HHS Public Access

Author manuscript

*AIDS Behav*. Author manuscript; available in PMC 2017 March 01.

Published in final edited form as:

*AIDS Behav*. 2016 March ; 20(3): 537–547. doi:10.1007/s10461-015-1077-z.

# "Such behaviors are not in my home village, I got them here": A qualitative study of the influence of contextual factors on alcohol and HIV risk behaviors in a fishing community on Lake Victoria, Uganda

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## Abstract

In Uganda, elevated HIV prevalence in fishing communities along Lake Victoria have been attributed in part to heavy alcohol use, but qualitative research is needed to understand the contextual factors influencing alcohol and sexual risk. Eight focus group discussions were conducted (N=50; 23 male, 27 female) in Gerenge, Uganda with five occupational groups: fishermen, fishmongers, alcohol-sellers, commercial sex workers (CSWs), and restaurant owners. Data was analyzed using content analysis. Alcohol use was prevalent, and said to influence risky sex. Sex-related alcohol expectancies and occupational factors influenced individuals to drink during sex and structural factors related to the built environment, economy, and policy were identified as key contributors to both alcohol use and sexual risk in general. The findings highlight alcohol reduction as an important component of HIV/AIDS prevention, and suggest structural interventions should be prioritized in this context.

### Keywords

HIV/AIDS; Alcohol; Fisherfolk; Commercial Sex Workers; Qualitative; Social Ecology

## Introduction

In countries most affected by the HIV/AIDS epidemic, mobile populations such as mine workers, truck drivers, and fisherfolk have substantially higher HIV prevalence than the general population [1, 2]. Ugandan fisherfolk (i.e., fish catchers, processors, and traders) in the communities surrounding Lake Victoria are no exception; HIV prevalence is estimated to be as high as 30% in some fishing landing sites[3] compared to the national prevalence of

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7.3% among those 15–59 [4]. Moreover, these communities on Lake Victoria, often referred to as landing sites, are known to have a large presence of commercial sex workers (CSWs), high rates of transactional sex (i.e., sex for money, fish, or other goods), and elevated levels of alcohol consumption[3, 5, 6]. Support for a link between alcohol use and HIV/AIDS has been increasingly growing in the broader HIV/AIDS literature, with evidence to demonstrate both direct and indirect influences of alcohol on HIV risk [7–12]. Tumwesigye and colleagues[13] found hazardous levels of alcohol consumption, and a strong correlation between drinking more than two times a week and engaging in transactional sex, among Ugandan fishermen. Other quantitative studies in Ugandan fishing communities consistently demonstrate alcohol users are at an increased risk of being HIV positive[14–19].

Though quantitative evidence supports the co-occurrence of high rates of alcohol consumption and elevated HIV prevalence in Ugandan fishing communities and correlational relationships between these two factors, fewer studies delve into the multifaceted relationship between alcohol use and HIV risk behaviors among this high-risk population in Uganda, which may be best accomplished through qualitative research. Current evidence paints a picture of fishing communities as a subculture of risk-takers living within hyper-masculine and sexualized normative environments that promote sexual risk behavior [1, 3, 20]. Moreover, the landing sites are characterized by the large presence of bars and “lodges” or rooms rented on a short-term basis for use by CSWs and their clients[21]. However, the role of alcohol within such complex environments has not been qualitatively examined. As demonstrated by a recent study by Mbonye and colleagues[22] among Ugandan sex workers in Kampala, qualitative research exploring the context and social situations in which alcohol and sexual risk occur may shed light on the role of alcohol in HIV risk behaviors and suggest potentially effective intervention approaches. They identified social and occupational factors in the context of sex work, such as peer influence, a drinking work culture, and alcohol use as an occupational coping mechanism as major drivers of alcohol use during sex with clients [22].

Such contextual factors may also be important contributors to HIV and alcohol risk on landing sites, though they likely differ from that of an urban setting. The landing sites are commonly rural areas distant from health care services and other resources[23], made up of a highly mobile and semi-permanent population[24–26]. Fishermen typically move from site to site in search of better fish yields and a large population of CSWs follows the fishermen as they move. The rest of the community typically includes individuals involved in the fishing business (i.e., fishmongers) or providing services to those who work in that trade (i.e. alcohol sellers, restaurant owners, shopkeepers). These individuals are also at increased risk for HIV, partly due to their sexual relations with fishermen [1, 27, 28], though their role in the larger transactional network is less understood in terms of HIV and alcohol risk and should be examined.

Given the unique social, economic, and environmental circumstances of such highly mobile populations at landing sites, contextual factors may play a large role in heavy alcohol use and high sexual risk behavior observed in these communities and should be explored further. With this aim, the present study conducted focus groups with individuals living in a fishing community in Wakiso Districton Lake Victoria, Uganda. We concentrated on groups that

were most closely involved with the local fishing industry/trade and whom most frequently interact with fisherman, thought to be at the highest risk for HIV: fishermen, fishmongers, alcohol-sellers, CSWs, and restaurant owners. Our main objective was to explore the social and contextual dynamics that facilitate alcohol and sexual risk behavior in fishing villages on Lake Victoria in Uganda. We specifically examined motivation for alcohol use and perceptions of how alcohol use influences sexual behavior and HIV risk. We also examined contextual and structural factors influencing alcohol use during sex, as well as alcohol use and sexual risk in general in the community. In addition we elicited suggestions for interventions to reduce alcohol and HIV risk behaviors in fish landing sites.

## Methods

### Participants and setting

A total of 50 individuals participated in one of eight focus group discussions conducted in Gerenge, Uganda in August 2012. Separate focus groups were conducted based on participant occupation, chosen to represent the majority of the population: two groups of fishermen (n=13; all male), two groups of fishmongers (n=13; 9 male, 4 female), two groups of alcohol sellers (n=12; 1 male, 11 female), one group of CSWs (n=6; all female), and one group of restaurant owners (n=6; all female).

Gerenge, Uganda is one “landing site” or community along Lake Victoria, approximately 30 minutes from Entebbe, a major town where the international airport is located. Gerenge is a rural community with a population of approximately 1,000, and was selected as the setting for the present study because of the known presence of transient CSW and fishermen populations. Gerenge residents live in nonpermanent housing made of wood and aluminum with poor sanitation and limited access to electricity and running water. The roads in Gerenge are dirt and residents rely on public minibuses and motorbikes for transportation from the town to the main road and the nearest larger town: Entebbe. Gerenge is at the end of an unpaved road approximately 30 kilometers from the main road, from the main road to Entebbe is another 15 kilometers. Gerenge lacks access convenient to health services; Kisubi Health Center, a Health Center III facility, is the closest healthcare facility is approximately 30 kilometers away. Health Center III facilities include a maternity ward and outpatient services, including free HIV counseling and testing and HIV treatment. Members of the community also travel to Entebbe for health services, which includes a District level hospital, as well as several private health centers. Local community-based organizations sometimes provide HIV prevention outreach, though these are sporadic and usually narrowly focused to include only information dissemination, condom distribution, and referrals to healthcare facilities for more comprehensive services. Less frequently, mobile HIV counseling and testing and male circumcision services are offered in the community by health facility outreach.

Gerenge contains bars, restaurants, and small shops to cater to the fishermen and other village residents. In addition to fishermen and CSWs, the village population largely consists of individuals working at such establishments or in support the fish trade (restaurant owners, alcohol sellers, fishmongers). Restaurant owners are typically women who run small restaurants with 4 to 10 seats; most male village residents typically eat at least one meal per

day at a restaurant since they have no cooking facilities of their own. Most community members are either single or have a steady partner or spouse living elsewhere. Fishermen spend their nights fishing on Lake Victoria and sell their fish to fishermongers in Gerenge to be sold within the village or in the capital city of Kampala. Typically, fishermen stay in the villages for temporary periods of time ranging from several weeks to months, moving to another landing site when fishing yields decrease. When the fishermen population declines, many CSWs also move to other landing sites where there are more clients. This description of Gerenge is gathered from personal communication with field outreach workers from the partnering community-based organization Wakiso Integrated Rural Development Association (WIRDA) (J. Kibuuka& S. Namukonge, oral communication, May 2012), as well as the authors' direct observation. Many of the characteristics of Gerenge described are similar to the context of other fishing communities in the literature, including its rural setting and distance from health care services and other resources [23], its highly mobile population [24–26], and the presence of alcohol establishments and CSWs [21].

Eligibility for participation required being in one of the five occupational groups of focus: fishermen, fishmongers, alcohol sellers, CSWs, restaurant owners. Participants were excluded from participation if they were unable to speak Luganda (the language spoken by the majority of the population), under the age of 18, or intoxicated at the time of the interview. Furthermore, self-identifying as being part of one of these occupational groups was also part of the eligibility criteria. Participants self-reported their occupation on demographic questionnaires, and were asked their occupation, and details about how they began this work and how long they had been working, before each focus group. Had any participant reported belonging to a different occupational group than the one they were placed, they would have been excluded from the focus group or placed in the appropriate focus group; however, this did not occur.

## Procedure

The research team worked in collaboration with a local community based organization, Wakiso Integrated Rural Development Association (WIRDA), for community mobilization and participant recruitment. We also worked in collaboration with a resident community mobilizer and with the Beach Management Unit (BMU) at the landing site. The BMU is an elected organized group of local leaders representing the interests of the community. WIRDA and the community organizer worked with the local BMU to identify the local "group leaders" representing each occupational group. Group leaders are chosen by the group and they represent the interests of their respective occupation in the community. The group leaders then identified and recruited members of their respective groups: fishermen, fishmongers, alcohol sellers, and restaurant owners for participation in the study. A different recruitment approach was taken with CSWs, given their stigmatized status in the community. The research staff first provided a half-day sensitization seminar to BMU members to inform them of the importance of confidentiality and cultural sensitivity in the recruitment process. Social gatherings sponsored by the BMUs and facilitated by the CSW group leader were then held with CSWs in order to build trust and inform them about the study before recruitment. BMUs also relied on word of mouth referrals within the CSW community to recruit CSWs to participate in the study. Before the start of each focus group a

Luganda-speaking focus group facilitator explained the purpose of the study and obtained informed verbal consent, following the procedures approved by the Institutional Review Boards at the University of Connecticut Health Center in the United States and the National HIV/AIDS Research Committee (NARC) in Uganda. The Uganda National Council for Science and Technology also approved the study.

At the beginning of each focus group discussion, participants filled out a brief questionnaire collecting only demographic information (i.e., sex, age, education). Focus groups were conducted by an experienced facilitator in Luganda using standard focus group procedures [29] and following a protocol adapted from prior work by the research team in Uganda [30]. Initial meetings with key informants in the community also informed development of the protocol, including local council leaders and other local experts. Their description of the context of the fishing village, as well as their expertise on the occurrence of alcohol use and HIV risk behaviors in the community, informed the tailoring of the protocol to the study environment. The protocol included semi-structured, open-ended questions aimed to elicit information about the participants' occupations and work environment, perceptions of alcohol use and HIV risk in the community and factors that influence alcohol and HIV risk, and suggestions for interventions. The focus groups were conducted until saturation was reached. Each lasted approximately 90 minutes and all but one focus group was audio recorded. Due to technical difficulties, one focus group was not recorded but two research assistants took detailed notes throughout the discussion. Participants were provided refreshments during the focus groups, as is standard practice in similar community meetings in Uganda.

### Analysis

All audio-recorded data were transcribed and translated into English by two research assistants. Data were analyzed using content analysis (Smith, 2000). Using a priori categories informed by a social-ecological approach, a coding scheme was developed before analysis. The social-ecological approach is a model for health promotion that views individuals within their larger social and environmental contexts [31–33]. It was chosen to guide the analysis because it recognizes the interactive effects of multilevel contextual and individual factors on health behavior and outcomes. The coding scheme was then modified after review of the transcripts by the principal investigators (PIs). After a trained research assistant coded the data in consultation with the PIs, the authors identified and agreed upon the major themes.

## Results

There were 23 males and 27 females in the study. The average age for men and women was 28.9 (range 20–47) and 31.7 (range 22–52), respectively. The majority of men were married (73%), but less than half of women were married (41%). The most predominant religion was Catholicism (53%) followed by Muslim (22%) and most participants had some primary (41%) or some senior level (31%) education.

There was consensus among focus group participants that alcohol use was prevalent in the community among all people. Fishermen were thought to be the most frequent and heavy

drinkers, especially as reported by alcohol sellers. The majority of participants viewed alcohol use as a community problem and most felt that heavy drinkers had little respect in the community. Alcohol use was especially considered problematic when resulting in public obscenity, violence and aggression, and individuals refusing to pay for services they have bought (i.e., food, alcohol, CSWs). Despite concerns about the impact of alcohol use on the community, all participants recognized alcohol as an integral component of the local economy. The economic importance of the alcohol industry was a major factor influencing participant's attitudes towards alcohol use, as explained by one fish seller: *"Alcohol use is not a problem if the one drunk doesn't become chaotic, because even alcohol sellers make money from it"*(male, age 23).

Similarly, all participants were aware of HIV/AIDS, and agreed that it was a major issue at the landing sites. As exemplified by this quote from an alcohol seller:"*[We] are aware of the existence of HIV/AIDS in the area, and fishermen have it*" (female, age 29), fishermen again were perceived as the riskiest group. Condom use in general was believed to be low and commercial sex work prevalent, though CSWs were known among the participants for almost always insisting on condom use.

## Alcohol's Role in Sexual Behavior

Participants in the focus groups recognized a link between alcohol use and sex. Alcohol use during sex was most frequently discussed in the context of commercial sex, both of which were viewed as a main source of leisure for men in the community, and were said to go hand-in-hand: *"If a fisherman doesn't drink alcohol, he doesn't indulge in commercial sex. It's those who drink that engage in commercial sex"* (fisherman, age 24).

Focus groups further revealed social and contextual factors related to sex work as key drivers of alcohol use during sex. On an interpersonal level, alcohol use is part of the standard ritual between CSWs and their clients, where men commonly initiate and maintain relations with CSWs by purchasing alcohol for them. The main motivations reported by CSWs for alcohol use during sex were related to the nature of their work. The effect of alcohol on sexual arousal and behavior was cited as desirable and often the motivation for alcohol use, especially among CSWs. Participants felt that drinking alcohol increases the likelihood that someone will have sex by increasing their desire for sex: *"When others [CSWs] drink alcohol, it puts them in moods of love, they become excited and…become interested in sex"* (CSW, age 33). CSWs cited using alcohol during sex so that they can become more sexually forward with clients. CSWs were also motivated to use alcohol during sex alcohol as a coping mechanism to deal with their work and to have sex with men they are uninterested in, as one CSW (age 33) said, *"…you cannot manage fishermen or even other men… whom you are not in love with…with normal brains."* Furthermore, CSWs use alcohol during sex to gain control over their clients, as explained by one CSW (age 30): *"When I take alcohol, I get determined in what I do, if I command you to put on your trousers and get out, you get outside immediately but if you refuse to get out, I forcefully push you outside and dress up from there or else we fight*."

While many CSWs felt alcohol allowed them to gain control and sexual power with clients, the focus groups also revealed other outcomes of alcohol used during sex that contradict this

viewpoint. Most participants agreed that having sex under the influence of alcohol increases the likelihood of having unprotected sex, citing several specific pathways. As one alcohol seller (female, age 29) explained, alcohol use reduces one's perceived vulnerability: *"Women too don't fear men. They one time suspected and feared [and] could prefer having protected sex, but with the excitement of alcohol, women will have already forgotten about protected sex."* The effect of alcohol on one's judgment and alertness was a common theme throughout the focus groups, as demonstrated in the following quotation: *"There are some who drink and are tricked to go without condoms…[the client] removes the condom for live[unprotected] sex and when you are drunk already and weak. You don't have power to fight him as he removes the condom"* (CSW, age 33). This quotation also highlights alcohol's influence on sexual decision-making power between men and women. Alcohol use was said to reduce women's ability to negotiate condom use in the moment and increase men's aggression during sex, mainly in reference to CSWs and their clients. Specifically, CSWs said when clients drink, which is reportedly often, they are more likely to be forceful during sex, break condoms, and insist on not using condoms.

### Other factors influencing alcohol use and HIV risk behavior

In addition to using alcohol for different reasons related to sex, participants identified contextual factors that influence alcohol consumption and sexual risk independent of each other. The effect of these factors on alcohol use and sexual behavior, however, were often similar and are therefore are presented together in the following section.

**Occupational—**Similar to CSWs as previously discussed, fishermen cited alcohol use as a common coping mechanism to deal with work related stress. A significant number of work related stressors and hazards were said to come with the occupation of fishing, including daily physical danger related to occupational hazards on the lake and financial stressors due to inconsistent and unpredictable income dependent on catch yields. Moreover, many participants stated that the dangerous working conditions associated with fishing cause fisherman to "live for the moment" and not fear HIV/AIDS. As one fishermen (age 36) stated, *"…AIDS doesn't kill instantly, the risks of dying from AIDS are fewer than drowning."* With death on the lake viewed as a more imminent threat than death from AIDS; *"fishermen only fear only when they are about to die, they don't fear sick [HIV infected] women"* (alcohol seller, female, age 29).

**Economic—**Both alcohol selling and commercial sex work were considered staples of the local economy. Moreover, unprotected sex, known as "live sex," is considered more valuable and priced higher with CSWs because of the additional risk, as one alcohol seller (male, age 32) explained, *"CSWs strictly use condoms at three thousand shillings only [~ $1.25], if they decide to go for live sex, it costs ten thousand shillings [~ $4] or more."* While CSWs had a reputation for insisting on condom use, participants agreed there were sometimes cases where CSWs were willing to have unprotected sex due to financial need: *"…they don't want to miss the fifty thousand shillings"* (CSW, age 29).

Even outside of commercial sex work, sex is treated as a commodity, with transactional sex reportedly common among other community members. Other women, namely alcohol

sellers, sometimes engage in transactional sex, in addition to their primary occupation of selling alcohol, both for cash and other goods, such as *"food and charcoal"* (alcohol seller, female, age 32). Similarly, CSWs said they sometimes accept partial payment for sex in nonmonetary forms, including fish, other food, and alcohol, as one fishermen (age 38) explained: *"Bargaining for sex depends on whether you have bought alcoholic drinks for her and some women wish to eat chips and fish."* One alcohol seller (female, age 29) described the mutual exchange for goods and sex with fishermen: *"…that's how they entice women, especially in exchange for food. One can give a tilapia, Nile perch, a bunch of matooke [a type of banana]. If he gives you cash, you treat your hair, and you buy a dress because he also wants to benefit."* Similar to exchanges with CSWs, it was said that men provide more goods (money, food) for unprotected sex with non-CSWs, and CSWs felt women outside of commercial sex work were more likely to be influenced to have unprotected sex as explained by one CSW (age 30):

> When I looked at it, it is the cause of disease transmission especially women who cook food, bar attendants, they mostly have [live sex]. For us [CSWs], they abuse, we know how to protect ourselves, because for me I can slap a man when he tries bursting a condom, but the ladies who work in bars or restaurants, the moment given fifty thousand shillings they give in.

Furthermore, alcohol use, commercial sex work, and transactional sex were all closely tied to the local fish economy. When the fish economy is thriving, alcohol use and transactional sex were increased in the community due to the increased cash flow. The fish economy is dependent on multiple environmental factors including the winds, tides, and fish movement. As one alcohol seller (female, age 22) stated *"during windy periods, fishermen don't work; [they] don't have money so they don't drink."* Alcohol sellers also reported that during periods of weak alcohol sales they will also engage in sex work to survive.

**Structural Environment—**When the local economy is doing well, a lack of access to bank accounts or mechanisms for saving money was said to leave fishermen with "cash in hand" to spend on alcohol and CSWs: *"they [fishermen] take chances; once he gets cash, he goes to enjoy. Generally you find one going to the lake, while the other coming from the lake to the bar for alcohol"*(alcohol seller, female, age 30). CSWs were said to have the same problem, as demonstrated by one CSW's personal experience:

> *Where problems arose, I didn't have an account, I took that money home. I started looking for my friends, started using it slowly by slowly, drunk alcohol and as you know Commercial Sex Workers, we want fashionable things…I spent the money because I didn't have an account.* – CSW (age 32)

In reference to sexual risk and alcohol use, the focus groups highlighted the influence of the social and built environment on behavior. Many participants explained that they did not engage in risky behaviors before coming to the landing sites. For example, one fisherman (age 36) stated, *"…such behaviors are not in my home village, I got them here."* Some participants attributed their risky behavior to the accessibility of alcohol and CSWs. Alcohol establishments were described as an integral part of the landing sites' environment. As one fisherman (age 25) described, *"whoever comes from where ever, first tries a bar."* The

constant availability of CSWs was also highlighted, as another fishermen (age 36) said *"…after fishing, 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."*

**Policy—**Participants discussed non-adherence to Ugandan laws regulating the sale or consumption of alcohol as influencing heavy use of alcohol on the landing sites. Namely, participants claimed that bars are often open all night, and there was a lack of regulation on the amount one is permitted to consume at a given time.

> *If somebody drinks alcohol peacefully not exceeding the recommended time, Uganda laws sometimes work but people violate them. Sometimes we come very early in the morning at 4:00 am, we find people still in bars and whoever comes from the lake enters an open bar.* - Restaurant owner (female, age 37)

## Suggestions for Interventions

**Individual—**Many participants felt there was a need for increased education on HIV/AIDS, recommending regular seminars and educational films, as one alcohol seller (female, age 30) suggested: *"I suggest consistent seminars to help people understand. If you use visual aids, wise people will learn…people should get regular seminars with visual aids, and they will change the behaviors, caring about their lives."*

**Structural Interventions—**The majority of interventions participants wanted to see on the landing site were structural, including increasing access to HIV prevention services and health care in general. Many participants mentioned the need for construction of a hospital or healthcare facility on the landing site, in order to increase their access to services. All occupational groups, but CSWs especially, thought condoms should be made more accessible by providing them at no cost. Similarly, *"conducting regular free HIV counseling and testing"* (alcohol seller, female, age 33) was commonly suggested as an HIV service to make more accessible on the landing sites.

Many participants also stated that the landing site communities needed mechanisms to save money, which they felt would reduce their spending on alcohol and CSWs because *"if they have cash in the pocket, they spend it all"* (fishermen, age 29). Two specific recommendations to address this issue were to set up a way for fishermen to get paid on a weekly basis, rather than getting paid all at once, and to build banks on the landing sites.

**Economic Interventions—**Microloans, skills training, and the creation of new job opportunities were among the most common suggestions in the focus groups regarding interventions for landing sites. Participants in all occupations cited financial hardship and a lack of other options as the reason they started their current work, but most participants said they could not sustain themselves or their families on their current income.

> *I ask, is there no help one can get if she is tired of this, to enable her get another job? Is that help available or someone can get a loan and start working? My friend I am tired, if there is aid, I am prepared even if you are given a loan, and you have to pay back slowly.* – CSW (age 30)

> *Create more jobs in the area to keep people busy. For example, the government buys a big boat for the girls, which brings mukene [type of fish], they clean and pack it for selling so that at the end of the month they earn something*. – Alcohol seller (female, age 30)

Similar to the lack of structural access to banks, was the need for increased access to credit and loans. Government assistance in setting up Savings and Credit Cooperative Organizations (SACCOs), which are savings/credit cooperatives owned, managed, and financed by its own members who identify as belonging to a common community [34], was suggested by focus group participants, as was more education on such options, as demonstrated by the following quote:

> *We are neglected, we have no address as a basis for acquiring loans from banks, because when we go to banks to get loans, we are asked to form groups and more sensitization of the Associations [SACCOs] is needed.* – Fisherman (age 26)

**Policy Interventions—**Participants recognized that policy-level interventions regulating the sale and consumption of alcohol would be an effective way to reduce drinking on the landing sites, and some participants made specific recommendations for how to do so, including banning the sale of alcohol altogether. There was also discussion of the need for stricter enforcement of existing regulations on the landing sites. For example, one fisherman (age 25) suggested, *"If the number of bars was reduced and tough laws observed, bars here would not open 24 hours. It would be better if a bar opened at 10:00 AM and closed at 9:00 PM."*

However, participants also recognized that a large number of people on the landing site rely on the alcohol industry for income, and that regulating the sale of alcohol would negatively impact much of the community, as demonstrated in the following quotes:

> *If there were ways of reducing alcohol drinking, they would do it, but since they don't have and it's the major business in the area, they have nothing to do*. – Fish seller (female, age 35)

> *It is not easy to reduce alcohol as it is one of the major businesses in the area and many people are running bars. Whenever alcohol sellers get customers, they become happy and if a customer asks for more beers, they feel happier because they make money*. – Alcohol seller (female, age 29)

## Discussion

The present study adds to our understanding of the role of alcohol use in HIV risk among fisherfolk in the communities surrounding Lake Victoria. Alcohol use was perceived to be prevalent across all community members at the landing site, and alcohol use during sex was common in the context of commercial sex work and thought to contribute to sexual risk taking. Several pathways have been proposed in the literature to explain a causal relationship between alcohol use and HIV risk [12]. Our findings support a direct behavioral pathway on HIV risk through alcohol's disinhibiting effect on cognitive functioning[12, 35]. It has also been proposed that alcohol increases one's risk for HIV through alcohol outcome

expectancies, which are beliefs about the effects of alcohol on behavior, mood, and emotion, which in and of themselves influence one's behavior [12, 36, 37]. For example, the expectation that alcohol leads to sexual enhancement is associated with more drinking in sexual situations, as well as an increased likelihood for unprotected sex [38]. Similarly, CSWs and sometimes fishermen in our sample were said to purposely drink during sex for sex-related outcomes expectancies related to sexual enhancement.

In line with a social ecological approach to health promotion [31–33], we identified interacting multilevel factors influencing alcohol and sexual risk. Social and occupational motivations for alcohol use during sex were identified among CSWs, which are similar to findings recently reported among urban CSWs in Kampala [22]. In both samples, the occupational and social context of sex work itself influences alcohol use: men buy alcohol for CSWs and sometimes pay for sex with alcohol, and CSWs often use alcohol as a coping mechanism to deal with the emotional stressors of sex work and drink to overcome the gendered power divide inherent in transactional sex [39]. However, contradictory to the belief that alcohol use increases control, CSWs commonly stated that alcohol had the opposite effect on their sexual power, causing them to give into or be tricked into unprotected sex with clients. The data suggest women's sexual power is further diminished by the effect of alcohol on men's behavior; in line with prior research [22], violence and aggression resulting from male client's alcohol use increases women's risk for HIV through several pathways, including direct transmission of HIV through forced sex and indirectly by reducing women's ability to negotiate safe sex [40]. Future interventions should consider the intersection of gender-based violence and HIV risk in the context of sex work, and the exacerbating role of alcohol use in this relationship. There is also a need to alter the false and dangerous expectancies that alcohol use will increase women's ability to protect themselves in this CSW population.

In addition to the social and occupational context of sex work, multilevel determinants related to political and economic factors, and the built environment interact to further influence risk behavior. For example, the mere presence of alcohol establishments and commercial sex in the landing sites was said to have a strong influence on behavior. Participants often stated that they learned these risk behaviors on the landing site, never having engaged in them previously, supporting the theory that health-risk behavior can be socially produced and transmitted[41, 42]. Researchers have previously described settings characterized by heavy drug use and high HIV transmission as "risk environments," where a lack of protective products (health and HIV prevention resources, positive leisure activities) and availability of harmful consumer products (alcohol, drugs, CSW) exogenous to the individual interact to influence risk taking and community norms sanctioning risk[23, 43–45]. As participants adopt these risk behaviors, they then influence the normative and social environment themselves, contributing to the reciprocal reinforcement of risk between the individual and their environment, as posited in the social ecological approach to health promotion [31–33]. This data highlights the need for interventions that modify community norms around risk-taking by changing the social and physical environment [43]. In this particular setting, interventions providing alternative leisure activities and access to health and HIV prevention resources (e.g., making condoms available at local bars and lodges,

providing community-based HIV testing) or more strictly enforcing regulations on the sale of alcohol may be beneficial.

Other structural factors identified as increasing alcohol and sexual risk behavior included a lack of access to banks, credit, and mechanisms to save money, as found in previous studies with fisherfolk[27]. Without financial infrastructure in place, innovative solutions to address fisherfolks' inability to save money are needed. For example, Kambewa and colleagues[27] implemented an intervention to reduce HIV risk among female fish traders in Malawi by building fish traders' economic skills through the formation of self-regulated savings groups with community members through a series of trainings and skills-building workshops. A qualitative evaluation found the intervention led to reductions invulnerability to HIV and increased positive social and economic outcomes for women [27]. Promoting the use of mobile money, an electronic service allowing cash to be sent or received via mobile phone from anywhere in Uganda, may also be a feasible savings mechanism in this context. Such services do not require access to a physical bank, but only a mobile phone to accept and dispense cash. In 2013, 60% of Ugandans owned a mobile phone[46] and mobile money is increasingly utilized in Uganda [47]. Pilot work on the acceptability of mobile money in fishing communities, and the subsequent influence on savings, is needed.

Poverty and a lack of work opportunities also emerged as underlying factors driving risk behavior in the focus groups. Transactional sex was found to be common among non-CSWs, including the fish-for-sex phenomena documented in fishing communities throughout sub-Saharan Africa[6, 39]. With the sale of alcohol and commercial sex work being among the main sources of income for much of the female population, efforts to reduce commercial sex work or the sale of alcohol in this community will not be accepted by the community without the creation of alternative sources of income. Income-generating interventions, including microfinance and job skill training were suggested by focus group participants, and for those women interested in a new occupation, it may be an effective approach to risk reduction. A recent systematic review of the impact of microfinance programs found limited and inconclusive evidence that such programs reduce women's sexual risk [48]. However, the few studies providing vocational training/microfinance to CSWs (n=2) [49, 50] and bar matrons (n=1) [51] in this review showed some success, reporting reductions in the number of sex partners among participants post intervention[48]. However, none of these studies included sex workers in fishing communities. For CSWs interested in finding new work in the fishing communities, as not all have a desire to leave sex work, income-generating interventions should be explored in future research. The Beach Management Units discussed earlier could potentially play an important role in such interventions. While the role of BMUs as currently written into legal policy focuses only on their involvement in the regulation of the fishing industry, excluding any language regarding their role in public health matters[52], they may be mobilized to indirectly improve such outcomes through job creation to offer alternatives to high-risk occupations, or the enforcement of regulations on the sale of alcohol. Furthermore, local council leadership could play a similar role in deterring alcohol use and risky sexual behavior by advocating for interventions and programs to address these behaviors.

### Limitations

While our study provides insight into community member's perspectives about alcohol use and HIV risk on the landing site, the qualitative nature of the data and small sample size limit our ability to generalize the findings to the broader population. The data provides rich context to alcohol use and HIV risk behaviors in this setting; however, we do not know the prevalence in which these risk behaviors actually occur, and cannot infer causation between alcohol use and sexual risk behavior based on this data. Additionally, social desirability may have influenced participants' responses during focus groups, especially on sensitive topics related to HIV, substance abuse, and sex work. Furthermore, the nonsystematic recruitment used to identify individuals for participation is a limitation of the study, as it may have resulted in selection bias.

Moreover, we only elicit the perspectives of individuals living within this community, which limits our application of the social ecological model and ability to make recommendations for public health intervention. In order to better examine the reciprocal relationship between individuals and their environment future work should conduct a separate investigation of the environmental factors that influence these behaviors, rather than relying on individual's perspectives on how the environment influences their behaviors. Key informant interviews with HIV experts and local leadership [27, 53] and social network analyses[54, 55] have shed light on the influence of the social environment in the context of fishing villages in prior work, though, future work using a social network analysis approach should specifically examine the role of alcohol in sexual networks and exchanges. Moreover, a growing body of evidence demonstrates interactions between the ecosystem and the HIV/AIDS pandemic in East and Southern Africa [56]. In the context of fishing villages, ethnographic methods have been employed to map the spatial and social features of beaches/fish landing sites and migration patterns of women in the fish trade to better understand the "sex-for-fish" economy and its influence on HIV risk in Kenya [57]. Similar methods have been used to describe the social and economic consequences of changes to fish ecology and environmental degradation of Lake Victoria, and the subsequent implications on fisherfolk's transactional sex and HIV risk behaviors [58]. There is a need for more work that specifically employs methods that provide greater context to the social and physical environment in order to more fully utilize a social ecological approach to reduce alcohol and sexual risk behaviors.

## Conclusion

Alcohol abuse was identified as a community-wide problem among individuals in the fishing community, and alcohol use during sex as a driving factor of sexual risk among CSWs and fishermen. The findings highlight the importance of including alcohol reduction as a component of HIV prevention, and considering both individual and broader community-level interventions to reduce alcohol use and sexual risk. At the individual-level, alcohol risk-reduction counseling for community members may be beneficial, as well as interventions aimed to modify sex-related alcohol expectancies and to increase coping skills among CSWs and fishermen and condom use negotiation skills among CSWs, especially in the context of alcohol use. However, interventions focusing only on individual behavior are

likely to have a minimal effect in this setting without addressing more upstream factors and altering community norms sanctioning risk. Economic approaches, such as income-generating interventions, may have the potential to reduce risk taking through poverty reduction and empowerment. In the context of fishing communities with high accessibility to alcohol and CSWs, structural interventions that increase access to health promotion services, such as condoms and HIV testing also should be prioritized.

## Acknowledgments

We thank Joseph Kibuuka, Samuel Namukonge, and Hajara Kagulire for their role in data collection and transcription. This study was supported by National Institute on Alcohol Abuse and Alcoholism grant P01 AA019072 awarded to Peter M. Monti. Dr. Kiene was supported by a K01 Mentored Research Scientist Development Award from the National Institute of Mental Health K01 MH083536. K. Sileo was supported by a T32 Predoctoral Fellowship Award on Substance Abuse, HIV, and Related Infections from the National Institute of Drug Abuse T32 DA 023356, PI: SteffanieStrathdee.

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