

**STRATEGIC ASSESSMENT TO DEFINE A
COMPREHENSIVE RESPONSE TO
HIV IN IRINGA, TANZANIA**

**RESEARCH BRIEF
SUMMARY OF FINDINGS**

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INTRODUCTION

In 2008, results of the recently completed 2007/2008 Tanzania HIV/AIDS and Malaria Indicator Survey (THMIS) highlighted a concerning trend in HIV prevalence in the Iringa region of Tanzania (Tanzania Commission for AIDS [TACAIDS], 2008). Not only did Iringa have the highest HIV prevalence in the country (15.7%) but while most other regions within Tanzania demonstrated declines in HIV prevalence from the previous Tanzania HIV/AIDS Indicator Survey conducted in 2003/04, Iringa's prevalence was even higher than the previously documented 13.4% (National Bureau of Statistics [NBS] & Ministry of Planning, Empowerment and Economics, 2010). In response, the United States Agency for International Development (USAID) had initiated a large multi-sectoral presence in Iringa with a number of collaborating implementing partners as well as long standing working relationships with local authorities. Concerns about the severe impact of HIV within the Iringa region led USAID to commission a strategic assessment to better understand factors associated with the HIV epidemic and to document the reach and scope of services in Iringa. A primary goal of this assessment was to provide guidance to stakeholders such as the Government of Tanzania and USAID about selecting and combining HIV prevention interventions as well as optimal approaches to implementation and coverage of these interventions in the region. The aims, approach, key findings, and conclusions of this strategic assessment, conducted within the purview of the Research to Prevention (R2P) project led by The Johns Hopkins University (JHU), are provided in this overview summary document.

At the time of this strategic assessment, HIV prevalence in the administrative region of Iringa, located approximately 500 km south west of Dar es Salaam, was nearly 2.5 times that of Tanzania's national average of 5.6% and significantly higher than the two next highest regions in terms of prevalence, Dar es Salaam (9%) and Mbeya (9%) (TACAIDS, 2008). HIV prevalence in the Iringa region was higher in urban (30%) compared with rural (16%) areas and among women (18%) compared to men (12%) (TACAIDS, 2008). Young women aged 15-24 years (8.2%) were almost twice as likely to be HIV-infected as young men aged 15-24 (4.8%) (TACAIDS, 2008). Eighty-five percent of transmission in Iringa was estimated to occur via heterosexual contact, with 6% occurring within mother to child HIV transmission (PEPFAR, 2006). HIV incidence data are not available for Iringa, but data from a cohort study conducted in the neighboring region of Mbeya from 2002 to 2006 indicated an approximate HIV incidence of 1.35 per 100 person-years (2002-2006), with rates as high as 2.75 per 100 person-years (Geis et al., 2011). In the 2007/2008 THMIS, prevalence in Mbeya was 9.2%, less than two thirds of Iringa's prevalence (15.7%) (TACAIDS, 2008).

Unique structural, behavioral and biomedical factors within the Iringa region may contribute to the high HIV prevalence and the observed discordance between women and men. The Tanzam Highway bifurcates the Iringa region and migration and mobility are common. The majority (61.4%) of men and women in Iringa report travel in the past year, and among those who traveled, slightly more than one-third (37%) spent more than one month away from home (TACAIDS, 2008). There are also differences between the Iringa region and Tanzania more broadly in factors that support HIV prevention. In 2008, HIV knowledge in Iringa was lower than national averages, with comprehensive knowledge at 18.7% for women and 32.4% for men as compared to national averages of 39.6% and 44.3% (TACAIDS, 2008).

Although many regions of Tanzania are traditionally circumcising areas, Iringa is not among them. As of 2008, 30% of men in Iringa were circumcised compared to 67% of men nationally (TACAIDS, 2008). HIV prevalence among non-circumcised men in Iringa was 13.7% as compared to 8% in circumcised men at that time (TACAIDS, 2008). In Iringa, 65% of THMIS respondents did not use a condom at first sex and in higher risk sex (e.g., sex with multiple partners and/or with a partner who has a higher HIV risk profile), and only 45% of women and 59% of men reported condom use at last sex (TACAIDS, 2008). It has also been estimated that 15% of women in Iringa, as compared to 10.4% of all women in Tanzania, experienced forced intercourse at sexual debut (TACAIDS, 2008).

In the recently released 2013 THMIS, although country-level HIV prevalence dropped to 5%, HIV prevalence in both Iringa (9.1%) and the newly established Njombe region (14.8%) (formerly contained within the borders of the Iringa region) remain among the highest in country (TACAIDS et al., 2013). In Iringa, women still bear the brunt of the epidemic, with significantly more women compared to men infected with HIV; approximately 11% of women were HIV-infected compared with 6.9% of men. These gender differences are even more pronounced among youth aged 15-24 years, with an estimated HIV prevalence of 7% among young women as compared to 1.5% among young men (TACAIDS et al., 2013).

The aims of the USAID-commissioned strategic assessment were to gain an enhanced understanding of trends observed between the 2003/2004 THMIS and the 2007/2008 THMIS, as well as the epidemiology of HIV and the context of HIV related service provision in Iringa that they may reflect. Existing quantitative data sources were examined and new qualitative research was conducted to achieve these aims and to offer insights into gaps in the HIV prevention response in Iringa and recommendations as to how to strengthen that response. A summary of the methods, findings, and recommendations of this strategic assessment are provided below. A compendium of six additional research briefs focused on specific topics and populations relevant to the epidemic in Iringa are presented separately providing significant depth on each issue selected. These include briefs on: HIV testing and counseling (HTC), Linkages to Care (LTC), HIV care and treatment, voluntary male medical circumcision (VMMC), socio-economic interventions for young women, and the needs and priorities of female sex workers (Research to Prevention, 2013a-f).

METHODS

Quantitative Methods

Review of existing data including recent data triangulation efforts

To assess factors associated with HIV infection in the Iringa region, the following data and material were gathered for review: the Tanzania Regional Triangulation, Mbeya and Iringa region, HIV/AIDS Data Synthesis Project (TACAIDS, 2011); published literature related to the Iringa region; reports from USAID's implementing partners; and data (including statistics, HIV reports and census information as well as antenatal care (ANC) data from every facility within a 1.5 mile radius by car of Iringa town) from local government officials at the regional, district, ward, and village level regarding a geographic area being considered for participation in a large scale combination HIV prevention community randomized trial.

To assess HIV prevention intervention coverage across the region, our team consulted government-based reports and solicited USAID implementing partners for information on service delivery. USAID/Tanzania provided our field team with a list of partners who had operations and offices in Iringa including Engender, Tunajali, AMREF, Jhpiego, PSI, Africare, FHI-ROADS, and TCCP. This also included partners whose offices were only in Dar es Salaam but who had operations that covered the Iringa region, or by default covered the whole country (e.g., mass media campaigns) including FHI-UJANA, Futures Group, Measure, Technoserve, and Abt Associates. Implementing partners were asked to provide, for example, annual and monthly reports, work plans, budgets, data quality assessment reports, data collection tools, referral forms, appointment cards, adverse events forms, and other relevant documents. Annual Progress Report (APR) and Sector Annual Progress Report (SAPR) data were collated and per district calculations were made based on rates per 10,000 of relevant populations aged 15 and above.

DHS analysis

A secondary analysis of data from the 2007-2008 THMIS was conducted to assess risk factors for HIV infection in the Iringa region relative to the rest of Tanzania. The THMIS used a conventional two-stage cluster sampling approach. In total, 15,044 women and men of reproductive age (15-49 years) were included in the survey, of which 445 were from the Iringa region.

Descriptive analysis was performed to assess differences in risk factors among those living with HIV and those not infected to confirm original descriptive results from the THMIS. Chi-squared tests were done to compare risk factors and demographic factors between HIV-infected and HIV-uninfected individuals. This analysis was stratified by geographic region to yield estimates for Iringa, all other regions outside of Iringa, and a pooled sample representing all of Tanzania.

Univariate and multivariate weighted logistic analyses were utilized to assess the determinants of HIV infection and odds ratios of HIV infection adjusted for various factors. All analyses assessed risk factors in the Iringa region compared with Tanzania overall, and then stratified by HIV status. The key outcome variable was HIV seroprevalence and the main independent variables were age of sexual debut, marital

status, age of the respondent, age difference between the respondent and his or her sexual partner, number of lifetime sexual partners, educational level of the respondent, and mobility. Mobility was defined as the frequency of movements from home as well as the duration of travel in the past year.

The multivariate model was developed through stepwise selection and purposeful selection of covariates based on a literature review and previous formative analysis. Variables significant at the 0.1 alpha level in univariate analyses, based on the Wald test for logistic regression, were selected as candidates for the multivariate analysis. All analyses were conducted using STATA software package version 11.0 (College Station, Texas, USA).

Service mapping

To develop a comprehensive inventory of existing HIV prevention services and interventions in the Iringa region, we looked first to an assessment conducted by MEASURE Evaluation in 2011. This assessment mapped health care facilities in the Iringa region, together with their catchment areas. We supplemented the MEASURE evaluation through additional visits with health facilities. Using the GPS data gathered by MEASURE and lists of facilities from district and regional officials, we visited 141 facilities in targeted clusters within the Iringa region. Targeted clusters were geographically distinct areas that were defined as intervention and control areas for a potential future cluster-randomized trial of combination HIV prevention. Clusters were defined based on population (~10,000 people), health clinic catchment area, community separators (geographic and political boundaries) and community unifiers (schools, markets, churches, roads/paths) and were located within 1.5 hours driving time of Iringa town. Twenty-four clusters were identified based on sample size calculations for the proposed study. We marked the GPS coordinates of each of these facilities, questioned health facility staff about the villages served by each individual facility and checked patient registers. Patients mark where they come from in patient registers. Through this exercise we were able to further characterize and refine catchment areas originally identified by MEASURE. The team also mapped villages in targeted clusters along with relevant roads, schools, churches, bars, markets, and geographical features such as rivers, mountains, swamps, lakes, as well as tea, timber, and tobacco plantations, and regional, district, and ward political boundaries. All of this information along with GPS coordinates for each facility location was entered into Google maps. Maps were made available to ward, district, and regional authorities in Iringa and to other non-governmental organizations (NGOs) working in the area. JHU's Iringa-based Study Coordinator shared mapping data and procedures for accessing data through Google maps with Iringa's Regional Aids Control Coordinator and Regional Medical Officer in November of 2012.

This comprehensive identification of facilities was followed by an in-depth assessment of select facilities conducted by a collaborative team of representatives from Jhpiego, USAID, JHU, Muhimbili University, and regional representatives from the Tanzanian Ministry of Health. Eighty-eight health facilities that were within or near the proposed trial clusters were chosen to undergo the facility assessment. Specific facilities were selected to provide the following additional information in preparation for a future trial: additional information on what resources would be needed for certain facilities to become CTC treatment centers; logistical and staffing information about specific facilities; and precise definitions of the catchment areas of certain facilities. Between August and November of 2012, 72 dispensaries, 12

health centers, and four hospitals in five districts were assessed. Four districts were in the Iringa region and one was in the newly separated out Njombe region. Five different questionnaires were used to assess the following areas: The organization of HIV care services within each facility; infrastructure; human resource capacity and training; clinical HIV care and treatment services; patient records and reporting systems; continuum of care; counseling and testing services; laboratory services; pharmacy services; catchment area information; availability of water, electricity, and cell phone reception; provider initiated testing and counseling (PITC) registry review, outpatient registry review, patient load for all services, and patients on care and treatment. Health facilities were not chosen at random and not all of the facilities in the region were assessed. Information gathered through this assessment is not necessarily generalizable.

Qualitative methods

To explore social and structural factors influencing HIV-related vulnerability in the region and to assess the nature and content of current HIV prevention interventions in the region, we conducted qualitative research using both in-depth interviews and focus groups with a variety of populations. Between January and October, 2012, we conducted 123 individual, key informant and in-depth interviews and 8 focus group discussions with 67 participants for a total sample of 190 individuals.

In total, 123 interviews were conducted with a wide variety of community members, service delivery recipients, and other key informant opinion leaders. Criterion-based sampling was used to recruit individuals with specific characteristics of interest (specifically, individuals holding different types of local leadership positions, users of different HIV services, and members of specific populations at heightened risk of HIV, as described below); within each strata, maximum variation was sought in settings or experiences within that characteristic of interest (Patton, 1990). We aimed for at least 5-8 individuals within each strata, which has been recommended as a sample size guideline for stratified samples (Crabtree & Miller, 1992). Individuals were eligible to participate if they were at least 18 years of age, and were able to provide informed consent to participate in interviews. In addition, for service delivery users and members of populations at heightened risk for HIV infection, individuals had to self-identify as a member of a specific population or client of a specific HIV-related service. Key topic areas for each set of respondents (key informants, service delivery users, and populations at heightened HIV risk) were included in an interview guide, but interviewers were encouraged to probe on responses to pursue interesting and relevant topics that arose during the course of the interviews. The guides included questions on the HIV epidemic in Iringa, individual and structural challenges to utilizing services, and personal and professional experiences with HIV prevention-related issues. Interviews generally lasted about 1 hour. All interviews were conducted in Swahili or English, transcribed, and translated into English if necessary.

For key informants, 34 individuals were interviewed. We sought a diverse array of opinion leaders from positions of religious, socio-cultural, economic, political, and health-related leadership at the governmental, non-governmental, and community levels. The final sample of key informants included 7 health care workers, 6 religious leaders, 9 NGO workers, 6 government administrators, 2 village leaders,

and 4 other individuals. Interview guides sought to gain an understanding of the way in which opinion leaders in the region perceive and respond to HIV in their sectors.

For HIV-related service delivery users, 30 individuals were interviewed: 6 each from HIV testing and counseling (HTC), HIV care and treatment, VMMC, prevention of mother-to-child transmission (PMTCT), and gender-based violence services. Interview guides focused on understanding participants' experiences with and perspectives, both positive and negative, on these 5 key HIV-related services identified a priori in the region. Clients were sampled from a variety of facilities in multiple regions for each type of service. The only exception was gender-based violence clients, who were all sampled from the same NGO which was the sole provider of gender-based violence services in the region.

For populations at heightened risk for HIV infection, 59 individuals were interviewed. This included 10 sex workers, 10 truckers, 10 drug users, 9 men who have sex with men (MSM), 10 male plantation workers, and 10 female plantation workers. Interview guides covered experiences these individuals are facing; how they understand risk and HIV; their personal experiences with community groups and HIV prevention, care, and treatment services; the individual and structural level challenges to engaging in protective behaviors; and additional resources and support systems needed to protect themselves. Participants were recruited from a variety of venues and locations for maximum variation. For example, sex workers were recruited from multiple types of sex work venue including hotels, small restaurants/bars, modern bars, and local brew bars in both urban and rural settings in three districts. Plantation workers were recruited from different locations on both tea and timber plantations, while truckers and IDUs were recruited from various truck and bus stops in three different districts of the region.

As more information emerged on potential interventions that could help stem HIV-related risk in Iringa, it became clear that an intervention to address the socio-economic vulnerability of young women, particularly as it relates to transactional sex, was needed in Iringa. To further explore this topic, all interview participants were asked questions about a potential cash transfer intervention.

In addition to interviews, 8 focus group discussions (FGDs) with 67 individuals overall were held at a later stage in the project to further explore specific interventions which arose over the course of the study as potentially relevant for a future combination HIV prevention trial but were not covered in the initial interviews. Focus group participants were selected from those populations which would potentially benefit from the socio-economic and community-based interventions being considered (i.e., youth and female sex workers). Two focus groups were conducted with female sex workers to discuss potential interventions with them using an empowerment-based framework. One of these FGDs was conducted in Ilula town (Kilolo District) with 10 FSWs, while the second was held in Iringa town with 7 FSWs. The remaining 6 focus groups were conducted with youth to discuss potential socio-economic interventions. Three were conducted with young women (10 women in Iringa town, 7 in Mafinga town, and 10 in a plantation in Mufindi District) and 3 were conducted with young men (7 men in Mafinga town, 6 in Isele Village [Kilolo District], and 10 on a plantation in Mufindi District).

Qualitative data analysis was conducted through identification of recurrent patterns and themes in two ways. First, an early stage of qualitative data analysis was used to quickly synthesize broad patterns and themes from the data using regular debriefing sessions with interviewers. This discussion-based approach provided preliminary findings for rapid use and helped to facilitate an iterative process of data collection. Second, completed transcripts were analyzed following Crabtree and Miller's (1999) five steps in qualitative data analysis, or what they call the "interpretive process": (1) Describing, (2) Organizing, (3) Connecting, (4) Corroborating, and (5) Representing. Codes were applied to the text and organized using the computer software package Atlas.ti (version 5.2, Scientific Software Development GmbH, Eden Prairie, MN). Insights and connections made between themes were organized through memos and discussions between study team members.

Stakeholder engagement

The Iringa strategic assessment was conducted within an already existing network of USAID-funded projects and implementing partners and ongoing collaborative relationships between both USAID and Muhimbili University and regional and governmental officials. Members of the Iringa based JHU team met regularly with individuals and organizations from within this network as well as other service providers in the region and officials from local, regional, and national governments.

Implementing partners. Field staff in Iringa developed collaborative working relationships with representatives from all USAID-funded implementing partners as well as numerous non-USAID-funded groups that were also providing health services in the region. Iringa based JHU staff generally met with USAID-funded groups quarterly. These groups included: Tunajali (FHI/Deloitte), CTC, Jhpiego, Engender Health, AMREF, the CPSS-MSM (a country-wide MSM support group based in Dar es Salaam), PSI, Futures Group-Health Policy Initiative, Africare, FHI-ROADS, KKKT ELCT, Southern Highlands Participatory Organization, Tanzania Capacity and Communication Project (TCCP), etc. Iringa based JHU staff met with non-USAID-funded groups at least once and these groups included: CUAMM Doctors with Africa, Health and Agriculture Livelihood Initiative, Daraja Development, Restless Development, Fox's NGO's Orphans Village, Southern Highlands Participatory Organization, Karibu Tanzania Association, Wildlife Conservation Society, Tumbani University, Neema Crafts NGO, CPSS-MSM (in Dar), KKKT ELCT, Cheetah Development, and One Acre Fund. Meetings and visits were focused on gathering information (e.g., documenting prevention activities, observing ongoing prevention programming and visiting prevention care delivery sites) as well as sharing information (e.g., the development of recommendations for intervention activities for the proposed community randomized combination HIV prevention trial).

Local, regional and national governmental representatives. The JHU Iringa based team met at least quarterly with regional medical officials, including the Regional Medical Officer and the Regional AIDS Control Coordinator, to build rapport, foster collaborative relationships, provide updates on the proposed community randomized combination HIV prevention trial, ask for insights on the HIV epidemic in Iringa, and gain permissions for activities (e.g., visiting facilities). When non-Iringa based JHU or MUHAS staff visited Iringa, they also visited with local representatives and leaders. Before any formative work was conducted in the region, permission had to be gained from regional, district, ward, and village

leaders. Obtaining these written permissions was time intensive as it required considerable travel and numerous meetings to ensure that a positive working relationship was in place and that the proposed community randomized combination HIV prevention project including its purposes and associated needs had been clearly and thoroughly explained. There was a lot of turnover in the office of the Regional Medical Officer (RMO) and with each change in leadership, the Iringa field team met with the new or acting RMO to establish a new and collaborative working relationship. In addition to local meetings, Iringa based staff as well as non-Iringa based JHU and MUHAS staff met frequently with national government leaders. There was significant turnover at the national level as well, and with each change in leadership, JHU and MUHAS staff met with newly appointed leaders to explain and gather support for the proposed community randomized combination HIV prevention project. JHU and MUHAS staff met with the following government based organizations and groups: offices within the Iringa Regional Government and the Njombe Regional Government, the National AIDS Control Program (NACP), TACAIDS, and the Ministry of Health.

Primary Health Care Institute (PHCI). Another important early and ongoing stakeholder engagement activity was establishing a collaborative relationship with the Primary Health Care Institute (PHCI), a local research partner for the proposed community randomized combination HIV prevention trial. PHCI, MUHAS, and JHU worked together on a number of tasks including establishing a research infrastructure in Iringa and forming a community advisory board (CAB). The inaugural meeting of the CAB took place on November 20, 2012 and included community stakeholders such as traditional healers, representatives of religious institutions, people living with HIV, women, youth, and representatives from the media and local higher education institutions and businesses. The meeting was held in Swahili to achieve maximum comprehension and participation. At the meeting, the CAB chose a name for the proposed community randomized combination HIV prevention trial and engaged in conversations about designing and effectively communicating a cluster randomization plan.

SUMMARY OF FINDINGS

The Iringa strategic Assessment had three specific aims. Below we present a summary of findings for each aim followed by recommendations and conclusions.

Aim 1: To examine the role of structural, behavioral and biomedical factors in relation to HIV-related risk in Iringa

Aim 1.1: To assess factors associated with HIV infection in the region by gathering, analyzing, and synthesizing available HIV-related quantitative data, building on recent data triangulation efforts

Review of existing data including recent data triangulation efforts. The Tanzania Regional Triangulation, Mbeya and Iringa region, HIV/AIDS Data Synthesis Project (TACAIDS, 2011), conducted prior to this strategic assessment, concluded that no data existed on HIV incidence in Iringa, little data existed on HIV-related risks in Iringa, and that data on populations at heightened risk of HIV (especially tea plantation workers, truckers, and female sex workers (FSW) who work along the transit routes) was desperately needed. A review of published literature related to the Iringa region yielded no references regarding HIV. (Note: Since completion of the strategic assessment, Jhpiego and JHU each have articles in press regarding Iringa.) A review of reports from NGOs working in Iringa revealed that alcohol may be facilitating risk in Iringa, given that 38% of men and 37% of women interviewed in Iringa reported use of alcohol during last sexual intercourse in the past 12 months (NBS, 2011). Given the limited additional data identified beyond the previously conducted HIV/AIDS data synthesis project, we did not re-do the data triangulation exercises as we assumed the conclusions would remain unchanged.

DHS analysis

JHU's secondary analysis of 2007/08 THMIS data confirmed that HIV prevalence in Iringa was significantly higher than the combined prevalence of other regions in the country (15.7% vs. 5.23%, $p < 0.001$). Circumcision was also significantly lower in Iringa compared to other regions ($p < 0.001$), and women were significantly more likely to be HIV-infected than men ($p < 0.001$). HIV-infected individuals residing outside of the Iringa region were significantly more likely to be in the wealthier quintiles as compared to Iringa residents. In multivariate analysis adjusting for a variety of demographic and risk factors, individuals in the Iringa region had more than three times the adjusted odds of HIV infection compared to those in the rest of Tanzania (adjusted odds ratio [aOR]=3.54, 95% confidence interval [CI]: 2.1-5.9). In Iringa, individuals less than 20 years of age had almost six times the odds of being HIV-infected relative to those over 40 years of age (aOR=5.8, 95% CI: 1.5-22.7). This is different than in other regions of Tanzania where being 20 to 39 years was a significant risk factor. Additional risk factors for HIV infection in Iringa included having a greater than ten year age gap with a sexual partner (aOR=4.60, 95% CI: 1.2-17.6) and more than five lifetime sexual partners (aOR=8.20, 95% CI: 1.1-62.0).

Aim 1.2: To qualitatively explore social and structural factors influencing HIV risk in Iringa including mobility and migration, sex work, culturally-defined gender norms and practices, and other social norms including those associated with alcohol use

Mobility and migration

In qualitative research, mobility and migration were identified by participants as key aspects shaping HIV risk and vulnerability in Iringa. Migration for work on tea and timber plantations, mobility of truckers along the Tan-Zam highway, and migration of sex workers to and from the region were all described by participants.

Truck drivers interviewed in this study were generally aware of HIV and protective measures, although there were some myths about HIV, and most felt there was a need for education services, condom availability, and strategies to address environmental and structural risks for HIV among truckers. Drivers stated that their risk for HIV was directly related to alcohol consumption, social acceptance and peer pressure, lack of condoms, and sexual desire due to long periods of time spent away from their wives. Many described the truck stop environment as one filled with temptation and dangers where even those who do not want to have sex find it difficult to refuse the constant accessibility of women and their advances across different truck stops. These drivers would take steps to reduce temptation by not drinking or drinking in their trucks, placing family pictures on their phone or in the truck, calling their family frequently, and arriving at truck stops late enough that they were too tired to visit the bars or have sex. Despite awareness of HIV risk and knowing they might engage in risk behaviors when consuming alcohol, most drivers did not carry condoms or take measures to look for condoms before having sex. In situations where drivers had sex with the same casual or non-spouse partner more than once, they were likely to discontinue using condoms due to trust and familiarity. Drivers offered recommendations for providing services with truck drivers including providing services at times when drivers are available and on-site, as well as actively reaching out to truck drivers in multiple formats and places and providing condoms at times and places where they were needed.

Plantation workers described several factors that may increase HIV risk and vulnerability. First, the widespread use of alcohol was commonly mentioned as a significant driver of HIV infection among plantation workers. Almost all participants mentioned that drinking traditional alcohol was a very common practice and often impaired people's judgment, leading to unsafe sexual intercourse, which was widely acknowledged to cause HIV transmission. Participants mentioned that excessive alcohol use was most common when workers received their monthly salary and left the plantation to go to nearby towns and villages. Some participants discussed boredom and the lack of other recreational activities as a reason for this type of alcohol use. In addition to alcohol use as a risk factor for HIV, one female tea plantation worker stated that gender-based violence occurred on the plantations, explaining that female workers were forced to have sex with their male superiors in order to keep their jobs or be given priority assignments.

Sex work

In Iringa, sex work occurs in a variety of venues, including *baa* ("modern" bars), *vilabu* ("local" bars), and *grosary* (small restaurant/bars). Sex workers are also found in discos, guesthouses, hotels, and brothels

(*madanguro*). Alcohol is common to all of these venues and was a key factor shaping risk. Sex work is both criminalized and highly stigmatized in Iringa. Sex work is also commonly blamed for the high prevalence of HIV in the region, with both FSWs and key informants describing sex work as placing women at risk of HIV. Sex workers described violence from clients and regular partners, but not from police in this setting. Many FSWs experienced migrancy and movement, sometimes for marriage or work, and sometimes to specifically follow the movements of potential clients during seasons when they had more money to pay for sex work. FSWs described some misperceptions about HIV, including the idea that HIV transmission can only occur in the presence of visible *michubuko* (abrasions or sores caused by friction).

Gender norms and practices

Across a wide variety of participants, including both key informants and community members, we heard consistently that poverty and cultural norms led young women in Iringa to engage in transactional and cross-generational sex. Many participants said that men, particularly older men, were able to provide young women with clothing, food, school fees, and other items which they were unable to purchase themselves due to their own and their families' poverty. Participants also described a spectrum of reasons for engaging in transactional sex, from women who were unable to meet their basic needs to women who were not truly impoverished, but who had a desire for material goods. Engaging in this type of cross-generational transactional sex was seen as culturally normative in many ways, although it was also somewhat unaccepted and therefore hidden. These relationships also often occurred in the context of concurrent partnerships.

Alcohol use

Another factor influencing HIV-related vulnerability in the region was alcohol use. In qualitative interviews, an ethnomedical model of how alcohol causes HIV emerged. Participants reported that Iringa residents drank more often and in larger quantities than people in other regions; drinking was almost always done to get drunk, and excess drinking often led to unprotected sex. If the regular partner was absent, sex was often initiated with other partners. Having unprotected sex was viewed as a necessary and direct consequence of alcohol consumption. These reported behaviors suggest that excess alcohol use often leads to risky behaviors that could increase the risk of HIV infection.

Men who have sex with men (MSM)

It was difficult to identify and engage with MSM in Iringa. However, after working with a Dar es Salaam-based organization that was able to leverage peer networks and build local trust as members of the same group, we were able to interview nine MSM in Iringa. MSM reported living in an environment of significant stigma and discrimination and attempted to hide their same-sex behavior from almost everyone in their lives and communities. However, they did describe HIV risk behaviors, including engaging in unprotected anal sex with multiple casual and steady partners, having untreated STIs, and having little or no access to lubricants. Men had some familiarity with condoms, but there was uncertainty and confusion about the HIV risk of anal sex, and a general distrust of condoms. Some men had paid sex, where the paying partner controlled condom use. Men expressed consistent fears of family, social, and community exclusion should their sexual orientation and/or sexual behaviors be

disclosed. Men both felt excluded and actively excluded themselves from health care, including HIV and STI care, for fear of disclosure and social harm as well as past experience with unfriendly workers. There was little evidence of formal organization among MSM, and quite modest informal networking among MSM.

Other social norms that shape HIV risk

Other social norms and local practices appeared to shape HIV risk in the region. Traditional medicine and faith-based healing practices were reportedly common. Traditional healers and faith-based healers were both used by many Iringa residents, including PLHIV. Traditional healers were visited both within the Iringa region and outside the region. For example, several participants mentioned Baba Lusondo, a traditional healer in Arusha who provides a “cup” for PLHIV to drink from. Despite the long distance from Iringa to Arusha, several participants said that they themselves or other Iringa residents make this trip based on their belief in the healing power of Baba Lusondo’s cup.

In addition, Iringa is not a traditionally circumcising region. Because of this, circumcision was associated with Islam for many Iringa residents. Others simply felt that circumcision was not something that was traditionally done in their community, which thus made them reluctant to be circumcised in VMMC campaigns.

Aim 2: To assess the current scope, nature, and costs of HIV prevention services and interventions in Iringa

Aim 2.1: To further examine the current level of HIV prevention intervention coverage across the region, building on recent service coverage mapping efforts

Service sites

Our mapping of services broadened the number and refined the reach of the service delivery sites (i.e., sites that provided at least PMTCT) originally identified by MEASURE in an area that was within a 1.5 hour radius from Iringa town. In this area, we found 43 sites in addition to the 98 sites originally identified by Measure. Two of these sites were new sites that had been constructed in the period after Measure’s mapping and before our assessment. We were able to provide greater accuracy on exact GPS coordinates for all service sites and improved the measurement of facility catchment areas. In JHU’s revised list of sites, all villages in the targeted area were shown to access services and the greater distance individuals within a village might travel to reach services was documented. (Note: Data from the Measure Evaluation did not provide information on costs.) JHU’s mapping of all services in the evaluation area was supplemented by solicitations to government partners and NGOs in the region for information on service delivery and intervention coverage. We received ANC data for every facility in the evaluation area as well as some additional data from government offices at the regional, district, ward and village level. A listing of the 141 sites as well as a map of the clusters within which they were located is available upon request.

Coverage

Coverage rates were difficult to generate given difficulties in understanding the denominator, or the true total number of HIV-infected individuals. For example, for many services HTC or ART, numbers provided by implementing partners reflected total numbers of tests or total numbers of medicines distributed as opposed to how many individuals had received a test or were on sustained treatment. At the same time, coverage of services like circumcision where total number reached was easier to quantify was also difficult to assess given poor population data such as decade old census projections. Finally, a lack of a coordinated, integrated electronic data system made synthesis of service and coverage data at the service site, cluster, village, ward, district, and regional levels challenging.

Despite these obstacles, a review of reports from implementing partners and APR and SAPR data where available revealed information about service coverage described below.

Targeted Services

Voluntary male medical circumcision: Jhpiego serves as the primary implementing partner for VMMC services and is using the models-for-optimizing-volume-and-efficiency (MOVE) approach to improve program efficiencies. Mobile and permanent VMMC programs exist in Iringa. In 2010 and 2011, Jhpiego conducted two successful VMMC campaigns (over 10,000 men circumcised) in Iringa and Njombe and VMMC services were recently established in the Iringa Regional Hospital. In rural areas of Iringa, circumcision is provided at existing clinics or often in association with a school. Jhpiego's minimum VMMC package includes HIV testing and counseling (HTC), promoting and providing condoms, and counseling for HIV risk reduction. HTC uptake has been nearly universal in the MMC service-delivery model utilized by Jhpiego to date in Tanzania. It is estimated that 15.2% of men aged 15-49 have been circumcised in Iringa and 3.5% of men aged 15-49 have been circumcised in Njombe. Older men have been identified as refractory to MMC, perhaps due to the age composition of boys and men coming forward for services (where extremely low participation is seen in men older than 25 years). Iringa urban and Mufindi districts have the highest rates of people on treatment and VMMC clients.

HIV Testing and Counseling: Currently, HTC programs are being implemented in Iringa by AMREF, Jhpiego, Deloitte Care and Treatment, and Deloitte Home Based Care Programs. AMREF is providing HTC for static, mobile, and hard to reach groups through its ANGAZA/ZAIDI program. Jhpiego, through their UHAI-CT project, will be implementing and scaling up mobile testing, provider-initiated testing and counseling (PITC), and outreach services to underserved populations and key populations through contracted civil society organizations. Deloitte Care and Treatment provides support to clinic and non-clinic based treatment, care, and support programs. In all districts other than Kilolo, men are more likely than women to test for HIV. Iringa urban and Kilolo have the highest rates of HIV testing while Iringa rural has the lowest testing rates.

Prevention of Mother-to-child Transmission (PMTCT): AMREF works with the Iringa Municipal Council and the Iringa Municipal Counseling Center (IMCC) to provide HTC, PMTCT and HIV treatment services. EngenderHealth, through the Access, Quality, and Use in Reproductive Health (ACQUIRE) project, is promoting increased uptake and coverage of PMTCT services in the region. Deloitte provides PMTCT

services in the Iringa region through Tunajali. It is estimated that 15.2% of women aged 15-39 in Iringa and 14.3% of women in Njombe are tested for HIV through PMTCT.

HIV knowledge: Several groups have been involved in promoting greater awareness around HIV/AIDS in Iringa, as well as specifically promoting the reduction of multiple and concurrent sexual partnerships and the use of condoms. Through both its Strategic Radio Communication for Development (STRADCOM) project and its JHU/TCCP project, JHU has used mass media including radio programming and community-based behavior change communication efforts to address social and behavioral factors associated with HIV in Tanzania. PSI, via its TMARC project, is implementing a condom social marketing program in the region targeting hot spots and venues where higher risk sex is understood to occur including bar and truck stops along highways and other venues where commercial sex is found.

Age at sexual debut and sex with older partners: Family Health International (FHI) has a youth-focused HIV prevention project in Tanzania called UJANA, the Swahili word for "Youthfulness." UJANA seeks to help youth develop skills to abstain from or delay sex, remain faithful to one partner if engaged in a relationship, reduce their number of sexual partners, or if appropriate, use condoms. JHU/STRADCOM radio programming has also specifically targeted youth using entertainment education methods to promote HIV prevention.

Gender norms and gender-based violence: Data from TACAIDS (2008) estimate that 15% of women in Iringa and 10.4% of all women in Tanzania experienced forced intercourse at sexual debut. EngenderHealth is currently implementing the CHAMPION program, which promotes a national dialogue about men's roles and aims to increase gender-equitable beliefs and behaviors. The CHAMPION program promotes partner reduction, fidelity, and reduced sexual risk behavior. It creates an enabling environment that promotes positive social norms including non-violence and respect for healthy relationships; mobilizes workplace environments (including plantations) to advance gender equity and male engagement to prevent HIV and promote reproductive health; and develops strategies to strengthen laws and policies that engage men in preventing HIV infection to reduce the risk in men and women.

Treatment: Africare (PAMOJA) and Deloitte (TUNAJALI) are providing HIV care and treatment for PLHIV living in Iringa. In all districts in Iringa, women are more likely to be on ARVs than men. Iringa urban and Mufindi districts have the highest rates of people on treatment. It is estimated that 18.4% of treatment eligible men and 31.1% of treatment eligible women in Iringa are receiving ART and that 7.4% of treatment eligible men and 12% of treatment eligible women are receiving ART in Njombe.

Key Populations

Migrant and mobile populations: FHI is implementing the Regional Outreach Addressing AIDS through Development (ROADS) II project to promote HIV prevention among mobile populations including truckers and transport workers, particularly along main highway routes in Iringa. Additionally, groups such as EngenderHealth and Jhpiego are working to promote equitable gender norms and access to HTC, ART, and PMTCT among plantation workers.

Female sex workers: In Iringa, the PSI TMARC project has been implementing condom social marketing efforts in hotspots and venues such as bars and brothels where sex work occurs. Another project, HUSIKA, which is being coordinated by PSI in conjunction with local partners, will expand services for sex workers to include peer education, condom distribution, and access to HIV/STI screening, treatment, and care.

Men Who Have Sex with Men: There are no known HIV-related interventions for MSM in Iringa to date.

Facility assessment

Findings from the facility assessment, which was conducted by a collaborative team of representatives from Jhpiego, USAID, JHU, Muhimbili University, and the Tanzania Ministry of Health, were disseminated to regional, district, and ward stakeholders at a meeting in Iringa on April 2, 2013. At this meeting, the following findings were presented:

- Quality assessment visits by regional teams were only being conducted in 13 out of the 88 facilities
- All but the Iringa Municipal District were very short-staffed
- Only 36% of facilities had HIV test kits in stock
- Over half of the facilities were facing stock outs of essential HIV testing supplies (gloves, syringes, lancets, tourniquets)
- Facilities reported very low numbers of provider-initiated testing and counseling
- Facility catchment areas were much larger than had been reported by MEASURE

Aim 2.2: To assess the nature and content of current HIV prevention interventions in the region

HTC services

Overall, respondents appeared to be fairly well informed about HTC and the importance of knowing one's HIV status, and most knew where HTC services could be obtained. Even some truckers were able to state that HTC was available at the district hospital. Although long distances to testing facilities were identified as a barrier to HTC by some respondents, others argued that it was preferable to visit HTC centers located further away to better ensure privacy. Long wait times to receive HIV test results were also mentioned by some participants.

One of the most significant barriers to HTC was lack of test kits at health facilities in and around the region. The shortage of test kits meant that providers would refer clients to other facilities for testing, leading to potential loss of HTC clients even if test kits were available elsewhere.

HIV care and treatment services

For people who test positive, HIV care and treatment services were generally well regarded in the region. Both PLHIV as well as other respondents viewed ART in highly positive terms and considered it highly efficacious. PLHIV were particularly satisfied with services provided by private clinics, such as DREAM and ALAMANO, where they felt that they were treated well by staff and their needs were fully addressed. However, respondents did report lingering misconceptions about ART in their communities.

Many respondents commented on free provision of ART as a major facilitator of treatment, and they also appreciated programs providing financial aid for PLHIV that helped to fund nutritious food or travel to appointments, particularly from plantations.

Distance to clinics and associated transportation costs were reported as the main barriers to accessing HIV care and treatment; costs for medications and supplies at the clinics were also reported. However, once accessed, participants reported structural challenges getting the care they required. Respondents reported that few facilities provided ART and there were often shortages of medications such as co-trimoxazole. CD4 testing equipment was often unavailable, broken, or missing necessary supplies, and facilities often had challenges providing other services such as X-rays. Finally, respondents reported that there were an insufficient number of providers, leading to long wait times at health care facilities.

Voluntary medical male circumcision (VMMC) services

VMMC roll-out has been highly successful in Iringa. Among our participants there was almost universal acceptance of the idea that circumcision reduced HIV transmission, and respondents praised the communication campaigns surrounding VMMC roll-out. Although there remained individual and cultural reasons why some men remained hesitant to be circumcised, these were rarely related to the nature of the existing services. However, long waiting times, the mixing of older and younger men in queues, and the perception of corruption and bribes were some of the service-related barriers to increased uptake of VMMC.

Health systems issues

A few participants mentioned unprofessional behavior displayed by health care providers as discouragement for seeking services. Sometimes this was specifically mentioned as a barrier for particular populations, such as drug users for HTC, and PLHIV for care and treatment services. Conversely, some respondents praised the quality of service provision, particularly for VMMC services and at private HIV care and treatment clinics.

Plantation workers

Plantation workers discussed HIV services and programs provided by their workplaces that promote HIV prevention and treatment. For example, participants noted that they received education in the form of seminars and dance troupes while they waited in line for their salaries each month. Condoms were widely distributed and available for workers, and mobile HIV testing and counseling services were offered at convenient locations around the plantations. The Unilever plantation offered a free bus service once a week which takes employees to receive HIV care and treatment services, workers mentioned that they received paid time off to attend medical appointments, and supervisors discussed how they allowed HIV-infected workers who were sick to perform alternate, less strenuous tasks. These programs were mentioned by multiple participants and seemed to increase acceptance of HIV services. In addition, multiple participants discussed that they had witnessed the transformative effect of ART on colleagues who were once too sick to work and now functioned at the same level as other employees, which provided motivation for people to be tested and receive treatment.

Female sex workers

FSWs said they were afraid of being stigmatized or treated poorly at clinics. There were few reports of actual discrimination, however, likely because FSWs did not disclose their occupation to health care workers. There are no dedicated services for FSWs in Iringa, and no providers reported being trained to specifically meet the needs of FSWs, although EngenderHealth is developing training manuals for health care workers to meet the needs of key populations, including FSWs. Many services were focused on couples and married women, including family planning services, provider-initiated HIV testing in antenatal care, and gender-based violence services. FSWs said these services did not meet their needs as single women. However, some did report receiving STI treatment and reproductive health care from clinics that were reportedly friendlier to FSWs. Targeted outreach services were provided by PSI, which conducted education, condom demonstrations, and condom social marketing at evening music events, and Jhpiego's UHAI-CT program, which provided nighttime HIV testing and counseling at sex work venues.

Aim 3: To identify gaps and provide recommendations to strengthen the HIV prevention response in Iringa

Aim 3.1: To assess the alignment between current HIV prevention programming and key factors found to be linked to HIV transmission dynamics in the region in terms of the geographic reach and population coverage of services and intervention content

Drawing from findings presented in Aims 1 and 2, we identified ways in which the current HIV-related programming in Iringa could be better aligned to address the specific dynamics of the HIV epidemic in the region. We present these gaps and recommendations divided into geographic reach, population coverage, and intervention content.

Geographic reach

Distance to services was a common barrier to increased access to HTC, HIV care and treatment, and VMMC services. The barrier of distance to service can be ameliorated in different ways. One way is to expand service availability. This can be a costly solution, however, in terms of financial resources, human resources (such as health care providers), physical resources (such as buildings), and supplies and equipment (such as laboratory tests and machines). It is therefore a less than ideal solution in a resource-constrained environment such as Iringa. Expansion of outreach efforts is another alternative that may be better suited to Iringa where success has already been realized in HTC and VMMC service outreach.

Health systems strengthening

Quantitative and qualitative data collection highlighted the major ongoing challenge of stock-outs of HIV test kits and assays. These presented one of the largest barriers to initiating effective, comprehensive and sustained care in Iringa. Similarly, challenges such as non-functional CD4 testing equipment or shortages of medications such as co-trimoxazole were identified as primary barriers to care. Ensuring continuous availability of HTC kits, ART, and related drugs and assays is critical. In some services, poor treatment by health care workers was identified as a reason why individuals did not seek care, or did not

remain in care, at these facilities. In turn, sensitivity training for HIV-related health care providers in the region to address issues of stigma and discrimination appears to be a key need.

Staff shortages are also an issue for service delivery in Iringa. Task-shifting may be a potential solution for certain key services such as HTC. Currently, Tanzania only allows clinical personnel to conduct HIV testing. Eliminating this restriction, for example, and task-shifting to lower-skilled providers could reduce demands on higher-level providers and make HTC more widely available in lower-level facilities and through outreach services.

Underserved populations

Findings from this assessment identified several specific populations that may be at greater risk of HIV infection and that may not be adequately covered by existing interventions and services. These include older men who all currently do not access VMMC services, younger women, and key populations.

Older men: Our assessment suggests that circumcision services are not adequately reaching older men, who may be at heightened and more immediate risk of HIV infection, and that VMMC services can take a variety of approaches to attract older clients. For example, separate service provision for different age ranges and hiring older men as providers might both be useful approaches. Further, messaging should continue to shift from a sole focus on preventing HIV transmission to a more comprehensive message that highlights other associated benefits of circumcision for general health, cleanliness, and well-being.

Younger women: Findings from the DHS analysis suggest that young women in Iringa are particularly vulnerable to HIV, and qualitative findings helped to explain the dynamics of transactional and cross-generational sex that contribute to this vulnerability. Few HIV prevention services in Iringa target young women, and in particular, the economic and cultural vulnerability that leads to transactional and cross-generational sex. Girls lack access to material resources such as cash, credit, and/or loans and this assessment suggests that interventions addressing this need may have an impact on pathways between poverty and sexual risk behavior. Potential acceptable interventions include cash transfer programs (either conditional or unconditional), life skills programs, programs to encourage gender norms transformation, financial support for girls' education, vocational training, and entrepreneurial/business training.

Key populations: Certain key populations and populations at heightened risk for HIV in this setting do not have adequate access to appropriate services. These populations include female sex workers, truckers, and plantation workers, all of whom may play a key role in the epidemic in the Iringa region. Additionally, MSM are highly stigmatized which complicates any potential initiative to reach them with preventive services.

Conceptual Model

Our conceptual model (Figure 1) brings together findings from Aims 1, 2, and 3 to show a potential combination prevention package including a set of inter-related biomedical, behavioral, and structural interventions to address the factors shaping HIV-related risk and vulnerability in Iringa in order to reduce HIV acquisition and transmission among both men and women. This conceptual model draws

from three key aspects of combination HIV prevention: (1) Focus – Targeting efforts towards proven interventions and key populations; (2) Synergy – Creating links and synergy across interventions for true combination approach; and (3) Facilitation – Reducing barriers to uptake of services. In addition, we recommend that these services be brought to adequate scale and coverage (although this is not visually depicted in the model). It addresses HIV risk factors at multiple levels by reducing structural vulnerability, which drives individual-level risk behavior, and reducing biological vulnerability.

The conceptual model starts with a broad and overarching focus on social and behavior change communication and health systems strengthening. Social and behavior change communication across all topics and interventions in the model is needed to support healthy community norms to reduce HIV risk and to increase awareness of, acceptability of, and demand for different services. If social and behavior change communication is able to generate strong demand for services, the resulting supply of services must be strong and consistent enough to meet demand and ensure quality. This is accomplished through health systems strengthening. Health systems strengthening in this model includes strengthening commodities supply chains to reduce stock-outs of medications and diagnostics, such as HIV test kits; ensuring a sufficient number of providers to provide services and considering task-shifting to ensure coverage of key services when the number of trained providers is insufficient; and training providers in non-stigmatizing and patient-centered approaches to service provision. Together, these elements support the existence of sufficient quality and quantity of services.

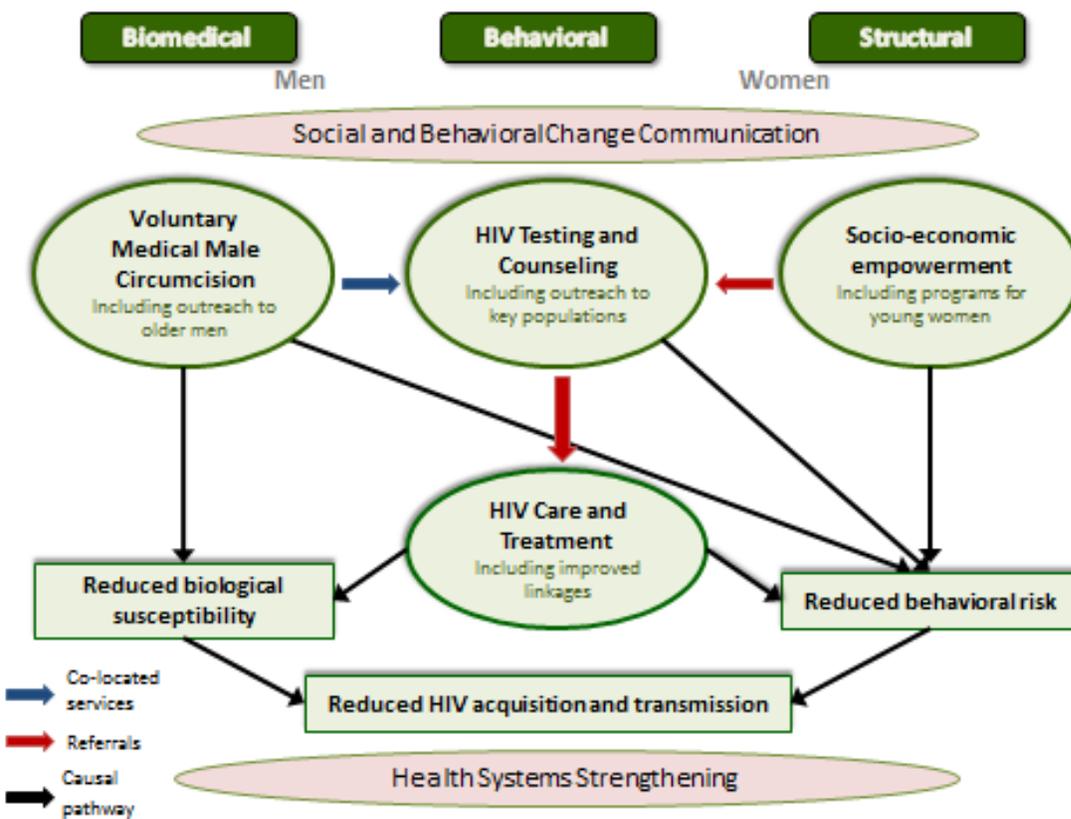
The model then lays out four key interventions to reduce HIV incidence in Iringa: VMMC, HTC, socio-economic empowerment, and HIV care and treatment. Each of these interventions includes a focus on a specific population to target for HIV risk reduction. VMMC targets men, and in Iringa specifically, should focus on outreach to older men. HTC in Iringa should include targeted outreach to populations at heightened risk of HIV such as sex workers, truckers, and migrant workers. Socio-economic empowerment addresses the specific vulnerability of young women in this setting. HIV care and treatment targets PLHIV, and this intervention is optimized through improved linkages to care and ART initiation, as well as point of care CD4 counts and positive health, dignity and prevention interventions that complement drug therapy to address the variety of psychosocial, physical, prevention, and advocacy needs of PLHIV.

These four key interventions, targeted to specific populations identified as particularly vulnerable and in need of each service in the region, are linked together through co-located services (HTC at VMMC sites) and through referrals (referrals to HTC from socio-economic empowerment interventions and referrals to HIV care and treatment from HTC).

These interventions influence HIV acquisition and transmission through two pathways: reduced biological susceptibility and reduced behavioral risk. VMMC reduces biological susceptibility to HIV for circumcised men, while ART reduces infectivity of PLHIV on treatment, thereby reducing transmission of HIV to their sexual partners. All four interventions potentially shape behaviors that may reduce HIV transmission and acquisition. VMMC and HTC include behavioral risk reduction counseling meant to reduce HIV acquisition among recipients. Positive health, dignity and prevention programs associated with HIV care and treatment also provide supportive risk reduction counseling, but in this case, to PLHIV

in order to reduce the likelihood that they will transmit HIV to others. Socio-economic empowerment interventions may include risk-reduction counseling as well, but are intended to reduce behavioral risk through reducing young women’s economic dependence on older men and transactional sex that may make them particularly vulnerable to HIV acquisition. The conceptual model then shows how reduced biological susceptibility and reduced behavioral risk engendered by these interventions leads to reduced HIV acquisition and transmission.

Figure 1. Conceptual model of potential combination prevention package including biomedical, behavioral, and structural interventions to reduce HIV among women and men in Iringa



STRENGTHS AND LIMITATIONS

The Iringa strategic assessment had several strengths and limitations which should be considered when interpreting these findings.

Strengths of the study include its broad scope, covering a wide range of factors shaping HIV risk in Iringa as well as potential interventions—biomedical, behavioral, and structural—to address those factors. Qualitative research was conducted with a wide variety of individuals, including those who are currently responsible for HIV-related programming in the region, clinicians, and community leaders, as well as current recipients of a range of HIV-related services and individuals at heightened risk and vulnerability for HIV in the region. This included interviews with populations such as MSM, who, to our knowledge, have never before been included in public health research in the region.

There were also some limitations to this study. Quantitatively, we were only able to make use of existing data sources. The DHS data included a small sample size for Iringa specifically, limiting power for regression analyses. We also encountered significant challenges accessing program data relevant to the aims of this strategic assessment. Finally, accessing some key populations, such as MSM and drug users, was much more difficult than we had expected. Although qualitative research is not intended to be generalizable, participants from these groups may be particularly non-representative of these populations.

Despite these limitations, our findings contribute to a richer and more systematic understanding of the multi-faceted factors shaping HIV risk in Iringa, Tanzania and how policies and programs can be expanded and better tailored to address these factors for maximum HIV prevention benefit.

The process of conducting this strategic assessment was also slowed by several factors. First, obtaining existing data from local organizations as well as identified partners in the region was a more difficult and time-consuming process than originally envisioned. Obtaining ethical clearance and stakeholder support was also more complex and took more time than planned. Changes in governmental leadership, for example, entailed scheduling additional visits and presentations which led to inevitable but necessary delays. Once formative work was approved, there were difficulties in reaching certain key populations and this too required necessary and delicate work on the ground level. Recruitment of MSM, for example, took many months longer than originally planned, as extensive community engagement was required for this hard-to-reach population. We also spent significant time and effort doing community-based work to identify injection drug users. Finally, data from this study were originally designed to be used to inform the interventions in the larger combination prevention trial. When that original purpose was no longer relevant, it took some time to reconceptualize and reconfigure the format for presenting these data to make them most useful to a variety of stakeholders. Combined, these factors challenged the team's ability to adhere to elements of the original proposed timeline. However, these delays did feed into important knowledge about the challenges working with certain key populations in the region which have never been included in research previously. This information will be useful for planning future studies and interventions in this area of Tanzania.

CONCLUSIONS

Our strategic assessment revealed gaps and vulnerabilities related to HIV infection in terms of the coverage and quality of prevention, care, and treatment services in the region as well as the social context surrounding HIV risk behaviors and dynamics associated with specific vulnerable populations. Addressing the multifaceted and multi-level nature of the increased risk to HIV infection experienced in Iringa will require significant resources (both financial and human), innovation in approach to meet the needs of currently underserved geographic areas and population groups, and a strong partnership between governmental and non-governmental organizations working in the Iringa region and beyond. Lastly, the Iringa strategic assessment sheds light on how innovations in HIV prevention science can only be realized if the larger structural and social context within which they are to be rolled out is addressed.

Following this Summary of Findings, we present more detailed findings from the Iringa strategic assessment analyses relevant to the key interventions and population groups depicted in the conceptual model above. These include VMMC, HTC, HIV care and treatment, linkage to care, socio-economic empowerment interventions for young women, and interventions with female sex workers (Research to Prevention, 2013a-f).

REFERENCES

- Crabtree, B. F., & Miller, W. L. (1999). *Doing Qualitative Research. 2nd ed.* Thousand Oaks, CA: Sage Publications.
- Geis, S., Maboko, L., Saathoff, E., Hoffman, O., Geldmacher, C., Mmbando, D., ... & Hoelscher, M. (2011). Risk factors for HIV-1 infection in a longitudinal, prospective cohort of adults from the Mbeya Region, Tanzania. *J Acquir Immune Defic Syndr*, doi:10.1097/QAI.0b013e3182118fa3.
- Jhpiego. (2010). *HIV Prevention Campaign Saves Thousands of Lives in Tanzania: Jhpiego program provides services to more than 10,000 men.* Retrieved on September 24, 2010 from: <http://www.jhpiego.org/media/releases/nr20100811.htm>
- National Bureau of Statistics (NBS) [Tanzania] and ICF Macro. (2011). *Tanzania Demographic and Health Survey 2010.* Dar es Salaam, Tanzania: NBS and ICF Macro.
- National Bureau of Statistics (NBS) [Tanzania], Ministry of Planning, Empowerment and Economics (MPEE). (2010). *Tanzania HIV/AIDS Indicator Survey 2003/04.* Dar es Salaam, Tanzania: NBS and MPEE.
- Patton, M. (2001). *Qualitative research and evaluation methods.* Sage Publications; Thousand Oaks, CA.
- PEPFAR. (2006). *The U.S. President's Emergency Plan for AIDS Relief: Fiscal Year 2006 Operational Plan August 2006 Update.* Retrieved from: <http://www.pepfar.gov/about/77643.htm>
- Research to Prevention. (2013a). *Iringa Strategic Assessment Brief: HIV Testing and Counseling.* Baltimore: USAID | Project Search: Research to Prevention. Available at: www.jhsph.edu/r2p
- Research to Prevention. (2013b). *Iringa Strategic Assessment Brief: Linkages to Care.* Baltimore: USAID | Project Search: Research to Prevention. Available at: www.jhsph.edu/r2p
- Research to Prevention. (2013c). *Iringa Strategic Assessment Brief: HIV Care and Treatment.* Baltimore: USAID | Project Search: Research to Prevention. Available at: www.jhsph.edu/r2p
- Research to Prevention. (2013d). *Iringa Strategic Assessment Brief: Voluntary Medical Male Circumcision.* Baltimore: USAID | Project Search: Research to Prevention. Available at: www.jhsph.edu/r2p
- Research to Prevention. (2013e). *Iringa Strategic Assessment Brief: Structural Interventions for Young Women.* Baltimore: USAID | Project Search: Research to Prevention. Available at: www.jhsph.edu/r2p

Research to Prevention. (2013f). *Iringa Strategic Assessment Brief: Female Sex Workers*. Baltimore: USAID | Project Search: Research to Prevention. Available at: www.jhsph.edu/r2p

Tanzania Commission for AIDS (TACAIDS). (2011). *Tanzania Regional Triangulation Mbeya and Iringa Region HIV/AIDS Data Synthesis Project: Final Report*. Dar es Salaam, Tanzania: TACAIDS.

Tanzania Commission for AIDS (TACAIDS), Zanzibar AIDS Commission (ZAC), National Bureau of Statistics (NBS), Office of Chief Government Statistician (OCGS), and ICF International. (2013). *Tanzania HIV/AIDS and Malaria Indicator Survey 2011-12*. Dar es Salaam, Tanzania: TACAIDS, ZAC, NBS, OCGS, and Macro International Inc.

Tanzania Commission for AIDS (TACAIDS), Zanzibar AIDS Commission (ZAC), National Bureau of Statistics (NBS), Office of the Chief Government Statistician (OCGS), and Macro International Inc. (2008). *Tanzania HIV/AIDS and Malaria Indicator Survey 2007-08*. Dar es Salaam, Tanzania: TACAIDS, ZAC, NBS, OCGS, and Macro International Inc.