosure. Of those, 353 (60%) reported they had disclosed their HIV status to their sexual partners. There were more females (64.5%) than males (49.2 %.) ($\chi^2(1)=12.1$, P = 0.001) who reported disclosure of HIV status to sexual partners.

Table 4.4: Knowledge and Disclosure of HIV status among participants

	Overral (N %)	Male (n %)	Female (n %)
Do you know your HIV status? ($\chi^2(1)=8.88$, P=0.003)			
Yes	1,028(93.5)	317(90.3)	711(95.1)
No	71(6.5)	34(9.7)	37(4.9)
Total	1,099(100)	351(100)	748(100)
HIV status disclosure to sexual partner($\chi^2(1)=12.1$,P=0.001)			
Yes	353(59.5)	**92(49.2)**	**261(64.3)**
No	240(40.5)	95(50.8)	145(35.7)
Total	593(100)	187(100)	406(100
Knowledge of sexual partner's HIV status ($\chi^2(2)=3.79$, P=0.150)			
Yes	431(40.7)	130(38.80)	301(41.0)
No	500(47.2)	155(46.30)	345(47.7)
Not sure	128(12.1)	50(14.90)	78(10.8)
Total	1,059(100)	335(100)	724(100

4.3.2 Factors promoting HTC uptake and reported experiences during previous HBTC

The majority of the FGD participants reported that HBTC was a convenient method of testing; the providers' approach and demeanor was very polite and satisfactory and that they explained everything in detail and sought consent before introducing the test. The participants reported that HBTC removed the fear of testing for HIV and as a result residents re-tested many times whenever there was an opportunity for HIV testing and counseling.

"*HBTC saves time you will be tested when cooking your meal*" *(Female 18-30years)*

> *"We should be given services after 1-2 months, this because of the way we interact with one another and the situation we live in" (Male 31-50 years)*

The FGD participants reported that testing for HIV in this community was regarded as normal (there was no fear of taking the test) following the initial HBTC service offered previously and reported having re - tested several times thereafter but prior to that, people feared to test for HIV. The participants reported that many of them accessed HTC services as groups of friends and that this was a common occurrence among the residents as they were aware that they shared sexual partners. Knowledge about sharing of sexual partners also made them test for HIV from time to time whenever there was an opportunity for testing. Other than removing fear of testing for HIV, participants reported they clarified misconceptions about HIV in couples' HIV status.

> *"When I was tested, my husband was in the house but did not want to wake up. He just said 'when I hear your status is bad, please I will be the way you are found" (Female 35 years)*

"I *could have a girlfriend and have "raha" (fun) with her and wish her goodnight. You will then meet with her in the morning from her night activities, this means that she never spent the night at her place. A lady like this could have sex with all men in the community (all laugh). This makes us to test" (Male 31-50 years).*

Although there was overwhelming report about the convenience and satisfaction with HBTC, a few participants pointed out concerns that some providers were always in a hurry and were also not sensitive to the presence of children as they did condom demonstration.

"The first thing they say is that we come from KEMRI/CDC and we do HIV counseling and testing without separating the children, they go as far as explaining how to use condoms and the children are underage" (Male 50 years)

Further, a few of the FGD participants also reported that the service providers were gossipers and were often heard talking about their experiences in the households they had visited as they walked through the community.

> *"They should not follow one another like Kobe (Kiswahili name for tortoise) because when they do, they get time to gossip"*

4.4 Couples and sexual partners' access to and experiences with HBTC

4.4.1 Demographic characteristics of participants who accessed HBTC as couples.

A total of 1222 participants reporting HIV negative status, comprising those who tested in HBTC and those who had never tested for HIV accepted to be tested in this study, the majority (66.4%) being females.

Of those who reported having tested as couples previously, the majority (84%) had been tested in HBTC as compared to other testing sites. The difference was significant ($P < 0.001$). Other testing sites included hospitals, VCT centers, out-reach and workplace

sites. Gender, age, occupation and marital status were significantly associated with couple testing uptake. There were nineteen percent (19.6%) of participants testing as couples in the current study, compared to 33.9 % individuals who reported having tested as couples in the previous HBTC. This percentage change difference was significant in all demographic characteristics except those who were male (Z = 1.02, P = 0.307), ages 35-44 years (Z=1.55, P = 0.121), 45-54 (Z = 0.77, P = 0.442), 55-64 (Z =-0.3, P = 0.762), above 65 years old (Z=-0.3,P = 0.762), separated (Z=1.54, P = 0.123) and divorced (Z = 0.48, P = 0.629) (Table 4.5).

Table 4.5: Couple testing uptake and percentage change in testing prevalence with repeated testing opportunity

	Number tested in previous Kibera HBTC			Percentage change in testing			
	p-value	n/N	%	n/N	%	p-value	%
Sex							
Male		92/286	322	119/416	28.6	Z=1.02,P=0.307	-3.6
Female		221/637	347	121/808	15	Z=8.75,P<0.001	-19.7
Total		313/923	339	240/1224	19.6	Z=7.5,P<0.001	-14.3
Age							
13-18		9/52	173	10/149	6.7	Z=2.25,P=0.024	-10.6
19-24		96/320	**30**	61/454	**13.4**	Z=5.66,P<0.001 11	-16.6
25-34		129/349	37	98/383	25.6	Z=3.33,P=0.001	-11.4
35-44		53/125	424	45/136	33.1	Z=1.55,P=0.121	-9.3
45-54		16/48	333	17/64	26.6	Z=0.77,P=0.442	-6.7
55-64		5/16	313	4/22	18.2	Z=0.94,P=0.349	-13.1
65+		3/9	333	4/10	40	Z=-0.3,P=0.762	6.7
Total		311/919	**338**	239/1218	**19.6**	Z=7.44,P<0.001	-14.2
Occupation							
None		138/399	346	70/489	14.3	Z=7.11,P<0.001	-20.3
Unskilled		123/386	31.9	128/476	26.9	Z=1.61,P=0.108	-5
Skilled		41/92	446	35/113	31	Z=2,P=0.045	-13.6
Professional		4/8	50	3/11	27.3	Z=1.01,P=0.311	-22.7
Student		7/38	184	4/135	3	Z=3.43,P=0.001	-15.4
Total		313/923	339	240/1224	19.6	Z=7.5,P<0.001	-14.3
Education							
No formal		2/8	25	0/11	0	Z=1.75,P=0.08	-25
Primary		171/526	325	138/667	20.7	Z=4.62,P<0.001	-11.8
Secondary		119/332	358	88/465	18.9	Z=5.37,P<0.001	-16.9
Tertiary		21/57	368	14/81	17.3	Z=2.59,P=0.01	-19.5
Total		313/923	339	240/1224	19.6	Z=7.5,P<0.001	-14.3
Marital status		$\chi^2(4)=53.99$,*<0.001*					
Single		48/253	19	17/503	3.4	Z=7.21,P<0.001	-15.6
Married		262/631	415	221/646	34.2	Z=2.69,P=0.007	-7.3
Widowed/Widower		0/9	0	0/16	0	Z=,P<0.001	0
Divorced		2/14	143	2/22	9.1	Z=0.48,P=0.629	5.2
Separate		1/16	6.3	0/37	0	Z=1.54,P=0.123	-6.3
Total		313/923	339	240/1224	19.6	Z=7.5,P<0.001	-14.3

4.4.2 Reported experiences with couple testing among the study participants

Participants in the FGDs reported that before HBTC was widely accepted by the slum residents, individuals assumed that their partner's HIV status would be the same as their own and therefore needed not test as couples. They reported that this assumption changed with more knowledge acquired from HBTC. Overall, the participants were unanimous that couple testing and counseling is viewed by residents as a good thing and can help couples plan their lives.

"When I was tested, my husband was in the house but did not wake up. He just said 'when I hear your status is bad, please I will be the way you are found" (Female 35 years)

"*If you are both tested, you take care of yourself and avoid extra relationships" (Male31-50 years)*

Participants reported that many challenges and barriers to testing as couples are attributed to fear of obtaining HIV discordant results and the likelihood or fear of separation or divorce following the results. The other challenge hindering couple testing was reported to be the absence of spouses from home as they seek sources of livelihood away from the slum dwelling during day time.

"The thing that brings problems is when we are tested together and one is found uninfected while the other is infected, that will force divorce to proceed" (Male 31-50 years)

"*You know what makes people to refuse testing together, is the counseling that one is infected and the other not and that you may find out when I am tested and found infected and my partner not infected, that can cause my partner to conclude that I want to infect her and then move out" (Male 31-50 years)*

"*… there are those who might not accept it…. (Meaning sex) provided she knows that you have it and she is negative, your marriage would be in problems irrespective of counseling". (Male 31-50 years*)

"*I have seen acouple who separated, the husband lives in Kawangware and the wife lives in Kibera, the child is positive because the wife is the one who is positive" (Female 31-50 years)*

'*The only time you can find couples is over the weekend. They found me on a weekend, because over week days I have other programs to attend to" (Male 18-30 years)*

4.5 Uptake and Utilization of HIV prevention messages delivered in HBTC.

4.5.1 Prevention messages received in previous HBTC.

The delivery of prevention messages in HBTC compared to other testing sites is shown on table 4.6. The most prevalent prevention messages given across all testing sites (HBTC, Hospital, VCT, workplace, and mobile outreach sites) were condom use (85%), faithfulness to one partner (72%) and reduction in number of sexual partners (57%). The place of testing was significantly associated with messages provided: faithfulness (78% in HBTC versus 67% elsewhere (χ^2 (1) = 11.3098, *P=0.001*), number of sexual partner reduction (64% versus 52% (χ^2 (1) = 12.0066 *P=0.001*) were more prevalent in HBTC than at other testing sites. Although there were (85.4%) participants reporting receipt of condom use demonstration and counseling at testing sites other than in HBTC (83%), this was not significant (χ^2 (1) = 0.8133, P = 0.367). STI treatment messages, on the other hand, were more prevalent at other testing sites (23%) than in HBTC (16%).

Table 4.6: HIV prevention messages received by place of testing.

	Place of testing					
Type of Prevention message	**Tested elsewhere**		**In HBTC***		**Total**	
	No.	%	No.	%	No.	%
Condom use ((χ^2(1) = 0.8133, P=0.367)						
No	73	14.60%	53	17.00%	126	15.50%
Yes	426	85.40%	259	83.00%	685	84.50%
Total	499	100.00%	312	100.00%	811	100.00%
Being faithfulness ((χ^2 (1) = 11.3098,P=0.001)						
No	163	32.70%	68	21.70%	231	28.40%
Yes	336	67.30%	245	78.30%	581	71.60%
Total	499	100.00%	313	100.00%	812	100.00%
Partner reduction ((χ^2 (1) = 12.0066, P=0.001)						
No	241	48.30%	112	35.90%	353	43.50%
Yes	258	51.70%	200	64.10%	458	56.50%
Total	499	100.00%	312	100.00%	811	100.00%
Need for VMMC ([χ^2(1) = 0.1431 ,P=0.705)						
No	344	69.20%	212	67.90%	556	68.70%
Yes	153	30.80%	100	32.10%	253	31.30%
Total	497	100.00%	312	100.00%	809	100.00%
STIs (χ^2 (1) = 0.7647, P=0.382)						
No	476	95.60%	293	94.20%	769	95.10%
Yes	22	4.40%	18	5.80%	40	4.90%
Total	498	100.00%	311	100.00%	809	100.00%
*STI treatment (χ^2(1) = 6.3759, P=0.012)						
No	383	76.90%	262	84.20%	645	79.70%
Yes	115	23.10%	49	15.80%	164	20.30%
Total	498	100.00%	311	100.00%	809	100.00%
Enrollment And Treatment of HIV (χ^2(1) = 0.0347 P=0.852)						
No	413	83.10%	260	83.60%	673	83.30%
Yes	84	16.90%	51	16.40%	135	16.70%
Total	497	100.00%	311	100.00%	808	100.00%

*Changing denominators due to non respose in the variable

*STI - Sexually Transmitted Infections

*HBTC - Home based tEsting and counseling

4.5.2 Demographic characteristics of those reporting receipt of HIV prevention messages.

The demographic covariates under consideration were agender, age categories, education, occupation, marital status and number of sexual partners in the last three months. Table 4.7 shows the association between HIV prevention messages received and the selected covariates and table 4.8 shows the proportions of participants reporting receipt of specific prevention messages in the particular covariate. There was no significance in receipt of condom messages in HBTC by gender (χ^2 (1) = 0.8133, P = 0.387), age categories (χ^2(6) = 12.0003P=0.62), and number of seual partners in the last 3 months (χ^2(1) = 2.0432, P= 0.153). Faithfullness message was statistically significant by and marital status (χ^2 (1) = 11.3098, P= 0.01). The statistically significant covariates were occupation by partner reduction (χ^2 (4) = 8.8812, P=0.06); STI treatment messaging was highly significant in all the covariates. Low proportions of those with no formal education reported receipt of prevention messages; condoms (54.5%), partner reduction (45.5%) and VMMC (18%) only but nearly all of them reported receiving faithfulness messages (90%). Individuals who are skilled workers on the other hand reported low receipt of faithfulness and partner reduction messages. Condom messages was the highest reported message followed by faithfullness and partner reduction and the rest of the messages (VMMC, STI and Treatment of HIV) had very few indiduals reporting their receipt ranging from (3.5%-40%). (Table 4.8).

Table 4.7: Association between prevention messages and demographic characteristics

	Condom use (P value)	Faithfulness (P value)	Partner reduction (P value)	VMMC (P value)	STI (P value)	STI treatment (P value)	Treatment enrolment(P value)
Tested in HBTC	0.367	**0.001**	**0.001**	0.705	0.382	**0.012**	0.852
Gender	0.387	0.32	0.58	0	0.65	0.001	0.22
Age categories	0.062	0.032	0.369	0.095	0.773	**0.021**	0.236
Occupation	**0.008**	0.26	0.06	0.88	0.65	**0.001**	0.92
Education	**0.02**	0.26	0.71	0.09	0.35	0.1	0.47
Marital status	**0.037**	**0.01**	0.25	0.23	0.36	**0.001**	**0.1**
Number of partners in the last 3 months	0.153	0.81	0.88	0.42	0.16	**0.001**	0.81

Table 4.8: Prevention messages received during HBTC by selected covariates

	Condom use (%)	Faithfulness (%)	Partner reduction (%)	VMMC (%)	STI (%)	STI treatment (%)	Treatment enrolment (%)	Total (N)
Tested in HBTC								
No	85.4	67.3	51.7	30.8	4.4	23.1	16.9	497
Yes	83	78.3	64.1	32.1	5.8	15.8	16.4	311
Sex								
Male	83	69.5	58.1	38.9	4.5	5.3	14.4	264
Female	85.4	72.9	56.1	28.1	5.3	27.9	17.8	551
Age categories								
13-18	95.1	65.6	63.9	39.3	6.6	11.5	8.2	149
19-24	84.7	66.1	51.5	36.6	5.5	18.7	14.3	457
25-34	81.1	74.3	57.4	29.3	3.5	26.2	19	396
35-44	87.3	75.4	58.5	22.9	6.8	22.9	18.6	146
45-54	87.5	85.4	66.7	31.3	4.2	12.5	20.8	68
55-64	71.4	85.7	57.1	21.4	7.1	7.1	21.4	22
65+	100	57.1	57.1	42.9	0	0	0	12
Occupation								
None	84.9	74.4	59.6	32.9	4.2	28.6	17.7	310
Unskilled	82	71.8	55.7	29.9	5.7	18.3	16.6	350
Skilled	81.5	61.7	43.2	35	3.7	10	16.3	80
Professional	100	77.8	66.7	33.3	0	0	11.1	9
Student	98.5	71.2	63.6	30.3	7.6	10.6	13.6	66
Education								
No formal	54.5	90.9	45.5	18.2	0	18.2	9.1	11
Primary	84.9	72.8	57	34	5.5	23.9	18.4	435
Secondary	84	68.9	55.8	27.2	3.8	17	14.4	312
Tertiary	91.4	76.3	62.1	39.7	8.6	15.8	17.5	57
Marital status								
Single	88.6	64.7	54.8	36.2	5.5	11.8	12.2	271
Married	82.8	75.2	57.5	30	4.7	26	18.5	492
Widowed/Widower	76.5	70.6	47.1	29.4	5.9	23.5	29.4	17
Divorced	100	100	84.6	15.4	15.4	23.1	15.4	13
Separate	72.7	68.2	54.5	22.7	0	4.5	22.7	22
Number of partners in the last 3 months								
One partner	84.6	73.9	58.1	31.5	5.1	25.5	17.8	
2+ partners	75.7	75.7	56.8	37.8	0	2.7	16.2	567

4.5.3 Prevention Message provision index by demographic characteristics.

HIV prevention messages received and the relationship between selected demographic characteristics and the constructed composite prevention message provision of low, medium and high index during previous HBTC are shown on Table 4.9. It also shows the level of prevention message receipt by demographic characteristics. Three hundred and thirty nine participants (41.4%) ranked in the medium HBTC provision index, low index had 286 (34.9%) and high index with 194 (23.7%). The unadjusted results suggest the level of access to prevention messages was higher among females than males (OR=1.45, 95% CI=1.11-1.90); significantly higher among individuals 25-34 years (OR=1.85, 95% CI=1.09-2.95) and those 55-64 years were three times more (OR=3.22, 95% CI=1.08-9.59) compared to those 13-24 years; and nearly twice (OR 1.79 (1.36 - 2.3)) higher among the separated individuals compared to those that were single. The adjusted results show that age, occupation and marital status were statistically significant and are the main factors associated with levels of access to HIV prevention messages in HBTC.

Table 4.9: Prevention Message provision index by demographic characteristics.

	Prevention message provision index					
	Low	Middle	High	Total	RR(95% CI)	ARR (95% CI)
	n (%)	n (%)	n (%)	N		
Sex ($\chi^2(2)=13.66$, P=0.001**)**						
Male	101(38)	123(46.2)	42(15.8)	266	1.00	1.00
Female	185(33.5)	216(39.1)	152(27.5)	553	1.45**(1.11,1.9)	1.21(0.88,1.66)
Age category in years ***(***$\chi^2(12)=29.23$, *P=0.004)*						
13-17	22(36.1)	34(55.7)	5(8.2)	61	1.00	1.00
18-24	115(42)	108(39.4)	51(18.6)	274	1.04(0.63,1.71)	1.08(0.62,1.9)
25-34	91(31.2)	114(39)	87(29.8)	292	1.8*(1.09,2.95)	1.84*(1.01,3.37)
35-44	37(31.4)	51(43.2)	30(25.4)	118	1.61(0.92,2.81)	1.75(0.88,3.5)
45-54	14(29.2)	21(43.8)	13(27.1)	48	1.77(0.89,3.51)	1.75(0.79,3.9)
55-64	3(21.4)	5(35.7)	6(42.9)	14	3.22*(1.08,9.59)	3.51*(1.07,11.54)
65+	3(42.9)	4(57.1)	0(0)	7	0.73(0.18,2.92)	0.72(0.17,3.07)
Occupation **(**$\chi^2(8)=26.99$**,** P=0.001)						
None	95(30.4)	132(42.3)	85(27.2)	312	1.00	1.00
Unskilled	130(37)	133(37.9)	88(25.1)	351	0.8(0.6,1.06)	0.71*(0.52,0.98)
Skilled	38(46.9)	28(34.6)	15(18.5)	81	0.52*(0.33,0.83)	0.49**(0.29,0.83)
Professional	2(22.2)	7(77.8)	0(0)	9	0.7(0.23,2.11)	0.56(0.17,1.89)
Student	21(31.8)	39(59.1)	6(9.1)	66	0.66(0.41,1.06)	1.06(0.57,1.97)
Education ($\chi^2(4)=4.02$, P=0.404**)**						
Primary or less	154(34.4)	179(40)	115(25.7)	448	1.00	1.00
Secondary	113(36.2)	130(41.7)	69(22.1)	312	1.02(0.33,3.14)	1.18(0.37,3.73)
Tertiary	19(32.2)	30(50.8)	10(16.9)	59	0.89(0.29,2.78)	1.35(0.42,4.31)
Marital status ($\chi^2(4)=32.40$, **P<0.001)**					0.89(0.27,2.97)	1.51(0.42,5.5)
Single	110(40.4)	129(47.4)	33(12.1)	272		
Married	163(32.9)	185(37.4)	147(29.7)	495	1.00	1.00
Separated	13(25)	25(48.1)	14(26.9)	52	1.79***(1.36,2.36)	1.49*(1.05,2.12)

***, **, * represent significance at 0.1%, 1%, and 5% levels of significance, respective

4.5.4 HIV Prevention messages received in HBTCas reported from focus group discussions

The study participants were unanimous that they were given good and useful information on how to protect themselves against HIV infection. However, while some said the information given was new, others reported the information was not new but in the home it was given in a more friendly way and they also had the chance of testing with their spouses.

"*I was told I could use a CD (condom) or that I could be faithful to one partner. He also told me that if I had HIV I could use some drugs and we also discussed where I could get them" (Male 18-30 years)*

"They also ask you if you are married or in a relationship and the importance of being tested together" (Female 31-50yeras)

"Like for me who has a partner when I go to the dispensary to test and tests negative and may be my partner is positive…. So when they come, they will make you know the reality if you are together and test you as acouple (Female 31-50Years)

4.6 Use of HIV prevention messages and behaviour change following HBTC among study partcipants.

4.6.1 Sexual behavior following HBTC among study partcipants.

The number of sexusl partners is reported, condom demonstration and subsequent use following HBTC among males and females in Table 4.10. The majority (68%) of the participants reported they had sexual intercourse in the previous three months, most of them (93%) reporting one sexual partner. Males (15.4%) had more sexual partners than females (2.3%) and this was statistically significant at ($\chi^2(1)=52.87$, $P < 0.001$). Although most (82.8%) of the participants reported having had a condom demonstration at the last HBTC, only 39.6% reported having been offered condoms at the time, out of

which the majority (97.2%) declined to take the condoms. The most commonly (95.9%) cited reason for not taking up condoms when offered was no need for them, other reasons were; out of stock (1%), prefer to buy (0.6%) and no reason (2.5%) (Fig. 4.3). Condom receipt was significantly different between males and females with more males receiving condoms than females ($\chi^2(1)=1.38$, P = 0.001). The majority of the participants (80%) reported they had never used condoms in their life time despite receiving demonstrations on how to use them, and only 10.7% reported consistent use of condoms. Of those reporting non-condom use at the last sexual activity, 80.7% reported they trusted their sexual partners. Only three percent (3%) of the participants reported partner refusal to use condoms.

When asked about knowledge of sexual partner HIV status and whether the status had been disclosed either way, only 593 out of 1255 (42.7%) participants responded to the disclosure question, out of which 353 (59.5 %) reported they had disclosed their status to their sexual partners. More females (64.3 %) reported having disclosed their HIV status to their sexual partners than males (49.2%).

Table 4.10: Sexual partners, condom demonstration and use following HBTC

Variable	Overall (N)	Male (n %)	Female (n %)
Had sex in the last 3 months (P = 0.827)			
Yes	854(67.90)	285(67.50)	569(68.10)
No	403(32.10)	137(32.50)	266(31.90)
Sexual partners in the last 3 months ($\chi^2(1)=52.87$, P < 0.001)			
One partner	798(93.30)	241(84.60)	557(97.70)
2+ partners	57(6.70)	44(15.40)	13(2.30)
Had condom use demonstration ($\chi^2(1)=1.38$, P = 0.240)			
Yes	1,037(82.80)	341(81.00)	696(83.70)
No	216(17.20)	80(19.00)	136(16.30)
Offered Condoms during the last HIV test ($\chi^2(1)=50.18$, P = 0.001)			
Yes	278(25.72))	135(39.59)	143(19.32)
No	803(74.28))	206(60.41)	597(80.68)
Used condoms in the last 3 months? ($\chi^2(1)=8.05$, P = 0.018)			
Always	92(10.70)	36(12.70)	56(9.80)
Sometimes	80(9.30)	36(12.70)	44(7.70)
Never	685(79.90)	212(74.60)	473(82.50)

Denominators vary due to missing values and due to non responses.
The precentages (%) are variable specific.

4.6.1.1 Factors associated with multiple sexual partners among the study participants

Factors associated with having more than one sexual partner included being male ($\chi^2(1)=52.87, P = 0.001$), those with skilled jobs ($\chi^2(5)=3.28, P = 0.012$), single individuals ($\chi^2(4)=45.16, P = 0.005$) those who do not know their HIV status ($\chi^2(4)=45.16, P = 0.005$) and those who had never tested for HIV ($\chi^2(4)=45.16, P = 0.016$). Among the age categories, those aged above 55 years were 2-3 times more likely to have more than 2 sexual partners compared to the other age categories (Table 4.11). Condom use demonstration was not associated with number of sexual partners ($\chi^2(1)=0.61, P = 0.434$).

Table 4.11: Sexual partners following HBTC by demographic characteristics

	Number of partners in the last 3 months		
	One partner	**2+ partners**	Total
	n(%)	n(%)	n
Gender ($\chi^2(1)=52.87$, P = 0.001)			
Male	241(84.6)	44(15.4)	285
Female	557(97.7)	13(2.3)	570
Total	798(93.3)	57(6.7)	855
Age category in years P = 0.657			
13-18	42(93.3)	3(6.7)	45
19-24	268(93.4)	19(6.6)	287
25-34	310(93.1)	24(6.9)	334
35-44	113(95.8)	5(4.2)	118
45-54	45(91.8)	4(8.2)	49
55+	19(85.7)	3(14.3)	22
Total	795(93.3)	57(6.7)	855
Occupation ($\chi^2(5)=3.28$, P = 0.012)			
None	345(96.1)	14(3.9)	359
Unskilled	348(92.3)	29(7.7)	377
Skilled	76(86.4)	12(13.6)	88
Professional	9(100)	0(0)	9
Student	20(90.9)	2(9.1)	22
Total	798(93.3)	57(6.7)	855
Marital status ($\chi^2(4)=45.16$, P = 0.001)			
Single	166(84.3)	31(15.7)	197
Married	613(96.4)	23(3.6)	636
Widowed/Widower	3(100)	0(0)	3
Divorced	9(100)	0(0)	9
Separate	7(70)	3(30)	10
Total	798(93.3)	57(6.7)	855
Had condom use demonstration condoms? ($\chi^2(1)=0.61$, P = 0.434)			
Yes	711(93.4)	50(6.6)	759
No	85(90.4)	9(9.6)	94
Total	796(93.1)	59(6.9)	855

Significant at p < 0.1

4.6.2 Change of Sexual behavior by place of testing.

Comparison of the the proportions of those who reported change from risky sexual behavior by place of last HIV testing is given in Table 4.12. Although overall, 64.5% of participants reported no change in their sexual behavior after receiving HTC, this was not significant ($\chi^2(4)=1.93$, P = 0.749) by place of testing. Use of protection during sexual intercourse was the only significant factor ($\chi^2(4)=11.4$, P = 0.022) by place of testing with the highest percentage (31.8% though also low) of those who used protection being reported among the participants whose last testing point was VCT. Those whose last testing point was home were (16.3%), while those testing in hospitals was a low of (11.3%) of the participants who reported use of protection at sexual intercourse. Although there was comparatively more participants reporting reduction of number of sexual partners after testing in mobile outreach (23.6%) as compared to hospital (17.5%), home (18.1%) and VCT (18.2%) this finding was not statistically significant ($\chi^2(4)=2.83$, P=0.586).

Table 4.12: Change of sexual behavior by place of last HIVtesting

Sexual Behavior	**Place of testing**					
	Hospital n(%)	Home n(%)	Mobile n(%)	Workplace n(%)	VCT n(%)	Total n(%)
Protected Sex ($\chi^2(4)=11.4$, p=0.022)						
No	587(88.7)	273(83.7)	46(83.6)	6(85.7)	15(68.2)	927(86.5)
Yes	75(11.3)	53(16.3)	9(16.4)	1(14.3)	7(31.8)	145(13.5)
Nothing changed ($\chi^2(4)=1.93$, p=0.749)						
No	194(29.3)	97(29.8)	19(34.5)	1(14.3)	8(36.4)	319(29.8)
Yes	468(70.7)	229(70.2)	36(65.5)	6(85.7)	14(63.6)	753(70.2)
Stopped Sex (p=0.435)						
No	618(93.4)	310(95.1)	51(92.7)	7(100)	19(86.4)	1005(93.8)
Yes	44(6.6)	16(4.9)	4(7.3)	0(0)	3(13.6)	67(6.3)
Reduced number of sexual partners ($\chi^2(4)=2.83$, **p=0.586)**						
No	546(82.5)	267(81.9)	42(76.4)	7(100)	18(81.8)	880(82.1)
Yes	116(17.5)	59(18.1)	13(23.6)	0(0)	4(18.2)	192(17.9)
Total	662(100)	326(100)	55(100)	7(100)	22(100)	1072(100)

4.6.2.1 Bivariate analysis of reported change in sexual behaviour following HBTC.

Bivariate analysis of the relationship between the sexual behavior change indexes by demographic characteristics is shown on Table 4.13. Sexual behavior change was significantly associated with all the demographic characteristics except employment status and whether the partner was new or not. The table also provides data about change from risky sexual behavior since the last HBTC. Overall females were less likely (OR 0.46, 0.25-0.83) than men to practice safer sex after learning their HIV status and was significant ($\chi^2(1)=6.90, P = 0.009$). Change from risky sexual behavior declined with increasing age but increased with education as those reporting tertiary education were twice more likely to adopt safer sexual practices after learning their HIV status (OR 2.130, 0.24-18.56). Marital status was associated ($\chi^2(4)=59.55, P = 0.001$) with the adoption of safe sexual practices, with married individuals less likely (OR 0.06, 0.002-0.16)) to adopt safe sex practices compared to singles. Students were nearly three times more likely to change from HIV risky sexual behvaiour after learning of their HIV status (OR 2.92, 1.72-7.27) as were professional people who were six times more likely to change form risky sexual behavior (OR 6.04, 1.15-31.78) after learning of their HIV status.

Table 4.13: Adoption of safe sexualpractices by selected demographic characteristics

	No change n(%)	To safer n(%)	Total N	OR (95% CI)
Gender ($\chi^2(1)=6.90$, p=0.009)				
Male	241(91.3)	23(8.7)	264	1.00
Female	528(95.8)	23(4.2)	551	0.46*(0.25-0.83)
Total	769(94.4)	46(5.6)	815	
Age ($\chi^2(4)=15.15$, p=0.004)				
13-18	55(88.5)	7(11.5)	61	1.00
19-24	250(91.2)	24(8.8)	273	0.740(0.3-1.81)
25-34	279(96.2)	11(3.8)	289	0.31(0.11-0.82)
35-44	117(98.3)	2(1.7)	118	0.13(0.03-0.66)
45+	68(97.1)	2(2.9)	69	0.230(0.05-1.15)
Total	769(94.3)	46(5.7)	815	
Occupation ($\chi^2(4)=11.05$, p=0.026)				
None	296(95.5)	14(4.5)	310	1.00
Unskilled	333(95.1)	17(4.9)	350	1.080(0.52-2.23)
Skilled	75(93.8)	5(6.3)	80	1.410(0.49-4.04)
Professional	7(77.8)	2(22.2)	9	6.04*(1.15-31.78)
Student	58(87.9)	8(12.1)	66	2.92*(1.17-7.27)
Total	769(94.4)	46(5.6)	815	
Education($\chi^2(4)=18.67$, p<0.001)				
Non- formal	10(90.9)	1(9.1)	11	1.00
Primary	419(96.3)	16(3.7)	435	0.380(0.05-3.17)
Secondary	293(93.9)	19(6.1)	312	0.650(0.08-5.33)
Tertiary	47(82.5)	10(17.5)	57	2.130(0.24-18.56)
Total	769(94.4)	46(5.6)	815	
Marital status ($\chi^2(4)=59.55$, p<0.001)				
Single	232(85.6)	39(14.4)	271	1.00
Married	487(99)	5(1)	492	0.06***(0.02-0.16)
Widowed/Widower	16(94.1)	1(5.9)	17	
Divorced	13(100)	0(0)	13	
Separate	21(95.5)	1(4.5)	22	0.240(0.06-1.02)
Total	769(94.4)	46(5.6)	815	
Employed ($\chi^2(1)=1.10$, p=0.294)				
Yes	362(95.3)	18(4.7)	380	1.00
No	407(93.6)	28(6.4)	435	1.380(0.75-2.54)
Total	769(94.4)	46(5.6)	815	

***, **, * represent significance at 0.1%, 1%, and 5% levels of significance, respectively.

4.6.3 Results from focus group discussions on Sexual Behaviour following HBTC

4.6.3.1 Reported sexual behaviour following receipt of prevention messages in HBTC

From the FGDs, the majority of the participants' unaimously reported that the prevention messages delivered during HBTC were not used by the receipents. They however reported that, condoms are mainly used by the younger people and that their use in marriage is challenging as it is viewed with suspicion of infidelity on the part of the partner suggesting its use.

"Using Condoms means that you have other affairs….." (Male, 27 years)

"*That information is not effective, I know three people who are HIV positive and they are not using condoms" (Female, 24 years)*

"When I was tested and found negative I added another wife and she gave me a child. We were tested last year with my partner and we were found to be negative but I have another sexual partner but we have never tested together", (Male 42 years)"

The FDGs reported that in matters sexual, the man is always in control and that the decision to use condoms is left to them but they turn out not to be trusted as they cheat about its use.

> '*Men are usually so fast when they come to you, you might think that their mind is there putting on that condom. You may be cheated that he has put it on and with you, you are lying there waiting for a man to get inside you' (Female 18- 30 years)*

The participants' also reported that casual sex with multiple and concurrent sexual partners without use of protection among the residents in the informal settlement both among those who were HIV infected and those not infected is a very common practice.

"*In this life we live, we have sexual intercourse (pause)… with your girlfriend. Let me say you are married and then you have this one else somewhere and you have sex or by bad luck you were with someone else taking……(laughter).''(Male -18-30 years)*

In addition to partner trust reported in quantitative study, the FGD participants also reported that those who are HIV positive do not use condoms as they did not see the need of doing so. The participants reported there are beliefs among Kibera residents that condom use hinders the enjoyment of sex.

"… *those who are positive do not see the need to use condoms even after getting explanation from doctors on how to use them for they argue that you cannot take a sweet with a wrapper and that makes them die quickly*." (*Male 31-50 years)*

"If those in HIV programs were consistent in condom use then they would not be giving birth at this rate. You find women who have been advised to use condoms to prevent re-infection continue to give birth" (Female 31-50 years)

4.6.4 HIV Sero-conversion among those who reported previous HIV negative status.

HIV sero-conversion yield after previous HIV negative test results of participants is shown on table 4.14. A total of 1222 participants reported they were HIV negative or had never been tested for HIV and accepted to be tested for HIV in this study. Of those, 39 (3.4%) participants tested HIV positive. Out of the 1,222 participants, 991 reported previous HIV testing with HIV negative results. Of the 991 participants who reported previous HIV negative status, 28 (2.8 %) tested HIV positive in this study. A total of 750 out of the 991 participants who had recived an HIV test before, reported having been

tested in HBTC. Those who turned HIV positive from the 750 were 18 (2.4%), the majority (82%) of these were females aged 19 -34 years. Slightly over half (53.6%) were not employed or were engaged in unskilled jobs and the highest level of education attained by the majority (75%) was primary school or non- formal education and half of them were married.

Table 4.14: HIV sero-conversion among males and females after a previous HIV negative result

	Overall N (%)	**Male N (%)**	**Female N (%)**
Previously tested and tested in current study			
Still negative	962(97.10)	304(98.40)	658(96.50)
Sero-converted (Positive)	28(2.80)	5(1.60)	23(3.40)
Still positive (Was positive before the test)	1(0.10)	0(0.00)	1(0.10)
Total	*991(100.0)*	*309(100.0)*	*682(100.0)*
Tested current study after previous HBTC			
Negative	731 (97.47)	234(99.2)	497(96.7)
Positive (Sero- converted)	18 (2.4)	2 (0.8)	16 (3.1)
Positive before testing	1(0.13)	0	1 (0.2)
Total	*750 (100)*	*236 (31.5)*	*504 (67.2)*
Overall HIV Test Results (Ever tested and never tested)			
Negative	1,181(96.60)	406(97.60)	775(96.20)
Positive	39(3.20)	8(1.90)	31(3.80)
Indeterminate	2(0.20)	2(0.50)	0(0.00)
Total	*1,222(100.0)*	*416(100.0)*	*806(100.0)*

4.6.4.1 Sexual behavior of those testing HIV positive following previous negative HIV result at HBTC (HIV sero -converters)

Sexual behavior of the HIV sero-converters following a reported previous HIV negative result is shown on table 4.15. Of the 28 participants testing HIV negative previously and who tested HIV positive in this study, the majority 23 (82%) had condom use demonstration. Of these, only 3 out of the 28 (15%) reported they had always used condoms in the previous 3 months. Out of the 16 who reported non-condom use, 11 participants (69%) reported they trusted their sexual partners and only 5 reported they did not trust their partners with one participant reporting that the partner had refused condom use.

Table 4.15: Use of prevention messages among the HIV sero-converters in the last 3 months

Prevention messages and behaviour	n	%
Tested with spouse		
Yes	1	4.50%
No	21	95.50%
Condom use demonstration?		
Yes	23	82.10%
No	5	17.90%
Offered condom after test		
Yes	6	21.40%
No	22	78.60%
Condoms use in the last 3 months?		
Always	3	15.80%
Sometimes	1	5.30%
Never	15	78.90%
Sex with spouse in last 3 months		
No	5	27.80%
Yes	13	72.20%
Partner refused condom use last sex		
No	15	93.80%
Yes	1	6.30%
No condom use last sex because trusted partner		
No	5	31.30%
Yes	11	68.80%
HBTC experience rating?		
Yes -Excellent	9	50.00%
Yes - Good	9	50.00%
Would you recommend HBCT?		
Yes	18	100.00%

`*Varying denominators due to missing values and non responses,
*No responses: Participants had a right not to respond

4.7 Uptake and utilization of care and treatment services following HBTC

4.7.1 Demographic characteristics of participants reporting HIV positive status.

A total of 25 individuals self-reported being HIV positive, 3 males and 22 females (Table 4.16). The median age was 35 years (IQR 26-72). The majority (75%) of the participants were aged 25-44 years, with (84%) being married, and had primary level of education (76 %), half of them (52%) were engaged in unskilled jobs and nearly half (48%) reported they were unemployed. Only 18 (72%) responded to the number of sexual partners question while the rest declined to respond to the question. Of those who responded, 93.3% reported one sexual partner in the previous 3 months and only 2 individuals reported they had more than one sexual partner in the previous 3 months.

Table 4.16: Socio-demographic characteristics of those reporting HIV positive status from previous HBTC

	n (%)
Gender	
Male	3(12.0)
Female	22(88.0)
Total	25(100)
Median age	35 (IQR=26-72)
Age in years	
25-34	10(40)
35-44	9(36)
45-54	4(16)
65+	2(8)
Total	25(100.0)
Occupation	
Non-formal	11(44.0)
Unskilled	13(52.0)
Skilled	1(4.0)
Total	25(100.0)
Education	
Primary	19(76.0)
Secondary	5(20.0)
Tertiary	1(4.0)
Total	25(100.0)
Marital status	
Married	21(84.0)
Widow/Widower	3(12)
Separated	1(4.0)
Total	25(100.0)
Sexual Partners	
one	16 (89%)
2+	2 (11%)
Total	18* (100%)

*7 paricipants declined to answer the question about their sexual partners

4.7.2 Uptake of care and treatment services and experiences at the clinics by those reporting HIV positive status.

The study sought to know the experiences and challenges that the residents faced as they sought HIV care and treatment services from the health facilities. Out of the 25 participants who reported they were diagnosed with HIV in the previous HBTC, only one had not accessed care and treatment services and he would not give any reasons why not. Three quarters of the HIV positive participants reported they were enrolled into care and treatment with no problems at the clinic. Majority (83.3%) of the participants reported the waiting time was right, staff were friendly (83.3%), helpful and gave useful information (66.7%). Only six participants; all of whom were women, reported they experienced challenges at the clinic, unfriendly staff was reported by 4 partcipants while another 4 reported that the information provided was not helpful (Table 4.17).

Table 4.17: Uptake of treatment services and related experiences from health facility after enrolment.

Experiences at the hospital/clinic	**Sex**		
	Male	Female	Total
	n(%)	n (%)	N (%)
HIV status results (N=25)			
Positive	3(0.9)	22(3.1)	25(2.4)
Negative	314(99.1)	689(96.9)	1003*(97.6)
Gone to seek treatment at the clinic or hospital? (N=25)			
Yes	3(75)	21(100)	24(92.3)
No	1(25)	0	1(7.7)
Was enrolled with no problems (N=24)			
No	0(0)	6(28.6)	6(25)
Yes	3(100)	15(71.4)	18(75)
Waited for very long (N=24)			
No	3(100)	17(81)	20(83.3)
Yes	0(0)	4(19)	4(16.7)
Staff were unfriendly (N=24)			
No	2(66.7)	18(85.7)	20(83.3)
Yes	1(33.3)	3(14.3)	4(16.7)
Staff were helpful (N=24)			
No	2(66.7)	6(28.6)	8(33.3)
Yes	1(33.3)	15(71.4)	16(66.7)
Staff gave important information (N=24)			
No	2(66.7)	6(28.6)	8(33.3)
Yes	1(33.3)	15(71.4)	16(66.7)
Not given any information about the disease and treatment			
No	3(100)	21(100)	24(100)

***75 out of 1078 participants declined to share their HIV status results**

4.7.1.3 Uptake of care and treatment services, the qualitative responses

The participants in the FGDs had knowledge and mentioned by name all the facilities from where to obtain HIV care and treatment services in the settlement and its environs. Reported Decisions on how soon to seek treatment were reported to be dependent on several factors; how sick the person was, the distance to the nearest clinic, whether they had money or not for opening of files especially in government hospitals and whether they believed the results or not. Participants reported that individuals testing positive often went to seek a second opinion and re-testing to confirm the HIV results especially those who were not sick.

" *….after they confirm, they take too long to go for medicine, they wait until they see signs that's when they go to the doctor and say they were tested and found positive" (Male 31-50 years*).

The study participants were unanimous that HIV treatment was good and reported that when treatment is started late, then the results were not always good.

" *I saw my sister being told the same thing but she ignored because of pride, when she went, it was too late because the virus had started destroying her body so when she started taking the drugs it was a waste of time" (Male 31-50 years*)

The study participants reported that incentives like food and other donations given in some clinics are a motivator to seek treatment and this too determined the choice of the clinic to attend.

"Some places they give donations like milk, porridge flour and even food stuffs which make you happy" (Female 18-30 years)

Although participants were generally happy about the treatment and drugs they were given, they reported some actions from staff which they said discouraged PLHIV from

continuing with the clinic attendance, like rudeness, poor attitude and lack of concern from the staff. "*It is a form of stigma, you find even the way the person treats you inside his heart, treats you with disrespect like you are not important"* (Female 18-30 years). They also expressed that long queues and long waiting time occasioned by patient's files taking too long to be retrieved taken to be retrieved were major limiting factors. Others reported that treatment is not initiated immediately and patients are not given reasons why and they interpreted this as being denied tretament and attributed it to lack the money they are required to pay.

"There are those who ask for permission from their place of work for a short time to pick drugs and only to find staff chatting or taking tea and they tell you they did not send you to get HIV……"(Male 31-50years)

'They talk so much about going for treatment and when you go, you are turned down sometimes because of money for opening the file and other drugs

The study participants reported that during the adherence counseling, patients are often rebuked by the health providers if they did not keep the clinic appointment as required by the health facility.

"They wanted to cancel treatment because they said we had to commit ourselves, she committed by signing and may be a person forgets to take medicine because they are sick" (Male 31-50 years).

CHAPTER FIVE

DISCUSSION

5.1 Factors associated with uptake of HBTC in Kibera informal settlements

This study found high uptake of HBTC, 85.9% reported previous uptake and 99% HBTC uptake in this study. The factors associated with uptake of HBTC in Kibera informal settlements are age, marital status, occupation and education (P=0.004, P<0.001, P=0.026, P<0.001 respectively) were significantly associated with uptake of testing and counseling and previous testing.). This uptake is higher than the nationally representative study by Nganga *et al*. (2014) that found that 72% of Kenyans had ever tested for HIV. Lower testing uptake (62% among females and (31%) among males) was reported by Zirabaa *et al.,* (2011) in Viwandani and Korogocho informal settlements in Nairobi. Dalal *et al*., (2013) reported HBTC uptake of 76% in a limited sample in two villages of Kibera informal settlement.

The findings from this study show more females had tested for HIV, these findings are similar with reported findings from elsewhere (Medley *et al*., 2013; Lindegren *et al.,* 2012; Kyaddondo *et al.,* 2012). In a study among health workers in Burkina Faso, Kirakoya-Simadoulougou (2013), reported more men testing but in VCT settings.

The majority of males who reported ever receiving the HIV test did so in hospitals and in their homes as opposed to testing in VCT centers as reported in literature (Sherr *et al*., 2007). This underscores the need to intensifying PITC in health facilities while also utilizing HBTC in order to reach men with HTC services.

There were significant differences in HBTC uptake between males and females where the latter were more likely to have tested for HIV in HBTC than the former. This finding differs from earlier reports and beliefs that women have a higher testing uptake than men because of their frequent contact with health facilities and access to PMTCT

(Lindegren *et al.,* 2012; Medley *et al.,* 2013). This may be because a lot more women stay at home while men go out to seek employment and income for the family. The study showed a higher number of individuals in this community had tested in health facilities and through HBTC compared to other testing modalities namely VCT mobile HTC and workplaces.

Primary level or non formal education were positively associated with uptake of HTC and although this finding is the same as those of Ziraba *et al.*, (2011) it departs from the previously reported association of uptake of HTC with higher educational levels (Hutchison *et al*., 2006). The finding could be due to the generally low levels of education in the informal settlements where most individuals fall in the category of primary level of education or no formal education and so a possible confounder to this finding.

In this study, the highest number of individuals who accessed testing and counseling were aged 19-34 years. These findings aresimilar to with those of Ziraba *et al.,* (2011) who found the highest number of HIV testers between 20-34 years in Viwandani and Korogocho informal settlement in Nairobi.. Age is important factor in HIV prevention in Kenya. The National AIDS council of Kenya modeling report of 2016 puts adolescents and young people as contributing to 51% of new HIV infections in the country (NACC 2016). From a national survey, the HIV prevalence peaks at age 25-34 years. This is also the age of marriage and family formation among most people. The public health impact of early knowledge of HIV status in this age group is the opportunity of HIV prevention and treatment to stop HIV transmission among this vulnerable group.

Prior exposure to and experience with HBTC seems to and promoted uptake HIV testing. Residents test for HIV at any given opportunity to test as was reported in the FGDs. HBTC eliminated fear of testing and improved HTC service seeking behavior in this community. The Kibera HBTC strategy implemented from 2009-2011 involved community participation and use of constructs health belief model which encouraged

community conversations about HIV testing. Community conversation has been found to promote uptake of testing (Teklehaimanot *et al.,* 2016). Prior to HBTC there were low (67%) testing rates in this informal settlement (Dalal *et al.,* 2013). This study found high re-testing rates especially among those who had tested before who offered themselves for re- testing as and when an opportunity arose. These findings sare similar to those of South *et al.,* (2013) in a Tanzanian study that knowledge of HIV testing and previous experience increase uptake of HTC.

The need to confirm HIV status results, leads to re-testing many times as reported in the focus group discussions. On the other hand the need to re-test at any opportunity may be due to participants doubting the HIV results received, in view of the reported casual sex that is common in Kibera informal settlement. Such individuals expected different results from what they received from one testing point. It has been reported in literature that unless the HIV test result is different from what the individual expected, receiving a negative HIV result after a risk exposure reinforces low risk perception and the continued engagement in high risk sexual behaviors (Denison *et al.,* 2008; Gong, 2014) and hence repeated HIV testing.

HBTC increased and promoted the uptake of testing services in this community; resulting in high uptake of testing services during this study with all the participants who reported HIV negative status or did not know their HIV status accepting to take the HIV test. These findings imply that HBTC is beneficial in promoting acces to HIV testing services among the residents of Kibera informal settlements. Uptake of HIV testing services is the entry point to knowledge of HIV status and is the gateway to HIV prevention care and treatment. This has an implication in the attainment of the first 90 of the UNAIDS goal of 90-90-90 startegy where the first is the diagnosis of 90% of those HIV infected to know their HIV status

5.2 Experiences associated with couple and partner HIV testing in the HBTC.

This study found (i) fear of HIV discordancy among couples (ii) associated fear of marriage break up after diagnosis of HIV diacordancy, (iii) absence of men from home and (iv) men assuming their wives HIV status as barriers experienced by couples to couple HIV testing. The proportion of individuals testing as couples in HBTC dropped from 33.9% in the testing period of 2009-2011 to 19.6% in this study. This finding is similar to a five year community cohort study examining trends in HTC in Uganda that found couples testing below 30% (Matovu *et al.*, 2013).

One of the aims of HBTC is to mitigate some of the barriers experienced by couples in accessing HTC together by taking services to their homes. Although the highest testers were married individuals, they tested singly but not as couples. Couple testing remains a priority in diagnosing HIV discordant partners, promoting support and mutual understanding in the event that one partner needs HIV treatment. Being female, aged 19-24 with no occupation but with more than one sexual partner were less likely to test as couples in subsequent opportunity to test as couples.

HIV prevalence and incidence has been reported to be highest among adolescents and young women in Kenya who contributed 51% of the new infections in 2016 (NACC, 2016). This age group is associated with early stage of marital formation where most of the young women get married and this has implications on HIV transmission including mother to child transmission of HIV (MTCT) (Matovu *et al*, 2013). However this study demonstrated that couples testing improved with increasing age and was highest among those aged 35-44 years ($P < 0.001$).

In a nationally representative study in Kenya knowledge of HIV infection status was found to be low (14.9%) among married and cohabiting couples (Kaiser *et al*., 2011), thus increasing the risk of HIV transmission in unsuspecting partners. In the same study, 34.7% of HIV infected concordant couples, one partner had reported they were HIV

negative at a previous HIV test (Kaiser *et al.,* 2011) meaning they became infected later by their HIV infected partner. Lack of HIV couple testing affect HIV prevention efforts negatively as 80% of HIV infections occur in married couples in heterosexiual relationships (Gelmon *et al.,* 2009).

A community wide educational campaign on HIV discordancy among couples may help allay the fear of HIV discordancy and present it as a reality if implemented may promote residents' access to couple testing. Specific messaging about the need and benefits of couples testing and HIV couple discordancy should be intensified. The success of such intervention would also be beneficial in promoting condom use among couples.

Absence of men from home when service providers visited was found as a barrier to reaching men with HIV testing service in this study. HBTC was envisaged as a strategy that would promote couple testing and counseling since services are taken to the home (Matovu *et al*., 2013),. This is likely to remain a barrier especially in urban slums for a long time and more innovative strategies of providing the HTC services to couples in these settings are urgently needed. Strategies like encouraging men to accompany their wives to antenatal clinics by sending them a detailed invitation letters have been reported as successfu, (Byamugisha *et al*., 2011). Influential network agents approach (Wall *et al.,* 2012) can be adopted as in Rwanda and Zambia, to promote couple testing. Such astartegy s could be piloted in the informal settlements to assess its feasibility in increasing couple testing beyond offering HBTC. Index client follow up testing by appointment, is a strategy that may prove beneficial in reaching men with HIV testing services and may offer a good opportunity to diagnose HIV discordancy among couples.

This study found that men often assumed their wives' HIV status and did not therefore see the need to test for HIV themselves. This is evidence of low knowledge among men about HIV discordancy and calls for concerted education for a better understanding among them. Women especially those in the reproductive age have a higher chance of knowing their HIV status due to the "opt out approach" for HIV testing used in ante-

natal clinics and the integration of HIV services into maternal, neonatal and child health and family planning services (Lindegren *et al.,* 2012). Encouraging men to visit antenatal clinics with their wives or partners and offering education on HIV discordancy may promote couple testing for HIV and early diagnosis of HIV and initiation of ART.

5.3 Uptake and utilization of HIV preventive messages following HBTC

This study found high provision of HIV prevention messages in HBTC but low utilization of the messages received following HBTC among both those non HIV infected and those HIV infected persons. Nuwaha *et al*., (2012) in astudy in Uganda found that HBTC offers a convenient avenue of reaching clients who have low HIV risk perception and therefore would not seek services on their own, increases access to knowledge of HIV status and offers opportunity for provision of HIV prevention messages. However this study found that the HIV prevention messages received at HBTC are not used by both those HIV infected and the uninfected persons. .Low utilization of prevention messages found by this study are due to (i) low HIV risk perception, (ii) lack of condom uptake related to partner trust and suspicion of infidelity on the partner suggesting condom use and fear of children witnessing condom demonstration, (iii) inability of women to negotiate for safe sex and (iv) community sexual concurrency practices and misconceptions about condom use were barriers to utilization of prevention messages. The HIV prevalence of sero-conversion was 2.4% in those who tested in HBTC and 2.8% in those who reported ever testing regardless of place of testing (2.8%).

This study demonstrated that it is through HBTC that the highest proportion of prevention messages were received compared to other testing sites. Overall, there was high acceptability, appreciation and knowledge of the prevention messages received during HBTC. This could be attributable to the relaxed atmosphere in which HBTC is delivered, in the clients' home where they have control of the environment. However very low utilization of the messages for HIV prevention was established, with resultant

no change from risky sexual behaviors by both those HIV infected and those not infected.

New strategies are urgently needed to change both the mode of delivery of the prevention messages and the community perception of HIV risk, to promote behavior change. For example integrating prevention messages into settings where PLHIV receive medical care and addressing their health and behavior in totality has been found to yield success in achieving reduction in unprotected sex (Crepaz *et al*., 2006).

The study found low condom uptake and use among the study participants. Although condom demonstration was reportedly received by over 80% of the previous HBTC service recipients, only 25% of them had been offered condoms with just 2% of them accepting the offer. Refusal to take condoms has been associated with stigma (Chandran *et al.,* 2012). In this study, several factors that promoted refusal to receive condoms during HBTC emerged, among them; sexual partner trust, fear of being seen by children taking condoms and community perceptions and attitudes towards condom use where the use of condoms is associated with infidelity. The stigma associated with condom use is also demonstrated by the reluctance of the participants to answer the question about reasons for non-use of condoms and HIV status disclosure where under half the participants responded to these questions.

The finding where regular condom use by about 11% of the participants in this community is much lower than the reported use in a nationally representative survey in Kenya of 36.7% (Mwangi *et al;* 2011) but similar to reports from Bushenyi district in Uganda of 15.6 %. (Nuwaha *et al;* 2010). While other studies reported reduced rates of unprotected sex among those living with HIV (Crepaz *et al.,* 2006; Bunnell *et al.,* 2008), this study found that use of condoms is only 15% among the PLHIV in Kibera informal settlement. Testing and provision of condoms is associated with 80% reduction in risky sexual behavior (Chandran *et al.,* 2012) and so demonstration and provision of condoms is recommended in HBTC.

While the service providers should ensure they demonstrate condom use and offer the same to all clients, they should be sensitive about exposing children and should do the demonstration away from children in the household. Condom demonstration during all HIV testing service encounters may break the barriers surrounding its use (Mwangi *et al.,* 2011) just as testing for HIV has normalized in the Kibera community due to the massive community mobilization followed by HBTC yielding very high uptake of testing services (Oluoch *et al*., 2017).

Lack of condom use attributable to trust of the sexual partner found in this study is similar to findings from studies by (Pettifor *et al.,* (2011) in Soth Africa and Malawi where partner trust in long term relationships and the need to disclose HIV status to sexual partners were found to be additional barriers to condom use. Inability by women to negotiate safe sex practices was reported in this study. A study by Mwangi *et al.*, (2013) in Kenya found lack of women empowerment and ambivalence towards condom use to be a barrier to condom negotiation for safe sex practices.. This is partly due to the norm expectation of women to be sexually timid and submissive. Strategies targeting women to empower them to embrace and negotiate condom use would play a big role in HIV prevention in Kibera informal settlement.

A community wide public health campaign on condom use norm change is required to promote condom usein the informal settlement and specifically among the married individuals. Additionally, sensitivity is required in condom promotion and may include combination of strategies including making it freely available at designated community outlets where residents socialize especially in the alcohol serving venues and also explore provision at a minimal cost in the community outlets. The use of community based campaigns have been found to be effective in global efforts to control major public health threats and still represent a powerful strategy to deliver prevention strategies (Suthar *et al.,* 2012). These strategies if employed have the potential of reducing condom stigma and negative perceptions and beliefs about condom use. This study found that the majority of the participants reported no change from their HIV risky

sexual life since the last HBTC both from qualitative and related quantitative findings contrary to results from the individual interviews showing 93% of individuals had only one sexual partner. The FGDs unanimously reported multiple sexual partnerships in the community. This finding demonstrates some of the socially accepted answers provided and the limitation and biases associated with face to face interviews.

Participants who had tested in VCT and mobile outreaches had a marginally higher proportion of change from risky sexual behavior than those from HBTC. This could be due to the perceived risk that the individuals who voluntarily seek services have over those to whom services are offered in their homes or in hospital without a felt need. Being male, single with skilled jobs and never tested for HIV were significantly associated with multiple sexual partners.

The reported impact of HTC in the reduction of high risk behaviors is mixed with some studies reporting declines in multiple partnerships and reduction in unprotected sex (Arthur *et al.,* 2007; Nuwaha *et al.,* 2012; Mwangi *et al*., 2011), while other studies report no change in risky sexual behaviors unless the result is different from what the individual expected (Denison *et al.*, 2008; Gong, 2014). Receiving a negative HIV result after a risky sexual exposure reinforces low risk perception (Sherr *et al*., 2007).

Both HIV positive and negative participants in this study reported engaging in unprotected sexual behaviors while aware of the fact and thereafter those who are not HIV infected, seek HTC services. A study in Uganda among those infected with HIV found that there was positive change from risky sexual behavior only in the first six months after initiation of ART (Bunnell *et al.*, 2008). This could be a clear case of disinhibition where individuals do not take seriously the risk of HIV exposure and do not use protection in sexual activity. This is comparable to disinhibition previously reported in the male circumcision program in Uganda where individuals engaged in risky sexual behaviour after circumcision (Gray *et al.*, 2007). The disinhibition observed in this study could be due to the normalization of testing achieved through HBTC where

residents engage in unprotected sex and present themselves for HIV testing. Disinhibition is further reflected in the response where a participant shared that he added another wife and also had another girlfriend after testing HIV negative.

However clients who had tested lastly in VCT were more likely to use protection than those who tested in mobile outreaches and were more likely to reduce their sexual partners; this is because the VCT center clients seek testing by themselves arising from possible fear of exposure than those in HBTC where providers initiate the services.

The HIV prevalence following HBTC and in those ever tested regardless of the place of testing was nearly the same 2.4% and 2.8% respectively. HBTC does not therefore seem to offer added advantage in utilization of prevention messages to prevent acquisition of HIV. Although HBTC offers the best avenue for provision of prevention messages, not all prevention messages were delivered in equal importance. Only three prevention messages condom use, faithfulness and partner reduction were reported by over half of the participants. The rest of the messages; VMMC, STI and treatment messages had as low as 3.5% of participants reporting their delivery.

This study found that individuals falling in the moderate prevention messages provision index were the majority in reporting utilization of prevention messages. This was a unique finding in this study, suggesting that individuals with moderate levels of exposure to prevention messages in HBTC (as measured by the multiple correspondence analysis) are significantly associated with adoption safe sex practices compared to those with low and high levels of exposure to prevention messages (P=0.001). There is a possibility that those with low levels of exposure lack the necessary knowledge and those with high levels of exposure could be the individuals who retest for HIV at every opportunity expecting different results from what they receive and have r4eceived the messages over and over. They could also be having information fatigue hence the description in FGDs that the information provided is not new. Understanding the

specific local factors surrounding this phenomenon would be beneficial in shaping the information and services that are offered to this community.

This study found no change from risky sexual behaviors among HIV positive participants. The FGDs participants reported they knew of some residents who were HIV positive who continued in risky sexual behavior by having unprotected sex with multiple sexual partners and many HIV positive women who continued having babies. Similar findings were reported early in the HIV epidemic in the United States (Gray *et al*., 2007).

A significant barrier to HIV control is the low HIV risk perception by the participants demonstrated in this study. The same finding was reported earlier in a national survey in Kenya (KAIS, 2012), and by Bourne and Charles (2010). The situation is compounded with the permissive nature and social acceptability of having multiple and concurrent sexual relationships in the informal settlement as explained by participants in the focus group discussion sessions. Social tolerance of extramarital sex is a barrier to HIV prevention in this community as it is in many African societies (Lung Vu et *al.*, 2011). This explains the desire for frequent testing that the residents expressed at the FGDs that they should be given services after every 1-2 months, because ‘‘of the way we interact with one another and the situation we live in” this was in reference to casual sex among residents. In addition to community perceptions and practices, additional barriers to condom use are myths held by this community about condoms and their effect on sexual activity among those already HIV infected.

Repeated testing is not protective against HIV acquisition as it may have been misinterpreted by these participants. Increased sexual concurrency among males in Kenya following a recent HIV test has been reported before (Kabiru *et al.,* 2010).

Kibera informal settlement is characterized by low socio-economic status and high alcohol consumption, these two factors are commonly understood to be related to

permissive sexual acts, and with the former also being related to economic gains because of economic deprivation (Lung Vu *et al.,* 2011). These factors could be additional barriers to use of HIV prevention messages in this informal settlement worth mitigating. The national HIV prevalence in Kenya is 5.6% (KAIS 2012) but small group of people infected with HIV is capable of spreading the virus in a population (Amar *et al*., 2011) and this underscores the need for innovative ways of raising HIV risk perception among the population.

The majority of the participants who reported more than two sexual partners had received HBTC previously together with prevention messages and yet 60% did not know the HIV status of their sexual partners. The findings of this study showed that women were more likely to disclose their HIV status than men. Findings from a study in rural Western Kenya region indicated that men were more likely to disclose their HIV status than women (Medley *et al.,* 2013). Overrall the low levels (60%) of disclosure found by this study do not support reports by Mulogo *et al.,* (2012) that Home based testing and counseling is able to promote faithfulness and disclosure of HIV status to sexual partners.

This study found that HBTC accords the client the convenience and flexibility of continuing with their domestic chores as services are offered and this makes it acceptable. However, this may be a barrier as concentration and appreciation of prevention messages offered to the individuals is hampered by competing interests and could explain the need by service providers to hurry and finish quickly to let the client continue with their chores. However the participants in this study expressed satisfaction with HBTC services and appreciated the knowledge given to them and said they would not hesitate to recommend HBTC to their friends and relatives. This they attributed to the "friendliness of the service providers, convenience and confidentiality" accorded by HBTC as the client does not have to go to seek services away from home. A study in Uganda by Tumwesigye *et al.,* (2010) reported the same desired attributes of service providers as being able to handle clients well, talk nicely and offer good explanations.

This study found that the introduction of HBTC in Kibera has drastically reduced stigma which has been thought to be a barrier to access to HTC services and increased HTC services seeking behavior by residents. The study found overwhelming support for testing services as 99% of the participants reported the services as excellent and good and would recommend to their friends and from the focus group discussions the participants reported encouraging each other to test in groups and those HIV infected shared their treatment information with others to encourage them to seek HTC services as well. Sobell and Sobell (2008) reported the possibility of HTC escalating widespread stigma. However lack of confidentiality by service providers who hold conversations while out in the streets was cited by some participants.

The major findings of this study that prevention messages delivered to clients are not used suggest that counseling skills should move from mere provision of knowledge to more thought provoking strategies like motivational interviewing (Sobell and Sobell (2008) as knowledge is appreciated but not used (Turk *et al.,* 2006). Combination of strategies (Amar *et al.,* 2011) of delivering HIV prevention messages based on a client's circumstances should be considered. The use of HBM was successful in creating demand for HTC in this setting; the same could be used but focusing on creating demand for adoption and use of HIV prevention strategies.

5.4 Uptake and challenges associated with utilization of treatment services by individuals who are HIV infected

This study found high (96%) uptake of care and treatment services by those diagnosed with HIV in this informal settlement without the use of incentives nor follow up to do so. Findings by Nsigaye *et al.,* (2009) in Northrn Tanzania reported the use of incentives to encourage access to treatment services. In a systemic review, Sabapathy *et al.*, (2012) reported HBTC was useful in early diagnosis of HIV and linkage to care and treatment. In a study in Western Kenya by Wachira *et al*., (2012), HBTC was found to be effective in getting HIV infected individuals enrolled into HIV care before they became ill, had

less complaints, were stronger and had a higher CD4 count. However in the Gambia, (Togun *et al., 2011*) found high mortality among the pre- treatment individuals who also had very low CD4 counts. Two studies in western Kenya (Wachira *et al.,* 2012; Kabiru *et al.,* 2010) reported an average of 26 days from HIV diagnosis to access of care and treatment services.

Although there was high uptake of the care and treatment services, participants cited very many challenges that they faced in doing so, that affect utilization and retention in the services. The challenges included (i) lack of same day initiation of ART; (ii) long waiting time which they attributed to lack of regard by health workers exhibited by their actions, (ii) poor communication and poor provider-client relationships and (iv) the manner in which adhreance counseling was done.

Lack of same day initiation was related to the clinic processes preceding intiation of treatment upon diagnosis of HIV. The essential steps in the HIV care pathway for HIV positive individuals include (i) HIV testing and linkage to care and treatment through referral, (ii) assessment of eligibility to initiate ART including identifying a treatment supporter and disclosure of HIV status, (iii) enrollment into pre ART care, (this step has been dropped by the test and treat strategy introduced in 2016 (NASCOP 2016), (iv) initiation into ART and long term retention in ART. At the time the study was done, between testing and initiation of ARV treatment, the client was initiated on care comprising of the prescription of Co-trimoxazole to prevent opportunistic infections while he undergoes clinical assessment and evaluation for ART preparedness. These steps seemed poorly understood by participants and were misinterpreted as being denied treatment at the first visit. Failure to initiate ART with subsequent loss to follow up of up to 40% has also been found to be associated with difficulty in disclosing HIV status to significant others (Shahstri *et al*., 2013; Togun *et al*., 2011).

The test and start strategy adopted in the ART treatment guidelines recently released by the government of Kenya (NASCOP 2016) where all clients testing HIV positive should be started on ART immediately upon diagnosis will go a long way in alleviating this challenge of misinterpretation of being denied treatment.

Participants viewed the provider actions towards clients in the health facilities as demeaning and not client centered and these were cited as impediments to service uptake and retention. There was also lack of professional etiquette and preparedness. Participants felt that clients were not valued by health workers who would keep them waiting while "just chatting or taking tea" and they felt they were looked down upon. Partcipants were unhappy with health workers whom they accused of using derogatory statements like "they were not sent to get HIV". The HIV positive client's self-esteem is already eroded (Mwai *et al.,* 2013) and requires warmth and empathy from service providers. The participants felt that the clients and the community were disrespected as they reported that the clients' pleas for prompt and quick services from health providers were not headed.

The study found that the process and manner of conduct of adherence counselingwas was a challenge experienced by those on ART. They considered it as rebuke, demeaning and punitive. In adherence counseling s a non- adherent client is required to show commitment to adhering to treatment by signing a document which is then filed in patients' records. Participants felt that clients are treated with disregard to their circumstances and are humiliated by being made to sign commitment letters to treatment. Although clients agree and sign contracts to conditions given to them in health facilities, a study by Achieng *et al.,* (2012) showed that compliance is only 40%.

The psychosocial stress that HIV positive clients go through make them quick at picking cues and perceiving health worker actions as stigmatizing, discriminatory and uncaring (Kuteesa *et al.,* 2012). The perceived or actual changed physical appearance, make HIV positive clients feel inadequate and are very sensitive to spoken and unspoken cues

which they perceive to be directed at them because of their HIV infection status. Therefore recognizing that adherence counseling is very important and should continue, the manner in which it is conducted should be reviewed to make it more supportive rather than punitive and degrading. Patient centered approach to care (Lauver *et al*., 2002) is a core element in achieving quality care for any individual and it is necessary to constantly review providers' competency and interpersonal skills. Patients who are satisfied with their care are more likely to follow treatment and have better health outcomes.

In this study, stigma was reported in the focus group discussions to be very minimal in Kibera informal settlement. The extent to which one would be stigmatized was unanimously reported by the focus group discussions to be dependent on the way one conducted oneself. The openness was attributed to HBTC in the informal settlement. Likewise a study in Western Kenya reported only 17% of study participants cited fear of being stigmatized (Medley *et al.,* 2013). This is different from the results from a South African cluster randomized study on HBTC which reported moderately high levels of stigma (Doherty *et al.*, 2013) despite the area having one of the first treatment centers.

5.5. Limitations of the study:

The study relied on self-reports and therefore prone to desirability of responses.

Considerable time had elapsed from the last HBTC and so responses could have been affected by recall bias.

Participants had re-tested several other times following the HBTC in Kibera and so there may have been a mix up in the responses pertaining to place of last test versus HBTC in regard to utilization of prevention messages received.

Participants were at liberty not to answer questions they were not comfortable answering as required by the ethical standards and this made the denominators change from variable to variable.

Some of the limitations of the study were overcomed by;

The study used mixed methods to overcome the limitation of recall bias and social desirability of responses so as to triangulate the data for better results.To overcome the effects of changing variables on overall results, proportions and percentages were calculated for each variable as opposed to the total number.

Despite the limitations cited above there were many strengths of this study with valuable findings which would shape program delivery and which out way the limitations:

5.6 Conclusions

The findings of this study revealed that

1. There is high uptake of HBTC in Kibera informal settlement and the factors associated with uptake were; gender, age, marital status, educational level, and previous testing experience.
2. Home based testing and counseling (HBTC) did not promote couple testing as couples experienced fear of diagnosis of HIV discordancy, besides men were not found at home and this hinderd uptake of couple testing.
3. Home based testing and counseling (HBTC) promoted delivery of HIV prevention messages better than delivery in other testing sites namely hospitals, VCT, mobile and workplace, however these messages are not used for HIV prevention by the recipients.
4. HBTC is an effective strategy of diagnosing HIV infection early and linking individuals to care and treatment, however interpersonal and communication barriers between providers and clients affect retention on treatment.

5.7 Recommendations

1. The Ministry of Health through NASCOP should consider reviewing the HIV testing protocols and incorporate psychosocial approaches in counseling and service provision for increased uptake as observed in Kibera informal settlement
2. The Ministry of Health should come up with innovative strategies of reaching men and couples with testing services like establishing male only clinics with flexible and hours and encourage men to accompany their wives to the ante natal clinics.
3. There is need for the National Aids control council to revamp multisectoral startegies and campaigns to pronmote the uptake and utilization of HIV prevention messages for example continuous delivery of prevention messages using appropriate channels, targeted condom use campaigns and messaging, correct teaching about HIV discordancy and women empowerment to be able to negotiate safe sex practices in the informal settlement
4. There is need for NASCOP to enforce ongoing programs for continuous capacity building for service providers to help them cultivate healthy interpersonal relations and positive attitudes towards clients and better communication.

5.8 Scope for further research

There is need for further research to

To identify the factors that hinder men from accessing HIV testing services and recommend nitigation startegies to increase of HIVtesting among men and couples.

Conduct implementation science work on delivery of HIV prevention messages that promote utilization of HIV prevention.

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APPENDICES

Appendix 1: Individual face to face questionaire

Individual Questionnaire for Home Based Testing and Counseling.

The answers provided here will not be shared by unauthorized persons. We undertake to maintain confidentiality with the information you provide us with. If you feel you cannot answer certain questions, it is right for you to decline. However we shall appreciate to get all the answers from you. There is no known harm associated with participation in this survey. Participation in this program is voluntary and declining will not deny you services.

Note to Interviewer

If individuals present as a couple, each respondent will have their own form filled.

Section 1. Demographic Information

1. What is your name? (Optional)----------
2. Sex: 1. Female; 2. Male (Tick one)
3. What is your date of birth?----------
4. Are you employed? 1 Yes; 2. No
5. What is your occupation: ……
6. Level of Education
   1. No Formal 2. Primary 3.Secondary 3.Tertiary **(Tick one)**
7. Marital Status: 1. Single 2. Married Monogamous 3.Married Polygamous 4.Widowed 5.Divorced /separated 6. Widowed remarried

/ monogamous 7. widowed remarried polygamous , 8.cohabiting (**Tick one)**

Section 11. Knowledge and utilization of HIV Prevention messages

8. Have you had sex in the last 3 months? 1. Yes; 2. No (***If no skip to Q 16)***

9. How many sexual partners have you had in the last 3 months.----------

10. What type of sexual partner is she/he: 1.Spouse; 2. Regular partner; 3.Casual partner; 4. Not sure

11. Is this partner new 1.Yes; 2.No

12. Have you used condoms in the last 3 months? 1. Always; 2. Sometimes; 3.Never; 4. Don't know.

13. **If Not always**, why didn't you use condoms at the last sexual act?

    1. Partner refused,
    2. Did not have
    3. Trusted partner/ husband /wife
    4. Don't like them
    5. Don't know
    6. Did not think about it
    7. **Other (state)**

14. Have you ever had a demonstration on how to use the condoms? 1 Yes; 2. No

15. Have you heard of PMTCT services 1. Yes; 2. No

16. Where did you hear about PMTCT services?.....

17. Have you had a baby since the last HBTC experience 1. Yes ; 2 No.

18. Did you access PMTCT services? 1 Yes; 2. No

(Questions 19-21For Females only)

19. Are you pregnant now? 1. Yes; 2. No; 3. Not Sure

If pregnant skip to question 21

20. Are you using any FP method? 1. Condom 2. Injection, 3. Pill 4. Norplant 4. Natural method

21. Have you heard about Voluntary Medical Circumcision? 1. Yes; 2. No

22. If Yes when---------- (date) and where ----------(place)

23. How did you learn about voluntary male circumcision? From 1. Friend; 2. Radio; 3. HBTC; 4. Other----------(specify)

For males only

24. Have you been circumcised 1. Yes 2. No

Section 111: History of HIV testing and Counseling

25. Have you ever tested for HIV? 1. Yes ; 2. No (tick one)

26. ***If yes*****,** Where were last you tested for HIV? 1.Hospital; 2.Home; 3.Mobile; 4.Workplace ;5.VCT centre

27. When were you last tested for HIV? Year month

28. Were you tested in the Kibera Home based Testing and counseling program (HBTC)? 1. Yes; 2. No3**.** Tested elsewhere***If No skip to Q 32***

29. How would you rate the HBTC experience?

1. Excellent,
2. Good
3. Fair,
4. Poor

30. What messages were given when you were tested at home? (? LIST all that apply)

1. About Condom use
2. About being faithful to one uninfected partner
3. About reducing sexual partners
4. About PMTCT
5. VMMC
6. STI treatment
7. FP
8. Going to enroll for treatment

31. Would you recommend HBTC to your friend or relative? 1.Yes ; 2.No

32. Why did you not test during the last HBTC program?

1. Feared results
2. Partner/husband /wife was not in
3. I am not at risk of HIV infection
4. Was still thinking about it
5. Feared the procedure
6. Did not have money
7. **Other (state answer)**

If client has been tested for HIV ask the following questions

33. Do you know your HIV status? 1. Yes ; 2. No (circle one)

34. What was the test result? 1. Positive, 2. Negative

35. Were you offered Condoms after the HIV test? 1. Yes 2. No (Tick) one

36. If not offered condoms, why not?

1. Out of stock
2. Did not need them
3. Will buy his/her own

4. Don't know

37. Do you know your partner's HIV status? 1. Yes 2. No (Tick one)

38. Were you tested and received results for HIV together with your husband/wife /partner? 1. Yes 2. No (Tick one)

If client has not tested and received results for HIV together with wife husband/ partner

39. Have you disclosed your test results to your sexual partner or husband /wife/partner? 1. Yes; 2. No (Tick one)

40. ***If Yes,*** How long after the test did you disclose?----------

41. Were you assisted to do so by anybody? 1. Yes; 2. No

42. ***If Yes***- Who assisted you?----------

43. How would you describe your behavior before testing for HIV? List down responses

_____

_____

_____

_____

_____

44. Since learning of your HIV status what has changed in your life

1. Stopped drinking
2. Stopped casual sex
3. Reduced sexual partners
4. Started using protection while having sex
5. Nothing has changed

Section 1V: Referral and treatment seeking behavior

Ask the following questions if client tested positive for HIV at the last episode of HBTC

45. Were you told about availability of treatment when you received testing and counseling? 1 Yes; 2. No

46. Were you referred to a clinic or hospital for treatment and care? 1. Yes; 2. No

47. Have gone to seek treatment at the clinic or hospital? 1. Yes; 2. No

If client has not gone for treatment skip to question 55

48. How long did it take you before you went to seek treatment after learning of your HIV status

Days Weeks Months Year

49. What treatment were you given? ***(Record the names)***----------

---

50. Are you still taking the treatment? 1. Yes; 2. No

(Ask to be shown the treatment and note down the names)

51. Are you still attending the clinic/hospital? 1.Yes; 2.No

52. What was your experience at the clinic/hospital where you went to seek treatment?

1. Was enrolled with no problems
2. Waited for very long
3. Staff were unfriendly
4. Staffs were very friendly and helpful
5. Staff gave important information
6. Not given any information about the disease and treatment

53. Would you recommend or encourage your friend or relative to seek treatment from there? 1. Yes; 2. No

54. In your opinion are there barriers or problems faced by HIV positive people that hinder them from seeking treatment?

1. Stigma
2. Facility too far
3. Drugs too expensive
4. Cannot manage to take drugs everyday
5. Spouse will find out
6. Nobody to support me
7. Do not have the food to eat
8. Hospital staff are harsh
9. Feeling well
10. Fear of unknown
11. Do not believe results
12. Have to go to work everyday

If participant has not sought treatment ask the following question

55. What reasons do you have for not seeking medical assistance since learning of your HIV status? *Check all that apply*

1. Not ready to go
2. Spouse will find out
3. Fear
4. I feel strong and ok
5. Too far
6. No time/too busy
7. I fear medical staff
8. Don't believe the results
9. I don't have money to buy
10. Others Specify

56. What help or support would you recommend facilitating those testing HIV positive to access treatment immediately after the test?

_____

_____

_____

_____

_____

Section V. Testing and counseling for HIV today if the client is not HUV positive

57. Would you wish to be tested for HIV today (if tested more than one year ago?) 1. Yes 2. No

If client declines testing for HIV, ask the following questions

58. What are your reasons for not taking the HIV test today?

1. My partner is not in
2. I already know my status
3. I am afraid of the results
4. I will test with my husband /wife
5. The procedure is painful
6. Others will find out my status
7. I cannot get HIV
8. I am too old to get HIV
9. My Spouse will not like it
10. Prefer to test away from home
11. Will test later

If client wishes to be tested today, ask the following question

59. What are your reasons for wanting to take the HIV test today? (Tick all that apply)

1. Because you are here with me and recommend

2. Just reunited with my partner/wife/husband
3. I suspect my partner / husband /wife has other friends
4. Child ‘s mother died recently of unknown diseases
5. Want to get married
6. I cannot go to VCT centre
7. I feel sick all the time
8. Want to confirm my previous test results

60. Type of HIV testing and counseling done today for the respondent (tick one)

Tested as a

1. Couple
2. An individual
3. Polygamous
4. Family

61. Record the HIV Test results today

1. Individual 1.Positive 2.Negative
2. Family member (s) 1. Positive; 2. Negative
3. Partner/wife/husband: 1.Positive; 2.Negative

62. Has the client received his/her test results? 1.Yes; 2.No

63. Results received: (Tick one)

1. Individually
2. As a couple
3. As a family

64. If tested as a couple: 1.Concordant Positive 2. Concordant Negative 3.Discordant (Tick One)

65. If married and not tested as a couple what is the reason?

1. Partner away
2. Both made the decision not to
3. The partner refused

4. Would not like husband/wife/partner to know

For those testing HIV negative ask this question.

66. What recommendations do you have to help those testing HIV negative maintain their negative status?

_____

_____

_____

_____

Ask all clients this question

67. Are there any other issues you would like to share or questions you would like to ask? (Record the response)

_____

_____

Thank you very much for participating in the study. All information will be treated confidentially.

Appendix 2: Qualitative Focus Group Discussion Guide

Target Audience

Residents of Kibera who were resident at the time of last testing and counseling episode over 1 year ago.

Section 1: Introduction

Thank you for coming. Your participation in this discussion is by your free will and you will not suffer anything should you choose to withdraw. To show your free choice and voluntary willingness to participate in the discussion, I will request each one of you to sign a consent form. I will explain about the study to you.

**Explanation about the study followed by individual signing of the consent for participation.

We shall then introduce ourselves

My name is…… and I am part of the team conducting this study and offering HIV testing and counseling services.

The participants to give name and village of residence

Section 2: Knowledge about HIV testing and counseling

1. **What do you know about HIV testing? (Have you heard about HIV testing and where did you hear about it)**

Probe

- What are the places where HIV testing is offered? (Where can you get an HIV test?)
- How much does an HIV test cost?

- Have you heard about HBTC, tell us more about it
- Do you know of other areas where one can get tested for HIV? apart from the home
- Is one forced to have an HIV test?

Section 3: HIV Testing and counseling experience

2. Have you been tested for HIV before? (We are not interested in knowing your test results in this forum)

Probe

- When was testing carried out in this village?
- How often should people generally test?
- What makes people test many times several times?
- Have you also had home testing for HIV?

3. Were you tested alone or together with somebody?

4. How did you learn about HBTC? Tell us why you accepted to have the test in your house?

5. Is this your first time to get tested for HIV? Why had you not gone to have testing and counseling before that time?

6. What would you say are the differences between testing at home and testing in other places not home?

Section 4: Let us talk about the conversation that one holds with the provider during HBTC.

7. **What messages of HIV prevention do the providers talk about when in your homes?**

Probe

- What do they normally tell you during the HBTC (generally)
- Do they give you any new information .Share with us what they tell you.
- How do you use this information? Is it useful information? Is it helpful?
- What are some of the good things that providers do as they visit the villages?
- What things would you like them to change

Section 5: Benefits of HIV Testing and counseling

8. **Why is it necessary for one to take an HIV test? Are there any benefits for knowing ones HIV status?**

Probe

- Do your village leaders encourage you to know your HIV status?
- There are people who have not tested, what do you think should be done to encourage them to test?
- Is HBTC beneficial? How?

Section 6: Uptake of referral to treatment services

9. Do people find it easy to go for treatment after being referred?

Probe

- How soon after testing for HIV do people go to seek for HIV treatment?
- What makes people delay or not go for HIV treatment?
- Do you know the places where one can go to receive treatment if they test HIV positive
- What have you heard people say are the challenges of going for treatment at the places they are referred to? What is your own belief?

Section 7: Behaviour change

9. 10. What would you say about the behavior of people who have been tested for HIV?

Probe

- Do you think they change their behavior or continue with previous behavior?
- What behaviours are these that they change and what don't they change?
- Do people finds it easy to follow what the providers recommend
- What are the peoples attitude towards condom use

Section 8: Couple Testing

10. 11**. Is it a good idea to have couples take the HIV test together?**

Probe

- What are the good things about testing together with your wife or husband?

- What don't you like about it. Would you recommend to your friend or relative to test together with the wife / husband
- What things do you recommend for improvement of couple HIV testing uptake

Section 9: Stigma

11. Do you think it is a problem if ones neighbors know that one has HIV?

Probe

- Do people still want to hide their HIV status?
- What are some of the behaviours that show that there is a problem
- What are some of the behaviours that show acceptance of neighbours?
- Does one mix with people freely as before?

THANK YOU ALL VERY MUCH.

Appendix 3: Consent form for the home-based hiv testing of adults and mature minors (13-17 years old)

Good morning/ Good afternoon my name is ----------. I wish to provide you with information for purposes of gaining your consent to participate in this study.

Purpose of the Study

As a resident of Kibera we are offering you a chance to know your HIV status in your home. We also want to ask you questions about your previous testing and the actions you have taken since then to remain either negative or to live positively with HIV. This saves you the time, money and trouble of going to a VCT or hospital to be tested for HIV and is more private. We are offering this test to all residents of this village. It is the government's policy to offer free HIV testing services and wish that all citizens know their HIV status in order to be started on care and treatment for HIV f found HIV positive or if negative to stay HIV negative.

Description of the Study

We will conduct HIV testing for you if you accept to be tested and use the same tests that the Ministry of Health advises. Little amount of blood will be obtained from you by a finger prick using sterile lancet which is not painful but may be uncomfortable at the time of the prick. This will be tested and will take 15 minutes and the results will be out. If the first test is positive we shall do a confirmatory test using a second but different kit. We will offer you the chance to be tested with your partner. You have a right to decline the test but will not suffer any loss.

We will ask all persons a few questions, similar to those asked at the VCT center. These questions are about your age, some of your behaviors prior to HIV testing and after HIV testing if at all you have tested before. These questions don't take long and will help us

in counseling you and providing you with relevant information also. We shall analyze all the responses we obtain and these will help us strengthen the HBTC program for the clients' benefit. Your name will not appear on the analyzed information and it will be impossible to identify information relevant to you as a person.

Risks/Discomforts

You may feel a slight sting (like a pin prick) when we prick your finger to take blood. The stick we use is clean, and the small amount of blood we take will not harm you. You may have a small amount of bleeding from the prick site briefly. Also, the results of your HIV test may make you upset or sad but we will be available to so that you discuss any concerns. There could be a minor invasion to your privacy when sensitive questions are being asked. You may choose not to answer any questions that you are not comfortable with.

Potential Benefits

You will learn your HIV status right in your home and therefore no need to travel to a VCT centre or hospital. If you are HIV positive we shall refer you to a clinic or hospital of your choice so that you are started on care and treatment with drugs for HIV and we shall also explain to you how to live positively. If you are HIV negative we shall equally explain and offer you education and counseling on steps to take to remain HIV negative.

<u>A negative test means you do not have HIV. A positive result means you have HIV</u>

The testing and counseling today will take about 30 minutes. If you are a woman who tests positive and you have children less than 13 years of age, we will offer them HIV testing as well if you give consent, since HIV can pass from a mother to her child. However this information will not be included in the analysis of this study.

***Alternatives to being HIV tested today**:*

You may choose to be tested for HIV, or you may refuse at this time. It is your choice. You may have been tested before and there is no need to test again but we shall still ask you a few questions.

***Confidentiality*:**

What we talk about and your test results will be kept as private as possible, even among your family members as you choose. We will keep the records using numbers, not names. We will keep the records in secure files at KEMRI/CDC. However, you are encouraged to share the results and records with other people, like the doctors who will give appropriate medical care to you. Your name or other things that may identify you will not appear when we discuss this project.

Participation

Your participation in this study is completely voluntary. You are free to choose whether or not to participate in this study. You are also free to withdraw from the study at any time you wish to do so.

Persons to contact:

If you have any questions or problems related to the project that you want to talk about, you are free to contact the Principal Investigator, Rose Patricia Oluoch at Cell 0722204563 any time.

If you want to talk to someone else who is not part of this research project, you can contact the Secretary or Chairman of the KEMRI Ethics Review Committee, PO Box 54840 00200, Nairobi, Tel: 020 2722541, 0722205901, 0733400003; Email address: erc-secretariat@kemri.org.

Signed informed Consent

The HIV test has been explained to me. I have had a chance to ask questions and I feel that all my questions have been answered. I know that this HIV test and participation in the study is my choice. I have received a copy of this consent form. I agree to allow myself to be tested for HIV or give results of a HIV test done previously and to be interviewed.

Participant	**Name**----------	**Signature**----------	**Date**----------

(For those who are unable to sign their name, a thumb print will be taken and a witness must verify and sign below.)

I have read and explained the consent form to the person named above and watched them make their mark.

Signature of Person Obtaining the consent ----------
Date:----------

Appendix 4: Consent form for Focus Group Discussions

Good morning/ Good afternoon my name is ----------. My colleagues are ……I wish to provide you with information for purposes of gaining your consent to participate in this study.

Purpose of the Study

As a Kibera resident, you may have been offered a chance to know your HIV status in your home or you have had experiences with those who have received testing and counseling services. We want to ask you questions about your previous testing experiences and the actions you have taken since then to remain either negative or to live positively with HIV or the experiences you have encountered as far as HIV testing services are concerned as a Kibera resident.

This form tells you about the discussion procedure. If you participate in this discussion, you will be asked to sign an informed consent. You will get a copy to keep.

It is important you know that:

- Being in the focus group discussion is voluntary.
- You may decide not to take part in this discussion at any time without losing any benefits.

We invite you to take part in the focus discussion of Home Based Testing Services. The discussion will collect data to help improve the HIV prevention services. Please read this form and ask any questions you have.

Purpose

Home based testing and counseling services have been offered in Kibera in the recent past and for the last and three months. We would like to talk with you because you are a valued resident of this community and have knowledge about HIV risk factors, community experiences and health seeking behaviors. The experiences you share with us will help us improve on the services offered.

Procedures

We shall ask lead questions to the group and you are free to answer. This should take us about 2 hours. The questions will be about your experiences with HIV prevention. Some of the questions may appear personal. There will be questions about sexual practices and risky sexual behaviors. We will tape record your answers and someone will record what you say.

Confidentiality

We will assign you numbers at the beginning of the discussion and record what you say using those numbers to make the interview easier. You can also use a fake name so your real name will not be recorded. If you say something that might reveal who you are, *we shall* erase it from the audio tape. Trained staff will listen to your answers and write them down. The audio tape will be destroyed within two years. At that point, there will be no way to connect you with your answers.

We will keep your records as confidential as the law allows. We will keep all records in locked cabinets and on secured computers. Only the Principal investigator staff will have access to the records. There will be nothing identifying you in any reports. Your transcribed answers will be destroyed about 5 years after the end of the discussion.

Risks of being in the formative assessment

There is minimal risk involved with being in the focus group discussion. Some questions may cause you to feel uneasy. You may be embarrassed telling us your thoughts. You can skip any question(s) you don't want to answer.

Benefits of Participating

There are no direct benefits to you but as a member of the community later on. You will help us develop a program that may prevent the spread of HIV. We hope that this will benefit you and the community.

Compensation

We shall have refreshments after the discussion and transport reimbursement of Ksh. 200 compensation your time and effort.

Voluntary Participation, Refusal, and Withdrawal

Participating in this focus group discussion is voluntary. Your relationship with service providers from KEMRI/CDC will not be affected if you decide not to take part. You are free to stop the interview at any time with no penalty or loss of compensation for time and effort.

Contact Information and Question

If you have any questions or problems related to the project that you want to talk about, you are free to contact me at Rose Patricia Oluoch at Cell. 0722204563 any time.

If you want to talk to someone else who is not part of this research project, you can contact the Secretary or Chairman of the KEMRI Ethics Review Committee, PO Box

54840 00200, Nairobi, Tel: 020 2722541, 0722205901, 0733400003; Email address: erc-secretariat@kemri.org.

Statement of Consent with Research Staff Signature, Verification of Participant's Consent, and Date

Project staff has explained to me the purpose of the focus group discussion, what is required and the risks and benefits to the best of their ability. I have no further questions.

"*I've been told about the focus group discussion I will participate in the discussion among others. There are minimal risks from being in the focus group discussion. I've had time to think about the benefits. I know that I may decide not to join the focus group discussion and that I can stop at any time. All my questions have been answered.*

I will receive a signed copy of this consent form. I will only be able to be in this focus group discussion by telling the staff that I want to and signing below. I will not lose any rights or benefits that I might get if I do not join the formative assessment.

I now agree to give my consent to be in this focus group discussion

Participant	**Name----------**	**Signature----------**	**Date----------**
(For those who are unable to sign their name, a thumb print will be taken and a witness must verify and sign below.) I have read and explained the procedures and consent process to the person named above and watched them make their mark. **Signature of Person Obtaining the consent** ---------- Date:----------			

Appendix 5: Kiswahili translation of Consent Form

Habari za asubuhi / Habari ya jioni, Jina langu ni.....Ningependa kukupa habari kwa madhumuni ya kupata ruhusa yako ya kushiriki katika utafiti.

Umuhimu wa Utafiti.

Kama mkazi wa Kibera tunakupa nafasi ya kujua hali ya HIV katika boma yako au kama ushawai kuwa na uhusiano na wale ambao wamepata kupimwa na ushauri.Tungependa pia kuuliza maswali kuhusu kupimwa kwa hali yako hapo awali na vitendo ambazo umechukua tangu wakati huo kuishii bila virusi au kuishi vyema na virusi ya HIV au chochote kime tendeka amaumepata kulingana na kupimwa kwa HIV mtaani Kibera.

Fomu hii inakueleza kuhusu njia ya majadiliano.Ukishiriki kwa mjadala huu, utaulizwa kutia sahihii fomu ya maelezo.Utapata nakala yako ya kuweka.

Ni muhimu ufahamu kuwa

- Kushiriki katika mjadala huu ni kwa hiari yako.
- Unaweza kuamua kuto shiriki katika mjadala huu wakati wowote na uto poteza manufaa yoyote.

Umuhimu

Vipimo na Mawaidha nyumbani zimepeanwa Kibera hapo awali na pia kwa miezi mitatu iliyo pita.Tungependa kuongea na wewe kwa sababu wewe ni mkaazi muhimu wa jamii na una maarifa kuhusu hatari za HIV, na mienendo ya kiafya.

Taratibu

Tutauliza masawali ya mwelekeo kwa kikundi na una huru wa kujibu. Hii inafaa kuchukua mda wa dakika mbili tu. Maswali haya yatakuwa kuhusu za kujikinga kutokana na virus vya Ukimwi. Maswali mengine ya takuwa ya kibinafsi.Kutakuwa na

maswali juu ya ngono na hatari zake.Tuta rekodi majibu yako kwa kutumia mikanda na kuandika.

Siri

Mwanzo wa majadiliano tutakupa nambari ambayo itatumika katika rekodi na kurahisisha mjadala. Jina badia linaweza kutumika kuepuka kupeana jina lako kamili. Tutafuta chochote utakachosema na kukutambulisha kwa wengine kwa mikanda yetu. Watalaamu wetu watasikiza majibu yako na kuyaandika. Mikanda yetu ya kurekodi yataharibiwa baada ya miaka miwili kwa hivyo majibu hayataonekana kama yanahusiana na mhusika wa utafi huu.

Tutahifadhi na kulinda rekodi zetu kwa siri. Rekodi zote zitafungiwa na kulindwa kwa kabati na computer. Rekodi hizi zitatumika na watafitii walio na idhini pekee. Hakuna kitakachokutambulisha katika ripoti zozote. Majibu yaliyoandikwa yataharibiwa baada ya miaka mitano.

Hatari ya kushiriki

Kuna hadhari kidogo kwa kujiunga kwa kikundi. Maswali mengine yatakutia wasiwasi. ukitueleza maoni yako unaweza pata soni. Unaweza ruka swali lisilokupendeza.

Umuhimu wa kushiriki

Hakuna faida yoyote binafsi lakini baadaye kutakuwa na faida kwa jamii nzima kwa jumla. Utaweza kutusaidia kuwa na mradi itakayepunguza kusambaa kwa virusi vya HIV. Hii itakuwa ya manufaa kwako na jamii yote kwa jumla.

Fidia

Tutakuwa na vinyuaji/ viburudisho baada ya mazungumzo na pia Ksh.200 ya nauli kwa wahusika.

Kushiriki kwa ihari yako, kutoshiriki and kujitoa

Kushiriki katika mjadala huu wa vikundi ni kwa ihari yako. Uhisiano wako na watoaji huduma wa KEMRI/CDC hauta athiriwa uki amua kutoshiriki. Una aki ya kusimamisha mahojiano wakati wowote mbila adhabu au hasara yoyote kwa muda na juhudi ambazo zimetumiwa.

Mawasiliano

Ukiwa na swali yoyote ile kuhusu utafitii huu, tafadhali wasiliana nami Rose Patricia Oluoch nambari ya simu 0722 204 563 wakati wowote. Unaweza kuwasiliana na watafiti wengine ambao hawahusiki na utafiti huu, unaweza asiliana na Katibu au Kinara wa KEMRI Ethical Review Committee, Sanduku la Posta 54840-00200, Nairobi, simu: 020 2722541, 0722 205 901, 0733 400 003; barua pepe: erc-secretariat@kemri.org.

Mtafiti ameni eleza umuhimu wa kikundi cha majadiliano, kinacho itajika, hatari uwezo wao. Sina maswali mengine.

“Nimeelezwa juu ya kikundi cha majadiliano, nitahusika katika mjadala na mengine mengi.Kuna hatari ndogo sana kwa kuhusika katika mjadala. Nimekuwa na mda wa kufikiri juu ya manufaa. Ninaelewa ya kwamba ninao uamuzi wa kujiunga au kujiondoa katika kikundi cha majadiliano.Maswali yangu yote yamejibiwa.

Nitapata nakala yangu ya ridhaa hii. Nitamweleza mtafiti yakwamba nitausika katika mjadala na kwa kutia sahihi. Sitapoteza haki yangu na manufaa nisiposhiriki.

Nimekubali kujiunga na kikundi cha majadiliano.

Mhusika	Jina	Sahihi	Terehe

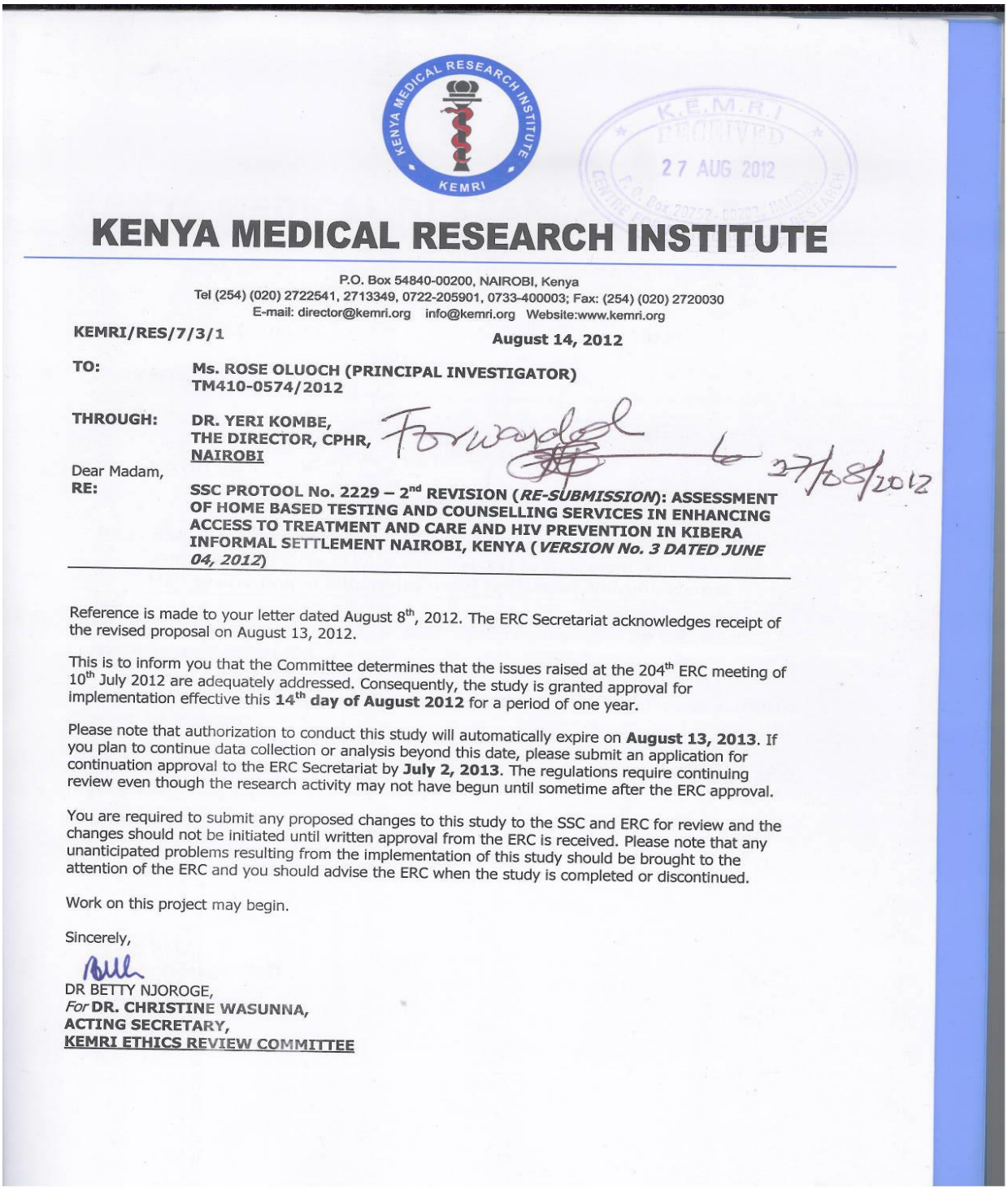
(wahusika wasioweza kutia sahihi wanaweza kutumia kidole chao cha gumba kutia sahihi na shahidi kudhibitisha na kutia sahihi hapo chini)

Nimesoma na kudhibitisha ridhaa hii kwa mhusika ambaye majina yake yapo hapo juu na kumshuhudia akitia kidole.

Sahihi ya mhusika ……. Tarehe ……..

Sahihi ya shahidi …… Tarehe ……..

Appendix 6: KEMRI Ethical Review Committee approval



KENYA MEDICAL RESEARCH INSTITUTE

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K.E.M.R.I RECEIVED 27 AUG 2012

KEMRI/RES/7/3/1 **August 14, 2012**

TO: **Ms. ROSE OLUOCH (PRINCIPAL INVESTIGATOR)**
TM410-0574/2012

THROUGH: **DR. YERI KOMBE,**
THE DIRECTOR, CPHR,
NAIROBI

Forwarded 27/08/2012

Dear Madam,

RE: **SSC PROTOOL No. 2229 – 2nd REVISION (*RE-SUBMISSION*): ASSESSMENT OF HOME BASED TESTING AND COUNSELLING SERVICES IN ENHANCING ACCESS TO TREATMENT AND CARE AND HIV PREVENTION IN KIBERA INFORMAL SETTLEMENT NAIROBI, KENYA (*VERSION No. 3 DATED JUNE 04, 2012*)**

Reference is made to your letter dated August 8th, 2012. The ERC Secretariat acknowledges receipt of the revised proposal on August 13, 2012.

This is to inform you that the Committee determines that the issues raised at the 204th ERC meeting of 10th July 2012 are adequately addressed. Consequently, the study is granted approval for implementation effective this **14th day of August 2012** for a period of one year.

Please note that authorization to conduct this study will automatically expire on **August 13, 2013**. If you plan to continue data collection or analysis beyond this date, please submit an application for continuation approval to the ERC Secretariat by **July 2, 2013**. The regulations require continuing review even though the research activity may not have begun until sometime after the ERC approval.

You are required to submit any proposed changes to this study to the SSC and ERC for review and the changes should not be initiated until written approval from the ERC is received. Please note that any unanticipated problems resulting from the implementation of this study should be brought to the attention of the ERC and you should advise the ERC when the study is completed or discontinued.

Work on this project may begin.

Sincerely,

DR BETTY NJOROGE,
For **DR. CHRISTINE WASUNNA,**
ACTING SECRETARY,
KEMRI ETHICS REVIEW COMMITTEE

Appendix 7: CDC Project Determination and Approval

CGH HSR Tracking #:

Request for Project Determination & Approval – Center for Global Health (CGH)

This form should be used to submit proposals to the CGH Office of the Associate Director for Science/Laboratory Science (ADS/ADLS) for research/nonresearch determination and requirements for IRB review/approval.
Approval Chain: Investigator → Branch Chief/Country Director →Division ADS → CGH Human Subjects Mailbox

☐ **New Request** ■ **Amendment** ☐ **Laboratory Submission**

Project Title: Home Based Testing and Counseling in Kibera Informal Settlements in Nairobi, Kenya		Project Location Country(ies): Kenya
CDC Principal Investigator(s): Patricia Oluoch MPH (SEV 12511)		
CDC Project Officer(s): Jennifer Galbraith (SEV 8807)	Division: DGHA	Telephone: 1254 2867000
Proposed Project Dates: Start: April 1, 2011	End: December 30, 2016	

Please check appropriate category and subcategory:

☑ **I. Activity is NOT human subjects research. Primary intent is public health practice or a disease control activity (Check one)**
- ☐ A. Epidemic or endemic disease control activity; if applicable, Epi-AID #
- ☐ B. Routine surveillance activity (e.g., disease, adverse events, injuries)
- ☐ C. Program evaluation activity
- ☑ D. Public health program activity*
- ☐ E. Laboratory proficiency testing

*e.g., service delivery; health education programs; social marketing campaigns; program monitoring; electronic database construction and/or support; development of patient registries; needs assessments; and demonstration projects intended to assess organizational needs, management, and human resource requirements for implementation.

☐ **II. Activity is research but does NOT involve human subjects (Check one)**
- ☐ A. Activity is research involving collection or analysis of data about health facilities or other organizations or units (NOT persons).
- ☐ B. Activity is research involving data or specimens from deceased persons.
- ☐ C. Activity is research involving unlinked or anonymous data or specimens collected for another purpose.
- ☐ D. Activity is research involving data or specimens from animal subjects.*

*Note: Approval by CDC Institutional Animal Care and Use Committee (IACUC) may be required.

☐ **III. Activity is research involving human subjects but CDC involvement does not constitute "engagement in human subject research." (Check one)**
- ☐ A. This project is funded under a grant/cooperative agreement/contract award mechanism. Award #
  ALL of the following 3 elements are required:
  - ☐ 1. CDC employees or agents will not intervene or interact with living individuals for research purposes.
  - ☐ 2. CDC employees or agents will not obtain individually identifiable private information.
  - ☐ 3. Supported institution must have a Federalwide Assurance (FWA) and project must be reviewed by a registered IRB linked to the supported institution's FWA.

Supported Institution/Entity Name:			
Supported Institution/Entity FWA #		FWA Expiration Date (mm/dd/yyyy):	
Expiration Date of IRB approval:		(Attach copy of the IRB approval letter)	

- ☐ B. CDC staff provide technical support that does not involve possession or analysis of identifiable data or interaction with participants from whom data are being collected (No current CDC funding).
- ☐ C. CDC staff are involved only in manuscript writing for a project that has closed. For the project, CDC staff did not interact with participants and were not involved with data collection (No current CDC funding).
- ☐ D. Activity is research involving linked data, but CDC non-disclosure form 0.1375B is signed.*

*Access to linked data is permitted under any of the above sub-categories if CDC investigators and the holder of the key linking the data to identifiable human subjects enter into an agreement using CDC form 0.1375B, prohibiting the release of the key to CDC investigators under any circumstances. The purposes of the planned research do not contradict the terms of consent under which the information or specimens were collected, whether that consent was documented or not documented.

☐ **IV. Activity is research involving human subjects that requires submission to CDC Human Research Protection Office (Check one)***
- ☐ A. Full Board Review (Use forms 0.1250, 0.1370-research partners)
- ☐ B. Expedited Review (Use same forms as A above)
- ☐ C. Exemption Request** (Use forms 0.1250X, 0.1370-research partners)
- ☐ D. Reliance**
  - ☐ 1. Request to allow CDC to rely on a non-CDC IRB (Use same forms as A above, plus 0.1371)
  - ☐ 2. Request to allow outside institution to rely on CDC IRB (Use same forms as A above, plus 0.1372)

*There are other types of requests not listed under category IV, e.g., continuation of existing protocol, amendment, incident reports
**Exemption and reliance request is approved by CDC Human Research Protection Office (HRPO)

CGH HS Form-12/28/2011 1

CGH HSR Tracking #:

Amendment: If this request is an amendment to an existing project determination. Please include a brief description of the substantive change or modification below and attach both clean and marked copies of the amended protocol or project outline.

This request is an amendment to the determination attached.
Rationale for request
1.Extension of time to cover 2012- 2016, allow for analysis of data, writing of papers and report and dissemination of results as was detailed in the purpose section of the previous request
2.To expand the objectives to below:
To explore the challenges associated with referrals and linkage to care and treatment services by clients who tested HIV positive in Kibera informal settlement.
To establish the utilization of HIV preventive messages by clients who previously tested HIV negative in Kibera informal settlement.

Submission: Attach a protocol or project description (See standard format below) in enough detail to justify the proposed category. Submit your request to your branch chief (or country director for DGHA country staff).

Approval Chain
Investigator → Branch Chief/Country Director →Division ADS → CGH Human Subjects Mailbox

CGH ADS/ADLS Review	**Date received in CGH ADS /ADLS office:**

☐ **Project does not require human subject research review beyond CGH at this time.**

☐ **Project constitutes human subject research that must be routed to CDC HRPO.**

Comments/Rationale for Determination:

Approvals/Signatures:	**Date:**	**Remarks:**
Patricia Oluoch Investigator	12/04/2012	
Jennifer Galbraith Branch Chief/Country Director	12/04/2012	Go SSO - Approved
Division Human Research Protection Coordinator Division ADS/ADLS or Director	~~12/04/2012~~ 1-25-13	Approved additional listed analyses. All data collection completed. No additional approvals required.
CGH Human Research Protection Coordinator CGH ADS/ADLS or Deputy ADS/ADLS	~~12/04/2012~~	

Note: Although CDC IRB review is not required for certain projects (categories I,II & III) approved under this determination, CDC investigators and project officers are expected to adhere to the highest ethical standards of conduct and to respect and protect to the extent possible the privacy, confidentiality, and autonomy of participants. All applicable country, state, and federal laws must be followed. Informed consent may be appropriate and should address all applicable elements of informed consent. CDC investigators should incorporate diverse perspectives that respect the values, beliefs, and cultures of the people in the country, state, and community in which they work.