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# A Social Ecological Approach: Understanding the Factors Associated with HIV Risk in Fishing Communities in Lake Victoria, Uganda.

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A Social Ecological Approach:  
Understanding the Factors Associated with HIV Risk in Fishing  
Communities in Lake Victoria, Uganda.

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B.A., Boston University, 2010

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A Social Ecological Approach:  
Understanding the Factors Associated with HIV Risk in Fishing  
Communities in Lake Victoria, Uganda.

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### ABSTRACT

Uganda has an estimated 1.4 million Human Immunodeficiency Virus (HIV) - positive adults (United Nations Program on HIV/AIDS [UNAIDS], 2011). The initial cases of acquired immune deficiency syndrome (AIDS) in Uganda were identified in fishing villages on the shores of Lake Victoria in 1985 (Serwadda et al., 1985). Fishing villages continue to remain at high risk of HIV transmission (United Nations Program on HIV/AIDS [UNAIDS], 2012). Evidence suggests that the HIV- prevalence rates among fishermen and commercial sex workers (CSWs) in the Wakiso District are more than 20 percent (Alex, Michael, & Nordin, 2011). The purpose of this study was to understand the factors associated with HIV risk in fishing communities in the Wakiso District of Lake Victoria in Uganda using the social ecological model (Stokols, 1995). Eight focus groups (n=50) were conducted to understand the dynamics of these communities in Lake Victoria, Uganda. The focus groups were composed of six or seven individuals. Two focus groups were conducted with fishermen, fishmongers and alcohol sellers. One focus group was conducted with commercial sex workers and one other focus group was with restaurant owners. The data showed that negative health behavior factors were present at all levels of the social ecological model (intrapersonal, interpersonal, community, & policy) in the fishing communities and are a driving force in the increased HIV risk of individuals. Understanding these social ecological factors can guide targeted multi-level interventions to achieve a decrease in new HIV infections in fishing communities.

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### INTRODUCTION

Uganda has an estimated 1.4 million HIV - positive adults with the first cases of AIDS identified in fishing villages on the shores of Lake Victoria in 1985 (UNAIDS, 2011; Serwadda et al., 1985). To date, fishing villages remain at high risk of HIV transmission (UNAIDS, 2012). Evidence suggests that the HIV-prevalence rates among fishermen and commercial sex workers (CSWs) in the Wakiso District are more than 20 percent (Alex, Michael, & Nordin, 2011).

Uganda is one of the rare high-success stories in sub-Saharan Africa because of its significant reduction of HIV transmission (Ministry of Health [MoH]-Uganda, 2009; UNAIDS, 2011). In the 1990's national HIV rates were at 15 percent and have since been reduced to a prevalence rate of approximately 7.3 percent (MoH-Uganda, 2009; UNAIDS, 2011). However, recent data shows a change in this trend: HIV rates are on the rise in specific populations (Shafer et al., 2006; UNAIDS, 2011). Only recently have these specific populations (CSWs and fishermen) begun receiving attention from Ugandan public health authorities to address their high HIV risk (Uganda AIDS Commission [UAC], 2007). Ugandan public health authorities have identified that both commercial sex workers and fishermen do not benefit from general HIV prevention programs (UAC, 2011). A study conducted by Alex, Michael, & Nordin (2011) in the Wakiso District found that of those surveyed in the fishing community, about 22 percent were HIV positive. Women had higher prevalence (25.1 percent) than men (20.5 percent), and HIV prevalence was highest among widows/widowers (40 percent) followed by divorced individuals (32 percent) (Alex, Michael, & Nordin, 2011). Additionally, HIV prevalence was higher among those who reported three or more lifetime sexual partners, compared to those who reported one or two lifetime sexual



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partners. The highest HIV rates were among individuals who reported having had their first sexual partner before the age of 15 (prevalence was 36 percent in women, 21 percent in men, & 30 percent in both women and men) (Alex, Michael, & Nordin, 2011).

Fishing communities in Lake Victoria have high occupational risks which further impact the community's HIV risk (Grellier, Tanzarn, Lamberts, & Howard, 2004). Occupational risks include remote geographic location, limited access to health care, & mobile lifestyle (Grellier, Tanzarn, Lamberts, & Howard, 2004; Gysels, Pool, & Nnalusiba, 2002). Living in a remote geographic location negatively affects access to health services and work safety regulations, which in turn increases occupational and HIV risks. Furthermore, the lack of sexual health knowledge and a highly mobile lifestyle limits education or proper health services. Compared to the over 80 percent national average, only 44 percent of the residents in fishing villages had knowledge of the effectiveness of condoms in preventing HIV - transmission (Grellier, Tanzarn, Lamberts, & Howard, 2004; MoH-Uganda, 2009). It has been reported that between 5 to 20 percent of residents in the Lake Victoria fishing villages are mobile because they follow fishing trends (Grellier, Tanzarn, Lamberts, & Howard, 2004). Furthermore, fishermen typically spend their nights fishing in Lake Victoria and days in the village. During the day, they commonly drink alcohol and have sex with CSWs and female alcohol sellers who work at bars (Grellier, Tanzarn, Lamberts, & Howard, 2004; Gysels, Pool, & Nnalusiba, 2002).

The combination of environmental and social factors, like poverty, promotes HIV risk. Poverty in Uganda is not linear but cyclical in nature depending on a number of variables like age, sex, and location (UNAIDS, 2012). More than 91 percent of

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chronically poor residents live in rural areas inclusive of fishing communities (UNAIDS, 2012). Unemployment is also high and continues to increase (Uganda Bureau of Statistics, 2010). The 2009-2010 Uganda National Household Survey revealed that the unemployment rate was at 4.2 percent in 2009 - 2010 compared to 1.9 percent in 2005 - 2006 (Uganda Bureau of Statistics, 2010).

Ecology is broadly defined as the interaction between the organism and the environment (Stokols, 1992). However, social ecology looks less at this biological definition of ecology and focuses more on the social, institutional, and cultural contexts of relationships (Stokols, 1992). The social ecological model categorizes individual and environment interactions into different levels to better understand the types of social influence. These levels are intrapersonal, interpersonal, community, and policy (Stokols, 1995). Intrapersonal factors include individual factors such as gender, age, education, condom use, knowledge, beliefs, and attitudes (Stokols, 1995). Interpersonal factors focus on interpersonal relationships including network dynamics, power dynamics within a relationship, and friends and family. Community and environmental factors include cultural norms, social norms, residential segregation, and physical environment. Last in the social ecological model are policy factors which include interpreting and implementing existing policies, at the federal, state, and local governments, that promote or create obstacles to healthy behavior or environmental/social change (Stokols, 1995).

As outlined in the social ecological model proposed by Stokols (1992), “healthfulness is a multifaceted phenomenon encompassing physical health, emotional well-being, and social cohesion” (p.7). The model proposes that health is influenced by many factors beyond the individual level emphasizing that there are different external

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factors that affect health outcomes but that the dynamics of these factors jointly affect the health of community members. Therefore, it is most effective to influence health by coordinating across social ecological levels to achieve the desired behavior change (Stokols, 1995). The model further explains that the interactions between people and their environment influence each other. The environment influences the health of its occupants and occupants actions influence the community (Stokols, 1992). The model also uses systems theory concepts, such as interdependence (dependence on one another), homeostasis (a regulating system of mechanisms that act simultaneously or successively to maintain an environment), negative feedback (a self-regulating system that reduces and stabilizes fluctuations), and deviation amplification (a system has mutual positive feedbacks between the elements in it), to understand the reciprocal interactions of people and their environment (Canon, 1932; Stokols, 1992; Emery & Trist, 1972; Katz & Kahn, 1966; Maruyama, 1963). If a community experiences interdependence, homeostasis maintains the interdependence, negative feedback regulates and limits fluctuations in the environment and deviation amplification creates the mutual positive feedback in the environment to continue to magnify the interconnected and reciprocal relationships of the environment/ecology (Canon, 1932; Emery & Trist, 1972; Katz & Kahn, 1966; Maruyama, 1963).

In the present study we use the social ecological model to better understand the connection between environmental and social factors, and HIV risk (Stokols, 1995). In fishing villages the social ecological model (Figure 2) proposes that there are factors at multiple levels that contribute to HIV risk in fishing villages. To understand the factors associated with HIV risk in fishing communities and develop an effective HIV - prevention program that is accepted by the community it is important to recognize the

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interwoven relationships between the individual, community, and environment. In Auerbach, Wypijewska, & Brodie's (1994) study found the following:

Despite their conceptual contributions, current theoretical models are limited in their ability to predict risk behavior for two main reasons. First, with respect to sexual behavior, the models are based on the assumption that sexual encounters are regulated by self-formulated plans of action, and that individuals are acting in an intentional and volitional manner when engaging in sexual activity. Second, the dominant theoretical models of behavior do not easily accommodate contextual, personal and socio-cultural variables such as gender and racial/ethnic culture. (p.87)

The social ecological model addresses the factors proposed by Auerbach, Wypijewska, & Brodie (1994) and it appears to be one of the first models contributing to the increase in HIV social structural and environmental interventions (Des Jarlais, 2000; Parker, Easton, & Klein, 2000; Sumartojo, 2000). Historically, HIV interventions have focused on the individual level using models such as the trans-theoretical and the health belief model (Center for Disease Control and Prevention [CDC], 2012; Prochaska & DiClemente, 1982; Rosenstock, Strecher, & Becker, 1988).

Public health policy in Uganda is highly supportive of reducing the HIV epidemic. Proactive policies have been established to improve surveillance and to increase access to HIV education, condoms, and antiretroviral therapy (World Health Organization [WHO], 2011). HIV education is now integrated in primary and secondary schools, and is included in workplace safety regulations (WHO, 2011). Furthermore, Uganda has developed the National Prevention Strategy (NPS) for HIV/AIDS in conjunction with the Uganda AIDS Commission (UAC); a positive sign of collaboration and forward thinking (UAC, 2007). The NPS for HIV/AIDS 2011 - 2015 goals are: to reduce HIV incidence by 30 percent by 2015, improve the quality of

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life of people living with HIV by reducing the health effects of HIV/AIDS by 2015, improve the level of access to services for people living with HIV, orphaned and vulnerable children and other vulnerable populations by 2015, and build an effective and efficient system that ensures quality, equitable, and timely service delivery by 2015 (UNAIDS, 2012). Priorities identified in the NPS are: practice and support evidence-based HIV interventions, address socio-cultural and economic drivers of the epidemic, and provide treatment to all eligible individuals (UNAIDS, 2012).

Even though Uganda has supportive policies and strategic plans it has been highly criticized for the Anti-Homosexuality Bill proposed in 2009 and the HIV and AIDS Prevention and Control Bill proposed in 2010 (Amnesty International, 2009; Uganda Congress Bill No. 4, 2011). Though the Bill has not yet passed, it affects the anecdotally reported males who have sex with males (MSM) present in the fishing communities. The Anti-Homosexuality Bill proposes to protect the traditional family by prohibiting any sexual relations between same sex individuals (Uganda Congress Bill No. 19, 2009). The bill further prohibits any international non-governmental agency to provide services to individuals engaging in the behavior prohibited by the bill. As a result, HIV - positive individuals who engage in same sex sexual behavior are at risk of losing HIV treatment and support. Furthermore, those who are not HIV - positive but engage in same sex sexual activity would be at greater risk of contracting HIV due to lack of education and outreach to this community. Fishing communities are already isolated, lack proper HIV testing and education, and could potentially be even more affected by this bill. The little, if any, same sex sexual education that reached these communities is at risk of being abolished. However, due to social stigma MSM do not openly express their sexuality.

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The HIV and AIDS Prevention and Control Bill was proposed as a means to legally establish the rights of HIV positive individuals and create government obligations to prevent new HIV cases in an attempt to control the HIV epidemic (Uganda Congress Bill No. 4, 2011). The bill makes testing mandatory for pregnant women and their partners along with allowing medical practitioners to disclose a patient's HIV status to others, breaching confidentiality standards. Furthermore, the bill criminalizes behavior that might result in transmission among those who know they are HIV - positive (Uganda Congress Bill No. 4, 2011). Though the 2009 draft of the bill has been modified and no longer includes criminalization of mother-to-child transmission, the bill still potentially endangers those who are HIV positive by exposing them to stigma, discrimination, and physical violence.

Overall, even though Uganda has been seen as an HIV success story, changing trends have highlighted populations that have higher HIV prevalence than the national average. The populations that are present in the fishing villages of Lake Victoria including fishermen, fishmongers, alcohol sellers, CSWs, and restaurant owners, are at high risk of contracting HIV. The present study aims to explore the intrapersonal, interpersonal, community, and policy factors associated with HIV risk and the interactions between them in fishing communities in the Wakiso District of Uganda.

### RESEARCH DESIGN AND METHODS

This study is the initial phase of a larger project conducted by Dr. Susan Kiene at the University of Connecticut examining alcohol and HIV-risk among fishermen and commercial sex workers in Uganda. The aim of the study is to: 1) understand the dynamics and social situations that facilitate alcohol and sexual risk behavior among the highest-risk populations (fishermen, fishmongers, alcohol-sellers, and CSWs) in fishing villages on Lake Victoria in the Wakiso District of Uganda; 2) gain experience tracking and retaining participants who migrate to different fishing areas around Lake Victoria with the unpredictable changes in fishing catches and seasons; and 3) use the findings from the research to develop a contextually-informed intervention to reduce sexual and alcohol risk behaviors of the target populations.

#### *Setting*

The study setting was Gerenge, Uganda, in one of the fishing villages in the Wakiso District approximately 30 minutes by car from Entebbe, the nearest mid-size town. Gerenge residents rely on public minibuses and motorbikes to traverse the dirt road from the village to reach the main (paved) road which leads to Entebbe and Kampala. Gerenge was chosen as the site because it is a fishing community with a large population, about 1000 residents, which allowed for recruitment of sufficient participants. It is also a fishing village that is known to have a mobile CSW population and transient fishermen. The fishermen in Gerenge spend most of their nights on Lake Victoria fishing. They arrive in the morning to Gerenge and sell their fish. Most fish are sold to "middlemen" who take it and sell it to those who sell it at fish markets in Kampala and other towns. Some of the fish are sold to fishmongers in Gerenge to be consumed within the village.

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Life in the village centers around the fishing industry. There are bars, restaurants, and small shops that cater to the fishermen and other village residents which mostly include those who work at these establishments as well as commercial sex workers. The type of housing and buildings in Gerenge are non-permanent. Most homes were built using wood and aluminum sheets with only a few homes built from clay. Sanitation, electricity, and running water are poor and a high population density adds to the lack of good public health. Essentially the villages are like the slums that one might see in a city.

The fishermen rent places to sleep during the day after they have engaged in their daily activities and some sleep in their wooden boats on shore. The fishermen stay in villages like Gerenge for periods of weeks or a few months at a time until the fishing trends deteriorate and they must go to another part of the lake where they can catch more fish. The most common fish in the lake are tilapia and Nile perch.

### *Procedures*

The research team worked in collaboration with Wakiso Integrated Rural Development Association (WIRDA), a local community organization. Working with WIRDA as a community partner, that directly worked with the target populations and had existing relationships with the community leaders, assured the desired sample size by assisting with recruitment, and building trust with the community. The research team included the primary investigator (Dr. Kiene), WIRDA Chairman (Michael Kintu), an experienced focus group facilitator, two transcribers who also served as translators, a research assistant, and a community organizer. WIRDA and the community organizer worked with the local Beach Management Units (BMU) to identify fishermen, fishmongers, and alcohol sellers for participation in the study. The



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BMU are community leaders of the fishing village with each of the five focal populations having their own leader. The focal populations of the study: fishermen, fishmongers, alcohol sellers, CSWs, and restaurant owners, were chosen because they compose the majority of the overall fishing community population. A half day sensitization seminar conducted by the research staff provided BMU information about confidentiality and cultural sensitivity in the identification process. To recruit CSWs for participation, in collaboration with the BMU, social gatherings were sponsored inviting known members of this population in order to build trust and inform them about the study. Additionally, BMUs relied on word of mouth referrals within the CSW community to recruit individuals to participate in the study.

### *Methods*

The study used primarily qualitative methods utilizing focus group methodology. Quantitative demographic information was collected from participants in each focus group. The demographic data collected were: gender, age, tribe, religion, education level, marital status, how many husbands/wives, and the village of residence. Both qualitative and quantitative (demographic) data were collected during 90 minute focus groups. Seven of the eight 90 minute focus groups were recorded. One of the focus groups was not recorded due to technical difficulties; however, detailed notes of the discussion were documented. The recordings were transcribed into Luganda and then translated to English.

Focus groups were conducted until we reached saturation in responses (i.e., we were hearing the same responses in the groups). A total of 50 individuals participated in the study with a total of eight focus groups conducted. One fisherman's demographic information was not recorded and therefore his information is not included in the

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demographic data in Table 1. However, his participation in the focus group was recorded and included in the data analysis. Two focus groups were composed of fishermen (n=13), two groups of fishmongers (n=13), two groups of alcohol sellers (n=12), one group of CSWs (n=6), and one group composed of restaurant owners (n=6). In the CSWs group, all known CSWs in the fishing village were surveyed.

Focus group methodology was chosen to collect data since this method has proven to be successful in exploring and examining what participants think (Flores & Alonso, 1995). Furthermore, it allows participants to explore their own needs and concerns while remaining within a social group similar to the one in which they already belong (Flores & Alonso, 1995; Kitzinger, 1994). Focus groups allow researchers to better understand group dynamic versus a one-to-one interview session. An important characteristic of focus groups is that it allows firsthand observation into the respondents' behaviors, attitudes, and language (Flores & Alonso, 1995). Based on previous research the best size of the focus group is six to eight (Kitzinger, 1994). Having more than eight individuals can result in group dynamic issues and make it difficult to engage all participants in the same extent (Kitzinger, 1994).

The focus group facilitator had competencies in areas of pauses and probes (by saying phrases like: "Would you explain further?," "Would you give an example?," and "I don't understand"), & control of verbal and nonverbal reactions to participants (participating in head nodding and avoiding expressions such as "that's good" or "excellent"). Additionally, the facilitator encouraged shy participants while controlling dominant talkers.

Participants were 18 years or older whose primary language was Luganda. The protocol called for exclusion of individuals who could not speak or understand

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Luganda, who were under 18 years of age, or who were intoxicated at the time of the interview. However, we did not encounter any of those issues and no participants were excluded.

Participants had the study explained to them by the Luganda-speaking focus group facilitator who obtained informed consent from those who participated. Due to the overall minimal risk of the study, a waiver of written consent was received from the Institutional Review Board (IRB). IRBs in the U.S. and Uganda, and the Uganda Council for Science and Technology reviewed and approved the study. A modified version of the focus group protocol was used that had been successfully employed in qualitative research on the dynamics of sexual risk behavior with HIV-positive patients in South Africa and with outpatients in rural Uganda (Kiene et al., 2005; Kiene, Fisher, Cornman, Friedland, & Moll, 2004). Focus group participants were served refreshments during the focus group discussions.

The focus groups occurred within one month of the first focus group being conducted. Also, all focus group data was translated within a month of being transcribed into Luganda by the two transcribers. The time-frame of one month for commencement of data analysis fostered a research team that had fresh memories of subjects and observations. Observational notes were taken by the research assistant about participant behavior during the focus groups, fishing village conditions, and overall common roles in the community.

The data was analyzed using content analysis. Content analysis is a method that examines information in a dataset that is primarily quantitative (Smith, 2000). At first the data was analyzed by an individual focus group. The questions and responses of each of the groups, CSWs, fishermen, fishmongers, alcohol sellers, and restaurant

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owners, were entered into a Microsoft 2007 Excel file by the research assistant for analysis. Within each Excel file every question and response had a separate Excel sheet. For example, in the Excel file for fishermen focus group one, an Excel sheet was created for the question: “How and when did you start engaging in this kind of work?” In that Excel sheet all the fishermen’s responses in that focus group, for that question, were recorded. The participant’s responses were then coded by the research assistant based on how the response reflected an aspect of the social ecological model. Responses were coded with “I” (interpersonal), “T” (intrapersonal), “C” (community), or “P” (policy). Answers were coded with multiple letters based on the social ecological model. Once each individual focus group data was coded, social ecological factors were compared across all focus groups for similarities and differences.

### RESULTS

Participant demographic data are reported in Table 1. There were 23 males and 27 females in the study. Men had an average age of 28.9 with a range of 20 - 47 and women had an average age of 31.7 with a range of 22 - 52. A total of 73 percent of men were married compared to 41 percent of women. The most predominant religion was Catholicism and most participants had some primary education.

Due to the fact that fishermen and CSWs are the main populations most actively engaging in risky behavior, I will report primarily on their focus groups conversations. There were a total of 13 fishermen in the two focus groups, all of whom were males. Most fishermen reported their jobs were not easy but that it was a job in which they did not need previous experience. Ten of the 13 men said they became fishermen due to financial troubles, and three said they do it because it was the easiest job to find. Fishermen identified both benefits and challenges of their occupation. Benefits included: good income when fishing season was good, enough money to support family, and to buy cows and goats. However, more challenges than benefits were identified in both fishermen focus groups. Challenges identified included: fluctuating sale price of the fish, windy periods that hurt their fishing season and damaged their boats, and unstable income. Another challenge mentioned by most fishermen was not having enough income to buy proper fishing gear. Since they do not have the funds to buy the proper fishing gear they purchase the “prohibited” fishing gear which catches fish that are not compliant with the minimum fish size limit. Therefore, the police confiscate their fishing gear and the fishermen once again find themselves in financial hardship.

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A fisherman, age 38, reported: “99% [of people] understand [HIV], what it brings; they know that it is acquired through unprotected sex.” It was also stated by the same fisherman that fishermen fear the lake more than they fear HIV because they can live with HIV for many years versus dying in the lake. Another fisherman, age 36, reported:

“The landing site is a small place with high population, after fishing, and one have earned money, he goes to a bar, drinks, after which he goes for women who are always available in bars, lodges, and restaurants and bargaining for sex.”

The fishermen reported that they consume little to no alcohol on a daily basis but that other fishermen do consume alcohol, that overall most people in the village drink alcohol, and that alcohol consumption is a problem in Gerenge.

Additionally, fishermen also reported that overall, fishermen in the community often engage in sex with CSWs. One fisherman, age 28, stated “to most people it’s by nature, some of them are married.” Another fisherman, age 20, added:

“most people engage in commercial sex; one may come from the lake tired, another may come with a desire to drink alcohol, if you don’t take alcohol, you don’t go to clubs, don’t know how [but] one starts leaving his wife at home and goes for commercial sex in the lodge.”

Also responding to fishermen engaging in sex with CSWs, another fisherman, age 36, stated, “I just came and such behaviors are not in my home village, I got them here.” Another fisherman, age 24, added “if a fisherman doesn’t drink alcohol, he doesn’t indulge in commercial sex. It’s those who drink that engage in commercial sex.” There was only one fisherman, age 25, who stated “not all [fishermen] go with CSWs.”

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The CSWs focus group was composed of six women. All six women stated they began their occupation due to financial hardship. The group also identified the benefits and challenges of their occupation. Benefits included: being able to pay for school fees, visit family in their hometowns, build a home, and buy nice things for themselves. Similar to what the fishermen reported, there were more challenges identified than benefits. Challenges included: clients take too long to orgasm; clients mistreat them, are dirty and smell bad; clients demand refunds; and lastly CSWs reported not wanting to have sex without love but are forced to because of their financial situation.

CSWs identified mistreatment and physical abuse occurs often as part of their occupation but they have developed ways to help each other. A CSW, age 29, reported:

“Some men don’t accept and yet you have refunded his money, we all assist each other, he becomes more stubborn if you have not refunded his money, the moment one shouts three times, we just know that the man has refused to get out, there is a problem, we chase him with sticks, lifting him up.”

This quote illustrates how the women given their circumstances still feel empowered.

Furthermore, CSWs identified their clients mainly as married men and also said that on their free time they do not socialize with married women because the married women become suspicious of them. CSWs rather socialize with other CSWs to discuss client trends and see which village they need to go to next if they don’t have clients.

CSWs and fishermen reported similarities and differences in their lifestyle. Both populations agreed that fishing season affects their jobs; when fishermen cannot fish they don’t have cash and as a result the CSWs don’t have clients. Furthermore, both populations agreed that the environment they live in has a negative effect on them. Similar to the fisherman, age 36, who reported “I just came and such behaviors are not

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in my home village, I got them here,” a CSW stated “I am a Muslim but the situation makes us learn to drink some alcohol.” These quotes illustrate the pattern in the data of how environment influences behavior.

Differences in the reporting between CSWs and fishermen included perception of alcohol consumption. Most of the fishermen in the focus group stated they personally do not drink alcohol but did report that CSWs and most fishermen consume alcohol. However, the CSWs in the focus group said that all CSWs do drink alcohol and they all personally reported they consume alcohol. Additionally, another large difference between what the fishermen reported compared to what the CSWs reported is abuse. None of the occupational challenges identified by the CSWs were mentioned by the fishermen as behavior they engage in (e.g., mistreating women, poor hygiene, etc).

The focus group data illustrated the complex social ecological factors associated with increased HIV risk in the fishing villages. Poverty and unemployment, which are a policy/society level factor of the social ecological model, were the largest driving force that led participants to their occupation and in turn increased HIV risk. Poverty forced individuals into occupations they may not have otherwise chosen. Participants reported difficulties paying their own school fees, their children’s school fees, purchasing food, and paying rent. One CSW, age 30, reported:

“The reason why I started this job [was because] my husband was murdered and after his death, I tried many jobs and didn’t get anything. It is now two years and my husband left me with four children. I needed to pay school fees.”

Another participant, alcohol seller, age 32, explained “It was not my wish to start this business.” A fisherman, age 28, stated “I came in 2005, from Rakai due to the situation at home, my parents were financially incapacitated.” These two statements illustrate a



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pattern in the data that poverty and unemployment bring individuals to the fishing villages because they know there are jobs in fishing, selling alcohol, and CSW. The land is not as good to farm on as in other rural areas and therefore people resort to the predominant jobs in the community; alcohol seller, restaurant owner, fishermen, fishmongers, or CSWs.

A second factor that leads to participant occupations is pressure from family and friends. In the CSW groups, three of the six women were encouraged to seek this job as a means of survival from a friend. Five fishmongers, five fishermen, two restaurant owners, and one alcohol seller were referred by family or friends to their current occupational job. Two fishermen described they were forced into their job. One of those two fishermen was brought to the village by a family friend under false pretenses and forced to fish. The other fisherman was forced by his older brother to fish. Poverty and lack of opportunities elsewhere brings them to the fishing village, which in turn exposes them to more environmental and interpersonal factors that place them at risk for HIV. The individuals referred to the occupation may be pressured to remain in that trade as a sense of loyalty to the person who referred them. Also, those who were forced into their occupation may turn to alcohol and engage in sex with CSWs as an outlet, or as a means to rebel, which in turn also increases the risk for HIV.

Poverty and unemployment, along with pressure from family and friends, bring individuals to the fishing village and their current occupation. Once employed in their position, all focus group participants reported earning cash. There were only two reports of receiving fish or charcoal for services provided by a CSW. Cash allows for a quick and fluid exchange of services, whether it is purchasing alcohol or purchasing the services of a CSW, because there are no banks involved or checks to write in these

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transactions. Focus group participants explained that having a place to store daily cash sales would decrease their alcohol consumption and lessen their opportunities to have sex with CSWs. A fisherman, age 31, stated “One can have two or three women a day, depending on his pocket (cash).” Another fisherman, age 24, reported “If we [fishermen] have cash in the pocket, we spend it all.” These comments bring light to the reciprocal influence of occupation, cash, and community environment that lead to HIV risk; poverty brings people to the village and to their current occupation, they earn cash and then they spend it on what the community has prescribed as acceptable and their participation in these activities further reinforces the community behavior.

The relationship between occupation, cash, and community are tightly interwoven. At the community level fishing villages are lacking resources to create change and decrease HIV rates. Most participants reported lack of time and/or exposure to get involved in community activities. With existing cash flow and limited alternative activities to engage in, community members turn to the two most common activities in the village: alcohol consumption and risky behavior with CSWs. Besides the lack of alternative activities for the community there is also lack of HIV prevention services. Participants expressed they want to have seminars by trained professionals educating people about HIV at the fishing villages. Three fishermen suggested constructing a hospital. Furthermore, the community does not have banks. Participants explained that having a place to store daily cash sales would decrease their alcohol consumption and lessen their opportunities to have sex with CSWs. As a result of not having many community activities or positive reinforcements many individuals within the five populations studied turn to alcohol and sex, and have an increased risk of contracting HIV.

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Geographic location was a large environmental level factor associated with HIV risk in the fishing community. Participants in all five studied populations stated their community was isolated and lacked the resources to prevent new HIV infections. All focus groups stated they wanted to have more educational programs, access to HIV testing, and overall better healthcare. Lack of education and resources is a large contributor to increased risk of HIV.

How individuals, who are affected by their community, become at risk for contracting HIV becomes clear when we unfold the complexity of the interactions among multiple social ecological levels. As previously stated, poverty drives the individual to the village and to their occupation which is further influenced by family and friends. The cash flow, lack of alternative activities and banks, along with isolation further reinforce the risky behaviors of the community members. However, it's the reciprocal influence of the individual and community that propagate HIV risk. The community is affecting the individual, by dictating behavior, and the individual is also affecting the community, by continuing the behavior.

The community's isolation and lack of prevention services along with lack of formal education further adds to the reciprocal influence of the individual and the community. Significant misinformation exists in the village and again further propagates risky behavior and HIV risk. Since policy in Uganda dictates that HIV education is part of school curricula, those who did not attend school and are now in the fishing villages are at even greater risk of HIV. They not only lack the education from the school system, but their current environment is not helping them learn the necessary HIV information. As a result, the individual continues to engage in risky behavior because the environment has prescribed a certain type of lifestyle. In turn, the

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community is further affected because the individuals continue to reinforce the lifestyle.

Some of the common misinformation based on low level of health knowledge in the village includes: the belief that a condom can get caught in the cervix for months and cause cervical cancer, that using two male condoms simultaneously is safer than one condom, and that beautiful healthy women are not HIV positive. One fishmonger, age 29, reported:

Before using condoms with any woman, I first study a woman, I cannot use a condom on a young girl of 17 years, she is still a cream, without having slept with many men, but [with] old women I use condoms because they have had sex with many men.

Due to the fact that there is not a health educator or a health facility in the community false information/beliefs will not be corrected and increased HIV risk will continue.

Another intrapersonal factor that influences the community is risk perception. Fishermen reported they engage in risky sexual behavior with CSWs and alcohol sellers once they return from fishing as a reward to themselves for surviving another day on the lake. One female alcohol seller, age 29, reported “Fishermen only fear when they are about to die, they don’t fear sick women.” Their risk perception is low and therefore they engage in risky behavior. One fisherman, age 39, reported:

Eighty percent of fishermen take alcohol since they are aware that AIDS doesn’t kill instantly. The risks of dying from AIDS are fewer than drowning. Women outnumber men on the landing site and they think that beautiful healthy women don’t have AIDS. Fat women are not infected with AIDS, thinking slim women are the ones infected. Some [CSWs] do

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come after having lost their dear ones, therefore when they come to these places they don't care about HIV/AIDS.

This quote illustrates a pattern in the data that supports the multi-level interactions that lead to HIV risk in the community. The fishermen acknowledge that CSWs come to the fishing village due to having lost a loved one, presumably from HIV and possibly the person who financially supported them. Other CSWs also explained similar situations in their focus group. Again poverty and unemployment are the principal driving forces that result in the CSW's current occupation. The community environment and financial circumstances further makes them "not care about HIV/AIDS." Additionally, the risk perception of the fishermen leads men to engage in risky behavior with the CSWs. They believe the lake is more dangerous and more likely to kill them than AIDS. Furthermore, there is a low risk perception of a circumcised man contracting HIV from unprotected sex. An alcohol seller, age 30, reported: "There are men with high libido, and cannot be advised to use condoms but if one is circumcised, he stands a chance of not acquiring HIV and other STDs." This quote illustrates a pattern in the data of engaging in risky behavior due to risk perception.

Consuming alcohol and engaging in sex is perceived as low risk in the community. Alcohol use increases HIV risk in the community. The participants reported engaging in sex with CSWs after they had consumed alcohol and/or after buying the CSW alcohol. A fisherman, age 38, reported "after fishing and earning money, I go to a bar and drink after which I go for women who are always available in bars, lodges, and restaurants." Five CSWs reported they find their clients at bars. Two CSWs reported they engage in drinking alcohol with their clients before engaging in sexual intercourse. One CSW, age 30, reported: "I drink while working, men buy for

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me and I also buy for myself. I drink either four or three bottles of beers. They may buy for me two bottles of beer and I buy myself.” These quotes illustrate that the perceived HIV risk of consuming alcohol and engaging in sex is low even when individuals are sober. One CSW, age 33, further explains:

There are some who drink and are tricked to go without condoms, there are CSWs who come to the landing site, you know men on landing sites prefer live sex (unprotected sex), or he removes the condom for live sex and when you are drunk already, and weak, you don't have power to fight him as he removes the condom, and when others drink alcohol, it puts them in moods of love, they become excited and forget the aim, they become interested in sex.

These comments bring light to the low perceived HIV risk by some members in the community. Some CSWs did acknowledge that they do not drink before they work, but shared what happens to other CSWs, which indicates that there are still CSWs who do drink while at work. Choosing to drink alcohol is an individual behavior, an intrapersonal factor. However, this intrapersonal factor and risk perception beliefs, are influenced by the reciprocal interactions with the community environment since the community supports the negative health behavior.

Condom negotiation, protected sex versus unprotected sex, is another factor that plays a role in the reciprocal influence of the individual and the community environment. One alcohol seller stated, “They give boxes of condoms to all bars and lodges, but when you move around, you find condoms [on the ground] still in the packets.” Another alcohol seller stated “In reality, fishermen don't want to use condoms. Sometimes they use cut condoms. The tip of the condom is cut off and the

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woman will see the condom on, without noticing it is hollow.” Therefore even if a CSW were to have negotiated the usage of the condom if she is not careful she may still be involved in unprotected sex. Condom negotiation also depends on payment amount. The CSWs who engage in live sex or “body to body contact” charge 30,000 shillings (about \$12 USD) and for protected sex or “condom to body contact” they charge 3,000 shillings” (about \$1.20 USD). Lastly, it was stated that men who come to fishing villages to have sex with CSWs all want “live sex,” which makes it challenging for the CSWs. Depending on factors such as financial need and alcohol consumption, the CSW and fishermen may or may not end up using a condom.

Another interpersonal factor influencing the community and individual relationship is the financial responsibility workers have when they are at the fishing village. CSWs have the financial responsibility to pay for their lodges, the rooms where CSWs engage in sex with their clients. The lodges are managed by one main individual. This individual in charge of the lodges is referred to by the CSWs as a landlord. When a CSW has not had enough clients to pay the landlord they are more likely to engage in riskier behavior so she can earn enough cash to pay rent. Alcohol sellers and restaurant owners also have financial responsibilities and at times are also faced with economic hardship. One alcohol seller stated she would become a CSW if her sales stopped because she knows CSWs in her community make good profit. Her statement highlights that interpersonal factors and external pressures along with the prescribed risky occupations available in the community further increase HIV risk within the community.

Lastly, an external factor that plays a role in the reciprocal relationship between the individual and the community is the quality of the fishing season. The occupational

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jobs of the community heavily rely on one another and when fishermen don't have enough money to spend, fishmongers, restaurant owners, alcohol sellers, and CSWs are all affected. An alcohol seller, age 28, reported "During a season with good catches and public holidays like Easter and Christmas, they take a lot of alcohol." Another alcohol seller, age 29, further explained "During windy periods, fishermen don't work; don't have money so they don't drink." When fishermen don't have work it greatly affects the remainder of the social interactions. A restaurant owner, age 28, reinstated "you know, the more the fish catches the more money." When the fishermen don't have money, alcohol sellers, restaurant owners, and CSWs are all affected with a decrease of clients. A CSW, age 29, also reported "When we reach the landing sites during full moon we don't get customers, [but] darkness catches are okay and so we get money." When there is cash, as one fishermen, age 26, stated "[we] spend it all."



### DISCUSSION

This study explored the social ecological factors associated with HIV risk in fishing communities in Lake Victoria, Uganda. The results illustrated the interwoven relationships between the intrapersonal, interpersonal, community, and policy levels of the social ecological model at a fishing community that is facilitating risky behavior and increasing HIV risk.

The main driving factor interwoven in several social ecological levels is poverty. Poverty was present at the intrapersonal, interpersonal, and community level in the fishing village. Financial need was identified as being the driving factor to choose the individual's occupational job. Participants either could not afford to pay school fees, for themselves or their children, or did not have enough money to feed themselves and/or their children. As a result of financial hardship participants chose to begin their specific occupation to make a living.

Along with poverty, participant gender played a role in the occupation they chose which was set by the community standards of gender roles. Women were more likely to be a CSW, alcohol seller, or restaurant owner, and men were more likely to be fishermen or fishmongers. Also, women were likely to engage in CSW when faced with financial hardship, even though their main occupation was something else, and the men in the community when faced with financial hardship would return to their home village to find another temporary occupation. Therefore, it is evident that poverty created a unique interrelationship across several levels resulting in an increased risk for HIV in the community. It would take more than working with a specific individual and increasing their living standards to reduce their HIV risk; an intervention would have to be introduced at multiple levels. Even if one individual's HIV risk was decreased, the

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prescribed social norms of the community would make it difficult, and potentially impossible, for the new positive health behavior to continue due to the tightly woven roles, social norms, and interactions of the community.

As outlined in Figure 1, the relationship between the individual and the community is reciprocal and its effects are seen across various levels of the social ecological model. Lack of HIV education highlights one multi-level factor that leads to increased HIV risk: present at the intrapersonal, interpersonal, and community level. The fishing village did not have access to proper sexual health education nor HIV testing facilities. CSWs stated they taught themselves safe sex practices, like using two male condoms. Also fishermen reported that men who are circumcised can engage in unprotected sex with CSWs because they are less likely to contract HIV. Both previous statements, which are based on misinformation, can be avoided with proper sexual health education. However, the community does not provide resources to properly educate about safe sex practices so the occupants engage in risky behavior and normalize their behavior for the community. Two common factors identified by focus group participants were lack of peer health educators or a clinic to seek information and HIV prevention counseling. Participants acknowledged that the lack of resources available lead to the continued unsafe sex practices occurring in the community. The common misconception that leads to fishermen engaging in unprotected sex is their belief they can live with HIV for many years but may die in the lake that day. This belief needs to be addressed by providing proper HIV prevention programs to educate, motivate, and provide necessary HIV prevention skills. These are interactions at the intrapersonal level since for many it is personal belief, interpersonal level, since the belief dictates the behavior in relationships, and community level, since the belief and

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the interactions are widely dictating the overall HIV risk of the fishing village. Misinformation, and not having the correct resources to correct the information, propagates risky behavior and HIV risk for individuals and for the community as a whole.

Furthermore, as reported by the participants in the study, the community does not provide many alternative activities. Since there are no educational or recreational clubs, during their free time community members engage in risky behaviors. Societal beliefs, norms, and standards have been shaped around the existing deficit of positive community structure and have been negatively affecting the fishing village. The community as a whole reported isolation and has created its own beliefs and values around those feelings. Establishing permanent connections with health clinics for monthly health education and healthcare visits can be used as a means to begin to redefine their beliefs and values. A community level intervention that works towards changing the intrapersonal beliefs and the negative interpersonal interactions has the potential to greatly reduce HIV risk in the community.

A potentially positive community-individual factor identified to reduce HIV risk is the empowered CSWs. It was discussed during the focus groups that CSWs are not organized by an individual who collects the earnings the CSWs make. There is a person, referred by the CSWs as a landlord, who overlooks the lodges and collects the rent but earnings are kept by the CSWs. This is unique to the fishing villages and has the potential to be beneficial in reducing HIV risk because the women are self-employed and already have a tightly-knit community. Introducing a multi-level social ecological intervention that further empowers them would be beneficial to the community as a whole.

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Even though policy supporting HIV prevention activities exists in Uganda and the government recognizes that CSWs and fishermen do not benefit from traditional HIV programs, there is still a lack of HIV policy being implemented in fishing villages. Recognizing the lack of medical and educational outreach to fishing villages is a good first step for the government, but now action is needed. As previously identified fishing communities have a very distinct system for functioning; the communities largely rely on the fishermen. Taking these findings into account, more policy that supports HIV prevention activities specific to fishing villages has the potential to reduce HIV risk. Furthermore, another policy level factor that can be harming the fishing communities and increasing HIV risk is the Anti-Homosexuality Act. This act creates greater stigma towards the anecdotally reported MSM who live in the fishing villages. The fear and stigma is likely to be the reason why the topic did not come up during focus groups. The lack of policy to support a decrease in HIV risk further reinforces the need for a multi-level intervention that includes intrapersonal, interpersonal, community, and policy levels.

Understanding how multiple social ecological levels of influence interact to promote risky sexual behavior is crucial to help develop more effective HIV prevention interventions in fishing villages. Also, since culture and societal expectations play an important role shaping behavior these should be explored and addressed when developing interventions targeting individuals at high risk for contracting HIV. Fishing villages would benefit from a multi-level approach to HIV prevention that addresses both individual and environmental determinants of risky behavior including poverty and alcohol use. Future research should analyze differences in condom use between CSWs at bars versus CSWs in the lodges or streets. In addition, it would be helpful in

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developing multi-level interventions to understand if there is a difference in condom use between CSWs at bars versus CSWs in the lodges or streets. Furthermore, due to the interwoven relationships in the fishing villages new social norms need to be introduced that will create a positive behavior change. Changing the behavior of one individual in this community, while possible, would be difficult to maintain due to the prescribed norms of the fishing village. A larger multi-level intervention that creates a change at the intrapersonal, interpersonal, community, and policy level would prove more successful.

The findings of this study are similar to those of a previous study done in the Ugandan fishing villages (Alex, Michael, & Nordin, 2011; Grellier, Tanzarn, Lamberts, & Howard, 2004). Both the study conducted by Alex, Michael, & Nordin (2011) and this study showed that participants had a moderate knowledge of HIV risk and prevention. Furthermore, participants' knowledge of condom dispensary was high in the present study, as well as in the study conducted by Alex, Michael, & Nordin in 2011. CSWs in both this study and in Alex, Michael, & Nordin (2011) were found to have a high HIV risk because they reported engaging in unprotected sex with their clients. A difference in findings between Alex, Michael, & Nordin (2011) and the present study is that their study did not report that men who are circumcised believe they can engage in unprotected sex because they are less likely to contract HIV as reported in our focus groups. Grellier, Tanzarn, Lamberts, & Howard (2004) and the present study are similar in that they both report on mobile populations, effects of remote location, and high HIV risk of populations in the fishing villages. However, neither the study conducted by Grellier, Tanzarn, Lamberts, & Howard (2004) nor the study conducted by Alex, Michael, & Nordin (2011) report findings through the social

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ecological model which is helpful in understanding how one might create interventions to address the most important factors that affect HIV risk.

Previous studies striving to reduce HIV risk have highlighted the importance of using an ecological framework to accomplish their goal (Sallis & Owen, 1997; Cohen, Scribner, & Farley, 2000). Both Sallis and Cohen's studies acknowledge the importance of individual factors; however they are explored within the whole environment of a community. Cohen, Scribner, & Farley (2000) state, "Altering policies, practices, and the conditions of life can directly and indirectly influence individual behavior" (p. 146). Different categories such as: availability of protective or harmful consumer products, physical structures, and media and cultural messages were examined (Cohen, Scribner, & Farley, 2000). These factors were found to "directly influence individuals through facilitating or constraining behavior and changing individual-level attitudes, beliefs, and cognitions, as well as group norms" (Cohen, Scribner, & Farley, 2000, p. 146). The social ecological model has been used to guide interventions for a variety of health behavior change interventions including stress reduction and exercise. It is noted that this specific model was utilized for varying outcomes due to the fact that it addresses the multi-level factors that support and maintain unhealthy behaviors in communities (Cohen, Scribner, & Farley, 2000; McLeroy, Bibeau, Steckler, & Glanz, 1988; Sallis & Owen, 1997). Similarly, our study used the social ecological framework due to its multi-level approach to behavior change.

The increase of HIV prevalence rates in fishing communities in the Wakiso District of Uganda is alarming. A country known for its success in reducing overall HIV rates in the 90s, Uganda should now focus on high-risk communities, such as

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fishing communities, in which HIV rates have substantially increased. This study allows for the examination of possible contributors to the increase of HIV prevalence.

The present study has a number of limitations. The self-reported nature of the data and the fact that only one fishing community was surveyed in the study limits the generalizability of the data. Also, the qualitative nature of the data does not provide information about the actual levels of individual risk in the community nor how representative the opinions of the participants are to those of the whole community.

The data illuminated the lifestyle, livelihood, and structural factors such as geographic isolation, daily cash incomes, few alternative income generating opportunities, high risk occupations, poor access to health care and other services, high levels of mobility, and absence of traditional social support structures, which all likely contribute to risky sexual behavior (Grellier, Tanzarn, Lamberts, & Howard, 2004; Gysels, Pool, & Nnalusiba, 2002). Understanding these social ecological factors will allow for policy changes and targeted interventions to achieve a decrease in new HIV infections in fishing communities. Furthermore, prevention programs can be developed that address the specific HIV risk factors indicated by the data such as lack of sexual health skills, negative social norms, and negative attitudes. HIV policy specifically addressing the needs of fishing communities would be a positive addition to reduce HIV risk in these populations and communities. As this study illustrates, the social ecology of HIV risk in fishing communities in Uganda is complex and multi-level interventions are needed to address these complexities in order to decrease HIV risk in these communities.

## TABLES

Table 1. Participant Demographic Data

	<b>Men (n=23)</b>	<b>Women (n=27)</b>
<b>Age</b>	28.9 (20-47)	31.7 (22-52)
<b>Marital Status</b>		
Single	27 %	59 %
Married	73 %	41 %
<b>Religion</b>		
Catholic	41%	63 %
Protestant	27 %	15 %
Muslim	9 %	18 %
Other	23 %	4 %
<b>Occupation</b>		
CSW	0	22 %
Fishmonger	40 %	15 %
Fishermen	55%	0
Alcohol Seller	5 %	41%
Restaurant Owner	0	22 %
<b>Education</b>		
No formal Education	9 %	4 %
Some primary	32 %	48 %
Some senior	22 %	37 %
Completed senior	32 %	7 %
Pre-university	5 %	4 %
<b>Tribe</b>		
Ganda	41 %	56 %
Samya	0	11 %
Other	59 %	33 %
<b>Village</b>		
Gerenge	73 %	78 %
Outside Gerenge	27 %	22 %



FIGURES

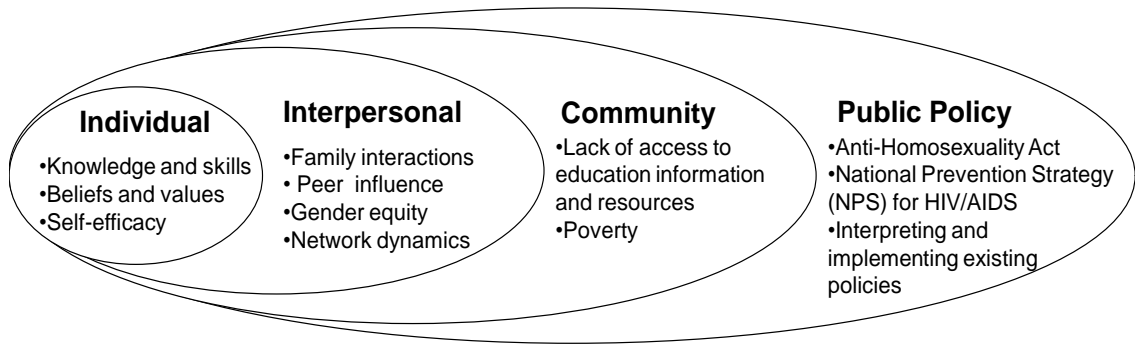


Figure 1. Socio Ecological Model for Fishing Community in Lake Victoria, Uganda

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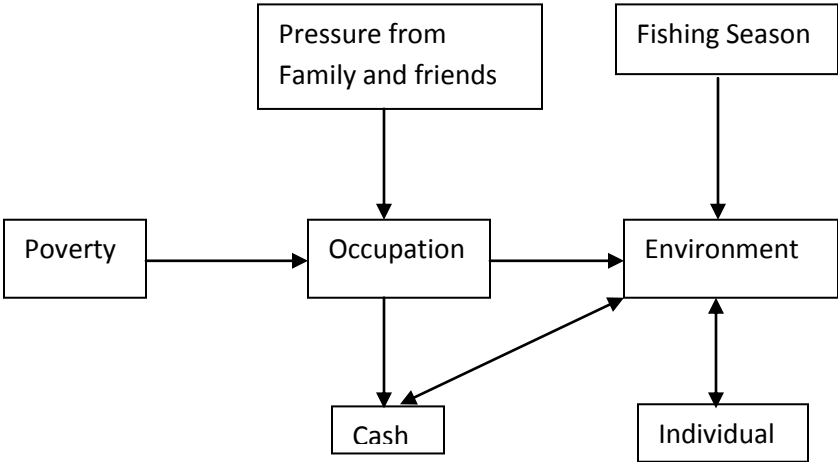


Figure 2. Relationship of influences that lead to HIV risk.

REFERENCES

- Alex , O., Michael, M., & Nordin, M. (2011). *HIV Sero Behavioral survey in fishing communities of the Lake Victoria Basin of Uganda*. A consultancy survey commissioned by the Lake Victoria Basin Commission (LVBC).
- Amnesty International. (2009). Uganda: ‘Anti-Homosexuality’ Bill Threatens Liberties and Human Rights Defenders. Retrieved from <http://www.amnesty.org/en/for-media/press-releases/uganda-%E2%80%98anti-homosexuality%E2%80%99-bill-threatens-liberties-and-human-rights-defenders>.
- Auerbach, J. D., Wypijewska, C., & Brodie, H. (Eds.). (1994). *AIDS and behavior: An integrated approach*. Washington, DC: Institute of Medicine, National Academy Press.
- Cannon, W. B. (1932). *The wisdom of the body*. New York: Norton.
- Center for Disease Control [CDC]. (2012). *Behavioral Interventions for STD/HIV Prevention*. Retrieved from <http://www.cdc.gov/std/training/std101/presentations-2012/Behavioral-interventions.pdf>
- Cohen, D. A, Scribner, R., & Farley. (2000). A structural model of health behavior: A pragmatic approach to explain and influence health behaviors at the population level. *Preventative Medicine, 30*(2), 146-154.
- Des Jarlais, D. C. (2000). Structural interventions to reduce HIV transmission among injecting drug users. *AIDS, 14*: S41–S46.
- Emery, F. E., & Trist, E. L. (1972). *Towards a social ecology: Contextual appreciations of the future in the present*. London: Plenum Press.
- Flores, J. G., & Alonso, C. G. (1995) Using focus groups in educational research, *Evaluation Review 19* (1): 84-101.
- Grellier, R., Tanzarn, N., Lamberts, D., & Howard, C. (2004). *The Impact of HIV/AIDS on Fishing Communities in Uganda--Field Study Report*. Marine Resources Assessment Group and Options Consultancy Services.
- Gysels, M., Pool, R., & Nnalusiba, B. (2002). Women who sell sex in a Ugandan trading town: life histories, survival strategies and risk. *Social Science & Medicine, 54*(2), 179-192.
- Katz, D., & Kahn, R. L. (1966). *The social psychology of organizations*. New York: Wiley.

## A SOCIAL ECOLOGICAL APPROACH

- Kiene, S. M., Fisher, J. D., Christie, S., Cornman, D., Pillay, S., & Cele, M., (2005). *Formative Research for the Development of a Clinic-Based Hiv Risk Reduction Intervention for HIV+ Individuals in Durban, South Africa*. Paper presented at the 7th International AIDS IMPACT Conference: Biopsychosocial Aspects of HIV Infection.
- Kiene, S. M., Fisher, J. D., Cornman, D., Friedland, G., & Moll, A. (2004). *Challenges of and Possibilities for HIV Prevention in the Clinical Care Setting in Kwazulu-Natal, South Africa*. Paper presented at the XV International AIDS Conference, Bangkok, Thailand.
- Kitzinger, J. (1994). The methodology of focus groups: the importance of interaction between research participants. *Sociology of Health* 16 (1): 103-21.
- Maruyama, M. (1963). The second cybernetics: Deviation-amplifying mutual causal processes. *American Scientist*, 51, 164-179
- McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly*, 15, 351-378.
- Ministry of Health [MoH] Uganda. (2009). Magnitude, Profile and HIV/STD Related Knowledge and Practices of Commercial Sex Workers in Kampala, Uganda.
- Parker, R. G., Easton, D., & Klein, C. H. (2000). Structural barriers and facilitators in HIV prevention: A review of international research. *AIDS*, 14: S22–S32.
- Prochaska, J. O., & DiClemente, C. C. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research and Practice*, 19, 275-288.
- Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social Learning Theory and the Health Belief Model. *Health Education & Behavior* 15 (2): 175–183.
- Sallis, J., & Owen, N. (1997). Ecological models. In Glanz, K., Lewis, F., & Rimer, B. (Eds.), *Health behavior and health education: Theory, research and practice* (2nd ed., pp. 403-424). San Francisco: Jossey-Bass.
- Serwadda, D., Mugerwa, R. D., Sewankambo, N. K., Lwegaba, A., Carswell, J. W., Kirya, G. B., Bayley, A. C., Downing, R. G., Tedder, R. S., & Clayden, S. A. (1985). Slim disease: a new disease in Uganda and its association with HTLV-III infection. *Lancet* iii:849-852.

## A SOCIAL ECOLOGICAL APPROACH

- Shafer, L., Biraro, S., Kamali, A., Grosskurth, H., Kirungi, W., Madraa, E., & Opio, A. (2006). *HIV prevalence and incidence are no longer falling in Uganda - a case for renewed prevention efforts: evidence from a rural population cohort 1989-2005, and from ANC surveillance*. Sixteenth International AIDS Conference, Toronto.
- Smith, C. (2000). Content analysis and narrative analysis. Reis, H. (Ed.), In *Handbook of Research Methods in Social and Personality Psychology*. (314-327). Cambridge, UK: Cambridge University Press
- Stokols, D. (1995). Translating social ecological model into guidelines for community health. *American Journal of Health Promotion*, 10(4), 282-297.
- Stokols, D. (1992) Establishing and maintaining healthy environments. Toward a social ecology of health promotion. *American Psychologist*;13(1):6–22.
- Sumartojo, E. (2000). Structural factors in HIV prevention: Concepts, examples, and implications for research. *AIDS*, 14: S3–S10
- Uganda AIDS Commission. (2007). *Moving Toward Universal Access: National HIV & AIDS Strategic Plan 2007/8 – 2011/12*. Uganda AIDS Commission, Republic of Uganda
- Uganda AIDS Commission. (2011). *Draft National HIV & AIDS Strategic Plan 2011/2 – 2014/15*. Uganda AIDS Commission, Republic of Uganda
- Uganda Bureau of Statistics. (2010). *Executive Summary*. Retrieved from <http://www.ubos.org/UNHS0910/executivesummary.html>
- Uganda Congress Bill No. 4. (2011). HIV and AIDS Prevention and Control Bill.
- Uganda Congress Bill No. 19. (2009). Anti-Homosexuality Bill.
- United Nations Program on HIV/AIDS [UNAIDS]. (2012). *Country Progress Report: Uganda*. Retrieved from [http://www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2012countries/ce\\_UG\\_Narrative\\_Report\[1\].pdf](http://www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2012countries/ce_UG_Narrative_Report[1].pdf)
- United Nations Program on HIV/AIDS [UNAIDS]. (2011). *Epidemiological Fact Sheet: Uganda*. Retrieved from [http://158.232.15.29/CFS/downloadpdf.htm?country\\_id=AFRUGA&lng\\_code=en&pdfoption=epi](http://158.232.15.29/CFS/downloadpdf.htm?country_id=AFRUGA&lng_code=en&pdfoption=epi)

## A SOCIAL ECOLOGICAL APPROACH

World Health Organization [WHO]. (2011). *Data on the size of the epidemic, Number of adults, women and children living with HIV*. Retrieved from [http://www.who.int/hiv/pub/progress\\_report2011/summary\\_en.pdf](http://www.who.int/hiv/pub/progress_report2011/summary_en.pdf)

World Health Organization. (2011). *Global HIV/AIDS Response: Epidemic update and health sector progress towards Universal Access*. (2011). Retrieved from [http://whqlibdoc.who.int/publications/2011/9789241502986\\_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789241502986_eng.pdf)

APPENDIX I

FOCUS GROUP PROTOCOL

First, the discussion group facilitator will introduce himself or herself and convey the following information:

The reason for conducting the discussion group is to find out about how we might be able to help people who live in the fishing communities protect themselves from HIV and risky alcohol drinking.

You do not need to answer any questions you don't feel comfortable answering and you can leave the discussion at any time if you would like.

There are no right or wrong answers.

The group is *not* trying to reach an agreement; you may disagree with others as long as you do it in a respectful manner.

The session is being audio recorded so that I can refer back to it and not miss what has been said. So that we can protect your privacy we ask that you do not say your name during this discussion.

During the session, please make sure you speak one at a time, so that when I listen to the tape I can understand what people said.

Please keep what you hear in this room to yourself. We will be asking you to sign a promise stating that you will not repeat outside of this discussion group what others have said.

Even though we are asking everyone here not to repeat anything that is said in this room, there is always the chance that what you say may be revealed outside of this group by one or more of the other group members, so please don't share anything during the discussion that you might be uncomfortable with having others hear.

Please be honest and free in what you say. No one is here to judge you. We are here to understand some of the challenges of trying to be safer regarding preventing HIV and risky alcohol drinking. We understand that it is difficult to always make healthy decisions, and that sometimes people make unhealthy decisions. It is important that you understand that whatever we talk about here today will *not* be told to anyone in the community. Only the research staff will know what you said. You've also agreed that you won't discuss anything we talk about in this room with anyone else. Although we cannot *guarantee* that no one will reveal anything outside of this group, we certainly hope that everyone will keep everything that he/she hears completely to himself/herself.

Remember that you do not have to respond to any questions that you feel uncomfortable answering.

APPENDIX II

FOCUS GROUP DEMOGRAPHIC DATA FORM

Date: Time:				Focus Group #				
	P1	P2	P3	P4	P4	P6	P7	P8
1. Gender								
2. Age								
3. Tribe								
4. Religion								
5. Education level								
6. Marital Status								
7. How many wives								
8. Village								



APPENDIX III

FOCUS GROUP SUGGESTED QUESTIONS

Fishermen:

- How and when did you start fishing?
- What are the benefits and challenges of this work?
- How much do you usually earn per day?
  
- How much do you spend on drinking alcohol per day?
- How often do fishermen have sex with sex workers?
- Do most people in the community drink alcohol?
- Is alcohol use a problem in the community?
- Do people take alcohol before/during/after sex in this community?
- How do you think alcohol affects sexual behavior?
- How can we help people reduce how much alcohol they drink?
  
- Do you perceive HIV/AIDS as a problem in the community?
- In this community, how can we prevent people from getting HIV?
- Do people use condoms? Why or why not? With whom? With whom not?
  
- Where can you access health information, both general and specific?
- Where can you access health care including HIV testing and HIV prevention services?
- Why do you choose to go to that specific place to access services?
- What kind of change (i.e., intervention) would you like to see?
  
- What do you do in your free time?
- What would you like to do in your free time but haven't had the opportunity to do?

## A SOCIAL ECOLOGICAL APPROACH

Fishmongers:

- How and when did you start selling fish?
- What are the benefits and challenges of this work?
- How much do you usually earn per day?
- Do you have any other sources of income?
  
- How much do you spend on drinking alcohol per day?
- Do most people in the community drink alcohol?
- Is alcohol use a problem in the community?
- How can we help people reduce how much alcohol they drink?
  
- Is HIV/AIDS a problem in the community?
- Do people take alcohol before/during/after sex in this community?
- How do you think alcohol affects sexual behavior?
- Do people use condoms? Why or why not? With whom? With whom not?
- (For MEN): How often do men have sex with sex workers?
  
- Where do you access health information, both general and specific?
- Where do access health care including HIV testing and HIV prevention services?
- Why do you choose to go to that specific place to access services?
- In this community, how can we prevent people from getting HIV?
- What kind of change (i.e., intervention) would you like to see?
  
- What do you do in your free time?
- What would you like to do in your free time but haven't had the opportunity to do?

## A SOCIAL ECOLOGICAL APPROACH

### Alcohol Sellers/Restaurant Owners:

- How and when did you start selling alcohol?
- What are the benefits and challenges of this work?
- How much do you usually earn per day?
- If you drink alcohol, how much do you spend per day drinking alcohol?
- Do most people in the community drink alcohol?
- Is alcohol use a problem in the community?
- How can we help people reduce how much alcohol they drink?
  
- Is HIV/AIDS a problem in the community?
- Do people take alcohol before/during/after sex in this community?
- How do you think alcohol affects sexual behavior?
- Where do you access health information, general and specific
- Where do you access health care including HIV testing and HIV prevention services?
- Why do you choose to go to that specific place to access information?
- In this community, how can we prevent people from getting HIV?
  
- What kind of change (i.e., intervention) would you like to see?
- Do people use condoms? Why or why not? With whom? With whom not?
- Who buys alcohol, what days, at what time?
- Is there any variation based on time of day, day of week, or season?
- Does the variance affect income?
- Is selling alcohol sufficient income to provide for your family? Do you have any other occupation?
- Do people in this community get/give things other than money (e.g., food, etc.) in exchange for sex?
- What do you think would happen if people drank less alcohol? Would it be good? Bad?

## A SOCIAL ECOLOGICAL APPROACH

- What would you do if people stopped buying alcohol?
- What do you do in your free time?
- What would you like to do in your free time but haven't had the opportunity to do?

### Commercial Sex Workers:

- How and when did you start engaging in this kind of work?
- What are the benefits and challenges of this work?
- How much do you usually earn per day?
- If you drink alcohol, how much do you spend per day drinking alcohol?
  
- Do most people in the community drink alcohol?
- Is alcohol use a problem in the community?
- How can we help people reduce how much alcohol they drink?
- Do people take alcohol before/during/after sex in this community?
- How do you think alcohol affects sexual behavior?
  
- Is HIV/AIDS a problem in the community?
- In this community, how can we prevent people from getting HIV?
- 
- What payment methods do you accept? – i.e., cash versus food or goods.
- Is there communication before/during/after intercourse?
- Is there opportunity to negotiate terms of sexual encounters – for example, condom use, price, location, & time.
- Do you form long-standing relationship with any customers or other men?
- How do you provide for your family? Do you have other sources of income?
- What do you do in your free time?
- What would you like to do in your free time but haven't had the opportunity to do?
  
- Do you use condoms? Why or why not? With whom? With whom not?
- Where do you get condoms? How much do they cost?

## A SOCIAL ECOLOGICAL APPROACH

- If you use a condom with a client, who provides the condom, you or the client?
- Where do you access health information, general and specific?
- Where do you access health care including HIV testing and HIV prevention services?
- Why do you choose to go to that specific place to access services?
- What kind of change (i.e., intervention) would you like to see?