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Do clients receiving Home based testing and counselling (HBTC) utilize the HIV prevention messages delivered? A study among residents in an urban informal settlement in Kenya who previously received HBTC.

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Summary

Background: Home based HIV testing and counseling (HBTC) increases access to services and is associated with high testing uptake. Alongside testing, individuals are offered HIV prevention messages with an aim of helping them reduce HIV high risk sexual behaviors. This study explored the level of provision and subsequent utilization of HIV prevention messages and associated change in behavior among individuals who had received HBTC previously in an informal settlement.

Methods: In a mixed method cross sectional study, we interviewed 1257 individuals and conducted 6 focus group discussions (FGD). Multiple correspondence analysis (MCA) was used to construct provision of prevention messages and behavior change indices using STATA 3.0. Pearson's chi-square statistics was used to test for bivariate association between the outcomes and logistic regression analysis was carried out with the behavior change index as the outcome of interest and the predictors considered significant ($p < 0.1$). Thematic content analysis for qualitative data was done using Atlas 3.0.

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Authors' Contribution

RPO conceived, designed and supervised the study, prepared the analysis plan, interpreted the data, wrote the manuscript, submitted the manuscript and gave approval for publication and is responsible for any queries arising thereof. TA did further cleaning and coding and designed the analysis instruments and analysed the data. JO did the initial cleaning and coding of the data. DM supervised the transcription of the FGDs and helped in the interpretation of the themes for the manuscript, MK, ZN, and JO read, critiqued and gave valuable inputs on the paper.

Authors' information.

The lead author RPO (MPH) is a HIV prevention specialist working at CDC Kenya with primary responsibility and focal person for HIV testing and counselling services and lead in the Home based testing and counselling services. She is the Activity manager for the cooperative agreement under which this work was carried out responsible for the sound programmatic aspects, offering technical direction and support, managerial and financial management for the implementation of the project. TA is a senior statistician at CDC Kenya, Division of Global HIV and AIDS (DGHA) and holds a PhD in Statistics.

Competing interests

The authors declare that they have no competing interests.

Results: Out of the 1257 participants, 1078 (85.8%) had ever tested for HIV, with 74.2% having tested in the Kibera HBTC program. Nearly all (97.4%) rated HBTC experience as either excellent (62.4%) or good (37%) and would recommend it to a friend. Provision of prevention messages was high among HBTC clients compared to clients from other testing sites; partner reduction counselling (64% versus 52%) and faithfulness (78.3% versus 67%); $p=0.001$. Self-reported behavior change after HBTC was generally low with condom use at 10.7% and men more likely to practice safer sex ($p = 0.002$). Trust of the sexual partners and fear of suspicion were the main reasons given for not using condoms. Clients testing HIV positive after previous negative result were 3.4%. The focus group discussions reported multiple sexual partnerships among both HIV negative and positive residents alike.

Conclusion: Although prevention messages delivered during HBTC are accepted and appreciated in this community, their utilization is low in both HIV negative and positive individuals. Innovative strategies for change of normative beliefs about sexual behavior are urgently needed.

Keywords

Home based testing and counseling; Provision of prevention messages; Utilization of prevention messages; Behavior change

Introduction

In Sub Saharan Africa, the highest prevalence and incidence of HIV infection is attributable to hetero sexual transmission [1, 2]. Additional evidence shows that new infections occur in cohabiting partners, many of whom are unaware of their HIV-positive status and among those who are aware but have not disclosed their HIV status to their sexual partners [3].

Heterosexual transmission is the highest contributor to new HIV infections in Kenya [4], including in married and cohabiting partnerships. The majority of Kenyans perceive themselves at no risk (37.3%) or low risk of HIV infection (37.4%) [5] and this perception hinders use of HIV testing services and knowledge of their HIV status.

Lack of use of testing and counselling services is also attributable partly to stigma [6] distance and travel barriers [7]. Home based testing and counseling (HBTC) increases access to HIV testing and counseling (HTC) services especially in low income settings, where individuals who are less likely to visit health facilities get to learn of their HIV status [8, 9].

In order to increase knowledge of HIV status among Kenyans, the government expanded and scaled up HIV Testing service (HTS) provision strategies with the goal of universal access [10]. The strategies include HBTC services which were recommended for high burden, high density congregate areas including urban slums [11].

Several studies and programs in Kenya have reported high acceptability and uptake of HBTC services among those approached and offered services [12, 13, 14]. From July 2009 – April 2011, HBTC services were offered to all adults of 18 years and above and mature minors from 13 years to 17 years who were residents of Kibera slums in Nairobi, Kenya's capital city and who gave informed consent to participate in home based testing and

counseling. (Mature minors are individuals who have not attained the age of 18 years but are living in consensual sexual relations or have given birth or are pregnant [15]. The household coverage with services was 95% in the targeted areas and testing uptake was 97.7% among those reached. In addition to offering individuals the opportunity to learn their HIV status, the package of services in HBTC in Kenya includes education on HIV prevention strategies. 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 partner of known HIV status, promotion of use of prevention of mother to child transmission (PMTCT) services for pregnant women, messages about voluntary male medical circumcision (VMMC) for uncircumcised men, encouraging treatment of sexually transmitted infections (STIs) and referral for immediate access to care and treatment services for those diagnosed with HIV.

Modest reduction in HIV risk behaviors has been reported among persons who test positive thus reducing risk of transmission of HIV [16]. Risk reduction has only been evaluated and reported among clients who receive health center based testing and counseling services (VCT services) [17]. While HBTC has been reported to yield high acceptance and uptake of testing services [5, 9,13, 18] and promotes early HIV diagnosis [5, 14, 12], the degree to which HBTC may increase protective behavior following the delivery of prevention messages in HBTC among the low socio-economic groups who live in congregate informal settlements has not been established. The purpose of this study was to explore the level of provision of prevention message during HBTC, assess utilization of HIV prevention messages subsequent to HBTC and assess the level of self-reported sexual risk behavior reduction among individuals who had received HBTC.

Methods

Study Area

This was a mixed method cross-sectional study combining both quantitative and qualitative methods conducted in Kibera informal settlements in Nairobi, Kenya between August and November 2012. HBTC services had been offered to residents in this area previously from July 2009 to April 2011 as described above. The settlement has high population density, and is characterized by low socio economic status and high rates of unemployment among young adults who remain idle and often engage in high HIV associated risk behaviors like high alcohol consumption, prostitution, child labor and petty offences [19].

Three out of the 9 administrative villages in the slum area were purposively selected based on existing knowledge about village residency so that all ethnic groups in the slum were represented. A sample size of 920 participants was calculated using Fisher's sample size calculation formula for cross sectional study designs [20] within 95% confidence interval and based testing coverage in Kenya at the time [21]. The sample was distributed among the three villages by probability proportional to size based on the predetermined population of each village. The participants were sampled using the WHO modified compact segment sampling [22]. This method allows for revisit if a client is not found at home and also removes subjectivity and bias of choosing whom to recruit onto the study.

Quantitative data

Data were collected by face to face interviews using a structured questionnaire. Interviewers obtained demographic data, history of HIV testing and counseling, experiences with HBTC, provision of prevention messages at the time of last HBTC, message utilization and behavior change. Clients who reported a previous HIV positive test result and were able to show the medication they were taking, had the interview only and were not requested to take an HIV test. All consenting adult participants who reported previous HIV negative results or who reported to be HIV positive but had no evidence received HBTC services and were interviewed. Additionally, mature minors defined as children who have not attained the legal adult age by Kenyan law but were pregnant, living in a consensual sexual relationship, married or engaged in continuous sexual relations and who gave consent were also recruited into the study. Rapid test kits were used in serial testing as per the national algorithm and results given on the spot [15]. Quality of testing was ensured by the research assistants participating in the routine national proficiency testing program administered by the National HIV Reference Laboratory (NHRL).

Qualitative Data

Qualitative data were obtained by conducting six (6) focus group discussions (FGDs), each comprised of between 6–9 persons consisting of both men and women. The participants were approached during walks through the villages and meeting them during their routine activities. Those willing to participate, able to speak English or Kiswahili and had been residents for the last 2 years were recruited and divided into age groups 18–30 and 31–50 years based on information obtained from quantitative data and cultural guidance from the residents. The FGDs explored knowledge and experiences with HIV testing and counseling services, interaction and messages provided by service providers during the previous HBTC session, satisfaction with the services, benefits of HTC and where to obtain services; views about referral to and actual uptake of treatment services among those who tested HIV positive. Other areas explored included utilization of prevention messages for behavior change, including consistent condom use, disclosure of HIV status to sexual partner, sexual partner reduction, partner testing, treatment of STIs and access to VMMC, PMTCT and family planning (FP) services.

Ethical Considerations

The study was approved by the Kenya Medical Research Institute (KEMRI) scientific committee and ethical review committee as well as CDC's Associate Director for Science. Written consent was obtained from all the research participants both for the quantitative interviews, testing, and qualitative interviews. Throughout the process of HIV testing and counseling, confidentiality was maintained and individual rights to privacy were respected. Individual testing and counseling was done unless the individuals gave consent to be tested as couples or families.

In the FGDs, each participant gave a written consent and was given and referred to by a code for confidentiality.. Each group also provided verbal consent for use of audio recording during the discussions.

Quantitative data analysis

Descriptive analysis was done on the demographic characteristics of the participants and reported as means with standard deviation (SD) for continuous variables and percentages for categorical variables. Using chi squared tests receipt of each prevention message was analyzed by sex. To quantify the provision of prevention messages during HBTC, a composite prevention message provision index was constructed. The components considered whether the following messages were given during HBTC (yes/no): *condom use; partner reduction; faithfulness; VMMC; STI treatment; family planning; and message about treatment enrolment*. Multiple correspondence analysis (MCA) was used to construct this index and calculate the weights using STATA 13.0 (Stata Corp, 2013) with adjustment of the principal inertias (Eigen values), [23]. 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, respectively. The individual reported prevention messages received were also compared by place of testing either in HBTC or non HBTC sites.

Using MCA, we created a self-reported behavior change index based on responses (yes/no) to the following questions: *Since learning your HIV status have you used protection during sex; and since learning HIV status have you 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 indent*). Pearson's Chi-square statistic was used to test for bivariate association between receipt of HBTC prevention message index and the behavior change index and the covariates identified. Bivariate cross tabulation was carried out to assess the association between the prevention message receipt index and selected covariates. Ordered logistic regression analysis was carried out using the logit command in STATA 13 with the behavior change index as the outcome variable of interest. The predictors included in the best fitting regression model were those found to be significant ($p < 0.1$) during the bivariate analysis.

Qualitative data analysis

Responses from the 6 FGDs were merged and categorized by the themes of the discussion guide sub headings including; knowledge of HIV testing and counseling, experiences with HIV testing and counseling, messages given at HBTC, benefits of HIV testing and benefits of HBTC. Using priori (potential) codes list coding was done by reading through the text twice and summarizing each response in the text by assigning a word or phrase description to it that best answered the research question [24]. Repeated or recurring words or phrases were reduced to a single one. This list of key words / phrases were entered into Atlas 3.0 and tagged to their associated segments of the merged text that best addressed the research question. This was to ensure that no segment of responses was missed. We identified the

recurring patterns to arrive at the final themes from the text by sorting out the final codes. The tagged text segments were then reviewed and the most interesting quote selected to represent what the segment was saying in answering the research question. These were used in presenting the results.

RESULTS

Quantitative Results

Characteristics of participants—Table 1 provides a summary of socio-demographic characteristics of the study participants. A total of 1257 participants (66% females) were enrolled in the quantitative study. The average age of participants was 28 (SD=11) years and the majority (68%) were between ages 19–34 years. Slightly over half (55%) of the participants had attained primary level of education followed by secondary education (37.5%); and, a small number (6.5%) had attained tertiary education. There were more females (61.90%) reporting primary level than other levels of education while among males, the majority (47.90%) reported secondary level than other levels of education. Slightly over half (53.5%) reported they were married. Compared to their male counterparts, slightly more females (56%) were married than the males (48%). Overall, 39.9% reported no occupation and a similar proportion (39.4%) were engaged in unskilled jobs. The majority of females (52.80%) had no occupation compared to the males where 53.30% were involved in unskilled jobs with 66% of them employed. Among the females the majority (69%) had no employment.

Reported HBTC uptake and experiences—Out of the 1257 participants, 1,078 (85.9%) had ever tested for HIV, with 74.2% having tested in the Kibera HBTC program (Table 1). Of those who had tested in HBTC, 97.4% rated HBTC experience as either excellent (62.4% of participants) or good (37% of participants) and reported they would recommend HBTC to a friend. The majority 662 (61.8%) of those who had received HBTC reported having received subsequent testing for HIV in hospital. Of those reporting previous testing in HBTC, 25 participants (2.4%) self-reported being HIV positive. Of those reporting HIV negative status, 1222 (99%) accepted testing. A total of 39 (3.4%) participants who reported previous HIV negative test results, tested HIV positive in this study; 28 (72 %) of them having been tested previously at the Kibera HBTC program.

Most of the participants (82.8%) reported having had a condom demonstration at the last HBTC, but only 39.6% reported having been offered condoms at the time, out of which 97.2% declined to take the condoms citing no need for them. Of the 28 HBTC participants who tested HIV positive in this study, the majority 23 (82%), had received condom use demonstration but only three (15%) participants out of the 28 reported they had used condoms always in the last 3 months. Seventeen participants reported no condom use, of those, 11 (64.7 %) reported that they trusted their sexual partners, 5 reported they did not trust their partners and one participant reported partner refusal to use condom while three did not respond to the question.

Comparison of Prevention messages received by place of testing: HBTC versus all other testing strategies—Table 2 provides the proportion of participants

reporting receipt of prevention messages across all sites (HBTC, Hospital, VCT, workplace, and mobile outreach sites) in descending order. The highest reported was Condom use (85%), faithfulness (72%) and partner reduction (57%). Testing location was associated with messages provided: faithfulness (78% in HBTC versus 67% in other sites ($p=0.001$)), partner reduction (64% in HBTC versus 52% in other sites ($p=0.001$)). Although there were slightly more participants reporting receipt of condom use demonstration and counseling at other testing sites (85.4%) than in HBTC (83%), this was not significant ($p = 0.367$). STI treatment messages, on the other hand, were more prevalent at other testing sites (23%) than in HBTC (16%, $p=0.012$). STI prevention and treatment messages was least reported in all sites

The unadjusted results for prevention messages delivered during HBTC (Table 3) suggest that reported delivery was: higher among females (553) than males (266) (OR=1.45, 95% CI=1.11–1.90, AOR = 1.21, 95% CI 0.88–1.66); significantly higher among individuals 25–34 years (AOR=1.8, 95% CI=1.09–2.95) AOR = 1.84(1.01–3.37) and those 55–64 years (OR=3.22, 95% CI=1.08–9.59), AOR=3.51(1.07, 11.54) compared to those 13–24 years; and higher among married and separated individuals compared to those that were single. However, the adjusted results suggest that age, occupation and marital status were the main factors associated with levels of access to prevention messages in HBTC. Overall, there were more respondents in the middle index category, 339 (41%) than the low index category 286 (35%) and the high index category 194 (24%).

Reported Sexual behavior following receipt of HIV prevention messages in HBTC—The majority of the participants (80%) reported they had never used condoms in their lifetime despite receiving demonstration on how to use it at previous HBTC, and only 10.7% reporting consistent use of condoms. Of those reporting no condom use at the last sex, 80.7% reported they trusted their sexual partners. Only three percent (3%) of the participants reported partner refusal to use condoms.

In bivariate analysis (Table 4), adoption of safer sexual practices including (use of condoms, partner reduction, faithfulness to one sexual partner of known HIV status) for behavior change was associated with all the covariates considered except employment status and whether the partner was new or not. Overall, most participants reported no change in risky sexual behavior with men were more likely to report practicing safer sex after learning their HIV status than females ($p = 0.002$) and this declined with age but increased with education. Marital status was found to be negatively associated with the adoption of safe sexual practices, with married individuals less likely to adopt safe sex practices compared to singles (Adjusted Odds ratio (AOR))=0.09, 95% CI=0.02–0.28). The results also suggest that individuals with moderate levels of access to prevention messages in HBTC were more likely to adopt safe sex practices compared to those with low levels of access. However these practices were less likely in those with high levels of access to prevention messages. The participants whose last testing site was a VCT center were more likely (33%) to use protection than those who tested at home (22%), and in hospital (13.2%).

Qualitative findings

Focus Group Discussions—A total of six focus group discussions were held comprising of 18 women and 27 men.

HBTC Experience—All the participants had heard of HTC and were aware of the different sites to obtain the services in general. The majority of the participants were satisfied with the services; they reported that HBTC was a convenient and confidential strategy eliminating fear; that the providers' approach and demeanor were very polite and that they explained everything in detail.

“HBTC saves time you will be tested when cooking your meal” (Female, 31–50 years)

“I had been planning to go, but always doing something for the first time is always very difficult. I even had gone to the testing center and gone back home without testing” (Male, 18–30 years)

However, a few participants reported concerns that some providers were in a hurry and also not sensitive to the presence of children as they introduced the topic of HIV testing and conducted condom demonstration.

“The first thing they say is that 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, 31–50 years)

Some service providers were reported to be 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 kobe” (tortoise) because when they do, they get time to gossip.....” (Male 18–30 years)

The FGD participants reported that testing for HIV in this community was regarded as normal following the HBTC service offered previously and reported having re-tested several times thereafter but prior to that, people especially men feared to test for HIV and assumed the results of their sex partner was same as theirs.

“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 31–50 years)

“I had gone to AMREF before you started coming to our houses, when I arrived at the gate to start taking the stairs, it was like I was beaten because I looked at the way people were seated at the bench, and you see your friends who are already infected.....” (Male, 31–50 years)

Participants expressed the desire to have HIV testing services taken to the community more frequently.

“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)

Participants also reported that many of them accessed HTC services in groups of friends and that this was a common practice among the residents as they were aware that they shared sexual partners.

“I could have a girlfriend and have “raha” (Kiswahiii word for 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. This makes us to test together as men” (Male 18–30 years)

Prevalence of reported prevention messages received in previous HBTC.—All the study participants were unanimous that they were given good and useful information during HBTC on how to protect themselves against HIV infection including; need to know ones HIV status, use of condoms, partner testing, faithfulness to one sexual partner, reduction of sexual partners and taking medication if found HIV infected. However, while some said the information was new, others reported that it is not new but that in the home it was given in a friendly way and they also had the chance of testing with their spouse.

“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 18–30years)

“They also ask you if you are married or in a relationship and the importance of being tested together” (Female 31–50years)

“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 a couple (Female 31–50Years)

Reported sexual behavior following receipt of HIV prevention messages at HBTC—There were mixed responses about use of prevention messages with the majority expressing that they were not used. It was reported that, by and large, condoms are mainly used by the younger people and that use of condoms in marriage is challenging as it is viewed with suspicion on the part of the partner suggesting its use.

“Using condoms means that you have other affairs.....” (Male, 18–30 years)

“That information is not effective I know three people who are HIV positive and they are not using condoms” (Female, 18–30 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 31–50 years)

The reports suggested that the decision to use condoms is left to the man who is seen to be in control.

“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 tying there waiting for a man to get inside you” (Female 18–30 years)

Participants’ reported that there was extensive casual sex without use of protection among the residents in the informal settlement both among those HIV infected and those not infected.

“In this life we live, we have sexual intercourse... 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 – 31–50 years)

In addition to trust of the sexual partner reported in the quantitative study, the FGD participants also reported that those who are HIV positive do not use condoms as they argue there is no need because they were already HIV infected. Additionally condom use was perceived to be associated to early death by those infected with HIV, this hindered condom use.

“... 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)

DISCUSSION

The goal of this study was to determine if HIV prevention messages which had been offered during HBTC were being utilized by the recipients. Overall, we found high prevalence of provision of prevention messages with reported acceptability, appreciation and knowledge of the prevention messages following previous HBTC. However we found very low utilization of the messages for HIV prevention, among both the 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.

Overall, the provision of prevention messages were reported to be higher in HBTC setting compared to other HTC sites (VCT, hospital, mobile and workplace settings). Although condom demonstration was reportedly received by 80% of the previous Kibera HBTC services recipients, only about 40% of them had been offered condoms with an uptake of just over 2%. Refusal to take condoms has been associated with stigma [25]. In our study, several other factors were cited by residents that led to declining to receive condoms during HBTC, including: trust for the sexual partner, fear of being seen by children taking condoms, and community perceptions and attitudes towards condom use. The reported regular condom use by about 11% of the participants in this community is much lower than the 39.9% reported use among individuals who were unaware of their HIV positive status in a nationally representative survey in Kenya [26] but consistent with reports from elsewhere [27]. While other studies reported reduced rates of unprotected sex among those living with

HIV upon learning their status [28], our study found that only 15% of the PLHIV used condoms in this informal settlement. This underscores the need for innovative ways of breaking the barriers to condom use by promoting condoms more effectively and making condoms available in this slum area. The finding that lack of condom use is attributable to trust of the sexual partner and fear of suspicion of the partner suggesting condoms use is consistent with findings from other studies [29]. The use of community-based campaigns [30] has the potential of reducing condom stigma and negative perceptions and beliefs about condom use. Lack of women empowerment and ambivalence towards condom use [26] as demonstrated by our results is a critical barrier to HIV prevention. Strategies targeting women, to empower them to embrace and negotiate condom use would play a big role in HIV prevention in this slum area.

Unless the result is different from what the individual expected [31, 32] receiving a negative HIV result after a risk exposure reinforces low risk perception [33]. The latter is consistent with our finding; participants both in quantitative and qualitative sessions reported that nothing had changed in their risky sexual life since the previous HBTC. Normalization of HTC services achieved by HBTC in this slum area promoted disinhibition [34]. Residents who believed they were HIV negative engaged in unprotected sex with individuals of unknown HIV status at will and sought testing services thereafter as a mitigating measure against HIV acquisition. Repeated testing without adoption of safe sexual practices is not protective against HIV acquisition [35] as it may have been misinterpreted by these slum residents. This misinterpretation underscores the need for innovative strategies in delivering prevention messages.

Extensive social tolerance of extramarital sex without protection reported in this community is a barrier to HIV prevention as it is in many African societies [36]. Additional barriers in this community are low socioeconomic status and high alcohol consumption which are related to permissive sexual acts, both for pleasure and as a means to economic gains [36]. While HBTC accords the client the convenience and flexibility of continuing with their domestic chores and thus increases acceptability, this may ultimately be a barrier to the internalization and reflection on the prevention messages offered due to divided attention.

This study was not without limitations; the results on sexual behavior are by self-report which have the potential of social desirability and inconsistency [35]. This might explain the high percentage of participants reporting having only one sexual partner in quantitative data and the contradiction from the reports by the FGD participants of the multiple and permissive sexual partnerships among residents. Another limitation is that information on provision of prevention messages relied on recall by those who received them at least 16 months in the past and this may be subject to recall bias. There was also a lot of changing denominators partly because of the slip command in the questionnaire or participants chose not to respond to the question or could not remember. We used mixed method in this study to help mitigate these limitations and to help explore the issues under investigation.

Conclusion

HBTC is an effective strategy in reaching hard-to-reach populations, increases access to HTC services and normalizing testing for HIV in these settings. Prevention messages offered during HBTC are viewed by residents as very important but their use is limited as residents report engaging in risky sexual behaviors and then present themselves for HTC to confirm their HIV status. These findings suggest that one time prevention messages delivered at HBTC are not effective in achieving behavior change. We suggest that counseling skills should move from mere provision of information to more thought provoking strategies like motivational interviewing [37] and combination of strategies [38] of delivering HIV prevention messages based on client's circumstances. The use of social ecological models have been found effective in health promotion [25] and may be useful in delivering innovative strategies for change of normative expectations related to sexual behavior and specifically condom use. Additionally, given the permissive sexual behaviors in this slum area, programs should critically review the frequency for HIV re-testing of residents in this informal settlement to identify early those who are HIV infected and put them on lifesaving antiretroviral drugs, and at the time reduce HIV transmission.

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Disclaimer

The findings and conclusions in this paper are those of the author(s) and do not necessarily represent the official position of the U.S. Centers for Disease Control and Prevention (CDC) and the Government of Kenya.

List of Abbreviations

AOR	Adjusted Odds Ratio
CI	Confidence Interval
DGHT	Division of Global HIV/AIDS and Tuberculosis
FGDs	Focus Group Discussions
FP	Family planning
HBM	Health Belief Model
HBTC	Home Based Testing and Counselling
HIV	Human Immune Deficiency Virus

HTC	HIV Testing and Counseling
KAIS	Kenya Aids Indicator Survey
KEMRI	Kenya Medical Research Institute
MCA	Multiple Correspondence Analyses
NASCOP	National AIDS and Sexually Transmitted Infections Control Program
NHRL	National HIV Reference Laboratory
PMTCT	Prevention of Mother to Child Transmission of HIV
RRR	Rapid Results Initiation
STI	Sexually Transmitted Infection
VCT	Voluntary Counseling and Testing
VMMC	Voluntary Male Medical Circumcision
WHO	World Health Organization

REFERENCES

1. UNAIDS. HIV Prevention Fast Facts 2009 <http://data.unaids.org/pub/brochurepamphlet/2009> (accessed 15 Feb 2015)
2. Heageman KM, Dube HMB, Mugurunqi O, Gavin LE, Hader SL and St Louis ME. Beyond monogamy: Opportunities to further reduce risks for HIV infection among married women with only one lifetime partner AIDS and Behaviour 2010; 14: 113–124
3. Dunkle KL, Stephenson R, Karita E, Kayitenkore K & Vwalika C New heterosexually transmitted HIV infections in married or cohabiting couples in urban Zambia and Rwanda: an analysis of survey and clinical data. Lancet. 2008; 371(9631):2183–2191 [PubMed: 18586173]
4. Gelmon L, Kenya P, Oguya F, Cheluget B and Haile G. Kenya Modes of HIV Transmission study– National Aids Control Council (NACC) (2009).
5. National AIDS and STI Control Program (NASCOP), Kenya, Kenya AIDS Indicator Survey 2012:
6. Sabapathy K, Bergh van den R, Fidler S, Hayes R, and Ford N. Uptake of HBTC in Sub –Saharan Africa: A systemic review and Meta–Analysis Plos Medicine 2012; 9(12): e1001351
7. Matovu JK & Makumbi FC) Expanding access to HIV counseling and testing in Africa. Tropical Medicine and International Health. 2007; 2 (2):1315–1322
8. Menzies N, Abang B, Wanyenze R, Nuwaha F, Mugisha B, Continho A, et al.: The cost effectiveness of 4 counseling and testing strategies in Uganda. AIDS. 2009; 1 28; 23(3):395–401. [PubMed: 19114865]
9. Helleringer S, Kohler HP, Frimpong JA and Mkandawire J. Increasing uptake of HIV testing and counseling among poorest in sub–Saharan countries through home based service provision J Acquir. Immune Defic. Syndrome 2009; 51:185–93 (Pub Med 19352202)
10. Ng’ang’a Anne, Waruiru Wanjiru, Ngare Carol, Ssempijja Victor, Gachuki Thomas, Njoroge Inviolata, et al.; for the KAIS Study Group The Status of HIV Testing and Counseling in Kenya: Results from a Nationally Representative Population–Based Survey. J Acquir. Immune Defic. Syndr 2014; Volume 66, Supplement 1,
11. National AIDS and STI Control Program (NASCOP), (2011). Ministry of Public Health and Sanitation. National Operational manual for Community Based–based HIV Testing and counseling.

12. Wachira J, Kimaiyo S, Samson Ndege S, Mamlin J, and Braistein P. What is the impact of Home based counseling and testing on the clinical status of newly enrolled adults in a large HIV care Program in Western Kenya? *Clinical Infectious Diseases* 2012; 54: 275–281. [PubMed: 22156847]
13. Dalal W, Feikin DR, Amolloh M, Ransom R, Burke H, Lugalia F, et al. Home based Testing and Counseling in rural and urban Kenya communities. *J Acquir. Immune Defic. Syndr.* 2013; 1:62(2).
14. Kimaiyo S, Ndege SK, Were MC. Know Your Epidemic, Home based HIV counseling and testing in Western Kenya. *East African Medical Journal* 2010; 87: 100–8. [PubMed: 23057305]
15. National AIDs and STI Control Program, Ministry of Health Kenya National Guidelines for Testing and Counseling 2008
16. Bunnell Rebecca, Ekwareu John Paul, Solberg Peter, Wamai Nafuna, Winnie Baikaako– Kajura Willy Were, et al. Changes in Sexual Risk Behaviours and risk of HIV transmission after antiretroviral therapy and prevention interventions in rural Uganda. *AIDS* 2006; 20: 85–92 [PubMed: 16327323]
17. Arthur G, Nduba V, Forsythe S, Mutemi R, Odhiambo J and Gilks C. Behavior change in clients of health center based voluntary HIV counseling and testing services in Kenya . *Sex Trans Infect.* 2007; 83(7) 641–546
18. Medley A; Ackers M; Amolloh M; Owuor P; Mutai H; Audi B; et al. Early Uptake of HIV Clinical Care After Testing HIV –Positive during Home Based Testing and Counseling in Western Kenya. *AIDS Behav.* 2013; 17:224–234 [PubMed: 23076720]
19. Kenya National Bureau of Statistics, Kenya Population and Housing Census, 2009
20. Fishers A; Andrew E; Townsend W (1998): Handbook for family planning operations research designs. 2nd edition USA: Population Council.
21. Kenya National Bureau of Statistics (2009). Kenya Demographic and Health Survey 2008–2009
22. Milligan Paul, Njie Alpha and Bennett Steve. Comparison of two cluster sampling methods for health surveys in developing countries. *International Journal of Epidemiology* 2004; 33:469–476 [PubMed: 15020569]
23. Greenacre MJ Correspondence analysis in practice, (2nd ed.). Boca Raton, FL: Chapman & Hall/CRC 2007.
24. Burnard P, Gill P, Stewart K, Treasure E and Chadwick B Analysing and Presenting qualitative data *British Dental Journal* 208; 204 (8)
25. Chandran TM, Berkvens D, Chikobvu P, Nostlinger C, Colebunders R, Williams BG, et al. Predictors of condom use and refusal among the population of Free State province in South Africa. *BMC Public Health* 2012; 381 available at <http://www.biomedcentral.com/1471-2458/12/381> accessed June 2015
26. Mwangi Mary, Bunnell Rebecca, Nyoka Raymond, Gichangi Anthony, Makokha Ernest, Kim Andrea et al. Unsafe Sex among HIV infected adults in Kenya: Results from a nationally representative survey. *Acquir Immune Defic Syndr.* 2011; 58 (1)
27. Nuwaha Fred, Kasasa Simon, Wana Godwill, Muganzi Elly and Tumwesigye Elioda.) Effect of home–based HIV counselling and testing on stigma and risky sexual behaviours: serial cross–sectional studies in Uganda. *Journal of the International AIDS Society* 2012; 15:17423 <http://www.jiasociety.org/content/15/2/17423> | <http://www.jiasociety.org/content/15/2/1742310.7448/IAS.15.2.17423> | <http://dx.doi.org/10.7448/IAS.15.2.17423> accessed 14th April 2015
28. Bunnell R, Opio A, Musingusi J, Kirungi W, Ekwaru P, Mishra V, et al. HIV transmission risk behavior among HIV infected adults in Uganda: results from a nationally representative survey. *AIDS* 2008; 22(5) 617–624. [PubMed: 18317003]
29. Pettifor A, MacPhail C, Connell A, Sibeko J, Kamanga G, Rosenberg N, et al. Continued High risk sexual behavior following diagnosis with acute HIV infection in South Africa and Malawi: Implications for prevention. *AIDS and Behaviour* 2012; 15(6):1243–50
30. Suthar A B, Klinkenberg E, Ramsay A, Gragn N, Bennett R, Towle M. et al. Community based multi disease prevention campaign for controlling Human immune deficiency virus associated with Tuberculosis. *The International Journal of Tuberculosis and Lung Disease* 2012; 16:4 <http://www.ingentaconnect.com/content/ijtld/2012/00000016/00000004/art00004> Accessed on / 13/2013 [PubMed: 22236840]

31. Denison J, O'Reilly K, Smind G, Kennedy C, and Sweat M. HIV Voluntary testing and counseling and behavioral risk reduction in developing countries: a meta-analysis. *AIDS Behaviour* 2008; 12(3):363–373
32. Gong Erick, HIV Testing and Risky Sexual Behaviour. *The Economic Journal*. 2014; 125 <http://onlinelibrary.wiley.com> accessed on 27th May 2015
33. Sherr Lorraine, Lopman Ben, Kakowa Memory, Dube Sabada and Godwin Chawira Voluntary counselling and Testing; uptake impact on sexual behaviour and HIV incidence in a rural Zimbabwean cohort. *AIDS* 2007; Vol 21 No7, 851–859 [PubMed: 17415040]
34. Gray Ronald, Kigozi Godfrey, Serwadda David, Makumbi Frederick, Watya Stephen, Nalugoda Fred, et al. –02–01). Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial <http://www.thelancet.com/journals/articles/piis0140673603134> accessed on 11th May 2015
35. Exener T, Hoffman S, Parikh K, Leu Cheng Shi and Ehrhardt. HIV Counseling and Testing: Womens Experiences and the perceived role of Testing as a prevention strategy. *Perspectives on Sexual and Reproductive Health* 2002; 34: 2
36. Vu Lung, Waimar Tun; Andrew Karlyn; Sylvia Adebajo; Babatunde Ahosi. Attitudinal and Behavioral factors associated with extramarital sex among Nigerian Men: Findings from a national survey. *International Journal of Sexual health* 2011; 23: 258–268
37. Sobell and Sobell, 2008 Motivational Interviewing Strategies and Techniques: Rationales and Examples available at http://www.nova.edu/gsc/forms/mi_rationale_techniques.pdf accessed on 20th May 2015
38. Amar Shireeesh Kanekar. HIV/AIDS Counselling Skills Strategies: Can testing and Counselling Curb the Epidemic? *International Journal of Preventive Medicine* 2011; 2(1): 10–14 [PubMed: 21448398]

Table 1:

Socio-demographic and key characteristics of Kibera study participants

	Overall (N %)	Male (n %)	Female (n %)	p- value
	N=1,257	N=422	N=835	
Age in Years (mean , SD)	27.88(10.45)	30.04 (12.20)	26.78 (9.25)	<0.001
Age in years (N =1250)				
13-18	149(11.90)	42(10.00)	107(12.90)	
19-24	457(36.60)	136(32.20)	321(38.80)	
25-34	396(31.70)	132(31.30)	264(31.90)	
35-44	146(11.70)	63(14.90)	83(10.00)	
45-54	68(5.40)	27(6.40)	41(5.00)	
55-64	22(1.80)	13(3.10)	9(1.10)	
65+	12(1.00)	9(2.10)	3(0.40)	
Occupation (N=1257)				<0.001
None	502(39.90)	61(14.50)	441(52.80)	
Unskilled	495(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)	
Education (N=1257)				<0.001
No formal	12(1.00)	2(0.50)	10(1.20)	
Primary	691(55.00)	174(41.20)	517(61.90)	
Secondary	472(37.50)	202(47.90)	270(32.30)	
Tertiary	82(6.50)	44(10.40)	38(4.60)	
Marital status (N=1257)				<0.001
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)	
Separate	38(3.00)	8(1.90)	30(3.60)	

	Overall (N %)	Male (n %)	Female (n %)	p- value
Employed (N=1257)	N=1,257	N=422	N=835	
Yes	539(42.90)	282(66.80)	257(30.80)	<0.001
No	718(57.10)	140(33.20)	578(69.20)	
Circumcised (N=1257)				0.981
Yes	318(79.70)	310(79.70)	8(80.00)	
No	81(20.30)	79(20.30)	2(20.00)	
Ever tested for HIV (N=1255)				<0.001
Yes	1,078(85.90)	340(80.80)	738(88.50)	
No	177(14.10)	81(19.20)	96(11.50)	
HBCT tested (N=1099) ¹				0.511
No	284(25.80)	86(24.60)	198(26.40)	
Yes	815(74.20)	264(75.40)	551(73.60)	
How would you rate the HBTC experience? N=813) ¹				0.838
Excellent	507(62.40)	164(62.40)	343(62.40)	
Good	301(37.00)	98(37.30)	203(36.90)	
Fair	5(0.60)	1(0.40)	4(0.70)	
Where did you test last?(N=1072) ¹				<0.001
Hospital	662(61.80)	149(43.80)	513(70.10)	
Home	326(30.40)	145(42.60)	181(24.70)	
Mobile	55(5.10)	28(8.20)	27(3.70)	
Workplace	7(0.70)	6(1.80)	1(0.10)	
VCT center	22(2.10)	12(3.50)	10(1.40)	
Have you ever had a demonstration on how to use condoms? (N=1253)				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 after test (Q34)(N=1081) ¹				<0.001
Yes	278 (25.72)	135 (39.59)	143 (19.32)	

	Overall (N %)	Male (n %)	Female (n %)	p- value
No	N=1,257 803 (74.28)	N=422 206 (60.41)	N=835 597 (60.41)	
Have you used condoms in the last 3 months? ¹				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)	
Sero-conversion (N=991) ¹				0.241
No-still negative	962(97.10)	304(98.40)	658(96.50)	
Seroconverted	28(2.80)	5(1.60)	23(3.40)	
Still positive	1(0.10)	0(0.00)	1(0.10)	
Total	991(100.00)	309(100.00)	682(100.00)	
Individual result (N=1222)				0.029
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)	

¹The denominators vary partly because there was a skip command in the questionnaire, or the participant chose not to answer the question or could not remember

Distribution of respondents by place of testing and prevalence of receipt of prevention of messages

Table 2.

Type of messages given provided	Place of testing			Total n(%)
	Tested elsewhere* n(%)	In HBTC n(%)	N=812	
<i>Condom use (p=0.367)</i>				
No	73(14.6)	53(17)	126(15.5)	
Yes	426(85.4)	259(83)	685(84.5)	
<i>Faithfulness (p=0.001)</i>				
No	163(32.7)	68(21.7)	231(28.4)	
Yes	336(67.3)	245(78.3)	581(71.6)	
<i>Partner reduction (p=0.001)</i>				
No	241(48.3)	112(35.9)	353(43.5)	
Yes	258(51.7)	200(64.1)	458(56.5)	
<i>VMMC (p=0.705)</i>				
No	344(69.2)	212(67.9)	556(68.7)	
Yes	153(30.8)	100(32.1)	253(31.3)	
<i>STI (p=0.382)</i>				
No	476(95.6)	293(94.2)	769(95.1)	
Yes	22(4.4)	18(5.8)	40(4.9)	
<i>STI treatment (p=0.012)</i>				
No	383(76.9)	262(84.2)	645(79.7)	
Yes	115(23.1)	49(15.8)	164(20.3)	
<i>Treatment enrolment (p=0.852)</i>				
No	413(83.1)	260(83.6)	673(83.3)	
Yes	84(16.9)	51(16.4)	135(16.7)	

* Elsewhere includes; Hospital , VCT and other mobile outreaches testing points put together

Bivariate analysis and ordered logistic regression analysis of the HBTC message receipt index and selected demographic characteristics.

Table 3.

	HBTC message provision index				Total	OR (95% CI)	AOR (95% CI) ‡
	Low n(%) N=286	Middle n(%) N=339	High n(%) N=194	N=819			
<i>Sex (p=0.001)</i>							
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)
<i>Age category (p=0.004)</i>							
13–18	22(36.1)	34(55.7)	5(8.2)	61	1.00		1.00
19–24	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)
<i>Occupation(p=0.001)</i>							
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)
<i>Education(p=0.404)</i>							
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)
<i>Marital status(p<0.001)</i>							
Single	110(40.4)	129(47.4)	33(12.1)	272	1.00		1.00
Married	163(32.9)	185(37.4)	147(29.7)	495	1.79*** (1.36,2.36)		1.49* (1.05,2.12)
Separated	13(25)	25(48.1)	14(26.9)	52	2.03* (1.18,3.49)		1.5(0.8,2.82)

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<u>HBTC message provision index</u>					
	<u>Low n (%)</u>	<u>Middle n (%)</u>	<u>High n (%)</u>	<u>Total</u>	<u>AOR (95% CI)</u> ‡
	N=286	N=339	N=194	N=819	
Total	286(34.9)	339(41.4)	194(23.7)	819	

***, **, * indicates significance at 0.001, 0.01 and 0.05 level, respectively

‡ All predictors were included in the adjusted model

Table 4. Bivariate analysis and logistic regression analysis of adoption of safe sexual practices against selected demographic variables

	Change in behavior			OR (95% CI)	AOR (95% CI)
	No change n(%)	To safer n(%)	Total N		
<i>Sex (p=0.009)</i>					
Male	241(91.3)	23(8.7)	264	1.00	
Female	528(95.8)	23(4.2)	551	0.46*(0.25–0.83)	
<i>Age (p=0.004)</i>					
13–18	54(88.5)	7(11.5)	61	1.00	
19–24	249(91.2)	24(8.8)	273	0.740.515(0.3–1.81)	
25–34	278(96.2)	11(3.8)	289	0.31*(0.11–0.82)	
35–44	116(98.3)	2(1.7)	118	0.13*(0.03–0.66)	
45+	67(97.1)	2(2.9)	69	0.230.074(0.05–1.15)	
<i>Occupation (p=0.026)</i>					
None	296(95.5)	14(4.5)	310	1.00	
Unskilled	333(95.1)	17(4.9)	350	1.080.836(0.52–2.23)	
Skilled	75(93.8)	5(6.3)	80	1.410.523(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)	
<i>Education(p<0.001)</i>					
No formal	10(90.9)	1(9.1)	11	1.00	
Primary	419(96.3)	16(3.7)	435	0.380.372(0.05–3.17)	
Secondary	293(93.9)	19(6.1)	312	0.650.687(0.08–5.33)	
Tertiary	47(82.5)	10(17.5)	57	2.130.494(0.24–18.56)	
<i>Marital status (p<0.001)</i>					
Single	232(85.6)	39(14.4)	271	1.00	1.00
Married	487(99)	5(1)	492	0.06*** (0.02–0.16)	0.05*** (0.02–0.14)
Widowed/Widower	16(94.1)	1(5.9)	17		0.2*(0.05–0.88)
Divorced	13(100)	0(0)	13		

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	Change in behavior			OR (95% CI)	AOR (95% CI)
	No change n(%)	To safer n(%)	Total N		
Separate	21(95.5)	1(4.5)	22	0.240.053(0.06–1.02)	
<i>Employed (p=0.294)</i>					
Yes	362(95.3)	18(4.7)	380	1.00	
No	407(93.6)	28(6.4)	435	1.380.296(0.75–2.54)	
<i>provision of prevention messages index (p<0.001)</i>					
low	278(97.5)	7(2.5)	285	1.00	
medium	302(89.1)	37(10.9)	339	4.87***(2.13–11.09)	
high	189(99)	2(1)	191	0.420.283(0.09–2.05)	