

A typology of groups at risk of HIV/STI in a gold mining town in north-western Tanzania

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Abstract

Mining communities with migrant populations are high-risk locations for human immunodeficiency virus (HIV)/sexually transmitted infection transmission in Sub-Saharan Africa. Interventions presupposing certain groups to be at high risk, such as those working exclusively as commercial sex workers, may divert attention from other high-risk groups. Qualitative research was conducted in a small town adjacent to a large-scale commercial gold mine in north-western Tanzania. Objectives were to identify populations at high risk of HIV and suggest suitable behavioural interventions by gaining an understanding of sexual behaviour patterns in the town. Rapid assessment procedures were employed comprising participant observation, informal questioning and in-depth interviews.

Epidemiological categories of “core”, “bridging” and “general” populations may not be adequate to the understanding of risk. Many types of women were found to receive payment for sex, distinguished by permanency of residence, age, relationship status, accommodation and income-earning activity. Paying for sex and having multiple partners was common among most men.

The town was a high-risk environment as a result of the economic opportunities available there (in contrast to the poverty of surrounding areas), which were often accessed by offering sex in exchange for money or gifts.

In this environment, the potential for spread of HIV infection between sub-populations was high and identification of distinct high- and low-risk groups not possible. However, the methodology enabled the identification of different social circumstances of risk, such as residential arrangements, employment status and venues for recreation, associated with different types of people. Targeted interventions may be oriented to specific circumstances in order to address risk practices in a culturally appropriate manner. It is useful to think of risk environments rather than attributing risk to types of people, and to target interventions to these environments. The methodology also enabled an approach to interventions sensitive to different circumstances associated with risk within the town while identifying structural factors affecting risk at the level of the town as a whole.

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Introduction

Although mining communities are widely recognised as high-transmission areas for human immunodeficiency virus (HIV)/sexually transmitted infections (STIs) (Campbell, 1997; Meekers, 1994; Mosha, 1995; Obbo, 1993), understandings of risk in such locations tend to focus on the mining population itself and women working as commercial sex workers (CSWs). Risks associated with other types of migrant workers and other local residents are often neglected.

The research described here uses an ethnographic approach to develop a typology of groups at risk of HIV/STI based on local cultural understandings with the goal of informing the implementation of an HIV prevention programme in a mining location in Tanzania. Our research examines the risk behaviour of female recreational facility workers (FRFWs—women employed in bars, hotels, restaurants and video and disco halls) and male mineworkers, groups that studies have shown to be vulnerable to HIV/STI (Campbell, 1997; Kishindo, 1995; Mgalla & Pool, 1997; Mhalu, Hirji, & Ijumba, 1991; Williams et al., 2000) as well as other groups distinguished by common characteristics and behaviours.

This paper argues that we cannot clearly identify high- and low-risk groups in such a setting, which is characterised by high levels of migration by several categories of worker as well as the miners themselves. It also challenges the notion of core groups for risky behaviour, such as CSWs as distinct categories. In such a context, it is difficult to distinguish sex workers from other women who may sell sex. Paying for sex and having multiple partners was also very common among most men. Epidemiological categories of “core”, “bridging” and “general” populations may not adequately capture the complexity of sexual mixing between groups when describing the nature of risk within high-risk environments. An understanding of the context and complexity of risk is vital to the development of appropriate interventions.

Background

It is estimated that 7.8% of the adult population (aged 15–49 years) is living with HIV/AIDS in Tanzania (UNAIDS, 2002). Studies in urban areas (Barongo et al., 1992; Mnyika et al., 1994) and mining communities (Clift et al., 2003; Mosha, 1995) have shown substantially higher prevalences.

Mining communities are recognised as high-transmission areas for HIV and STIs in Sub-Saharan Africa (SSA) (Meekers, 1994; Mosha, 1995; Obbo, 1993). Increased risk of acquiring infection is related to the migrant status of individuals (Chirwa, 1997; Williams,

1999), since mine work is often temporary and families seldom accompany the working spouse (Haour-Knipe, Leshabari, & Lwihula, 1999). The lack of social support is one factor often cited as contributing to risk of HIV/STI amongst migrant workers such as truck drivers and miners. Increased risky behaviour amongst male mine-workers is also attributed to psychosocial processes of ‘fatality’ due to the often-dangerous nature of the working environment (Campbell, 1997; Bellaby, 1990). In this environment, opportunities for economic gain are widely perceived, encouraging circular or temporary migration amongst other migrants, including CSWs (Gysels, Pool, Kabunga, & Bwanika, 2001).

Previous HIV/STI programmes in mining settings initially focused on HIV/AIDS as an individual behavioural and biomedical problem (Campbell & Williams, 1999; Parker, 1996). This focus has shifted in recent years to include community activities, due to increasing understanding about how behaviour is embedded within complex socio-economic and cultural contexts that inform individual vulnerability to infection (Williams et al., 2000). This paper describes research to understand the characteristics of high-risk groups and the local context that contributes to their sexual behaviour.

During the past few years, there has been a resurgence of large-scale commercial gold mining in the Lake Victoria Goldfields of north-western Tanzania. Two large mines have started production since 1999. In contrast with other gold mining regions, particularly in South Africa (Campbell, 1997), the majority of the mine workforce is skilled or semi-skilled and educated workers (with secondary level education and above) from Tanzania and elsewhere. The mining expatriate population comprises workers from Australia, Canada, United Kingdom (UK), South Africa and Ghana.

The study took place in a town located 3 km from one of these large gold mines, formerly populated mainly by artisanal gold-miners, traders and rural farmers. Since the start of construction of a large-scale commercial mine in 1994 (producing for the first time in 2000), the population has grown substantially and is now estimated at around 12,000 people.

In 2000, a cross-sectional survey conducted in the town found an estimated HIV prevalence of 45% among FRFW. Twenty-nine per cent had serological evidence of active syphilis, 36% reported that they had been paid to have sex within the last week, while 49% reported that they had not used a condom in the last month. The HIV prevalence was 19% and 14%, respectively, among other women and men living in the town, and 10% in Tanzanian mine staff. Most Tanzanian male mine workers (63%) and male community members (64%) reported more than one sex partner in the last 12 months. Payment for sex was common, with 73% of adult male community members and 56% of Tanzanian male mine workers reporting that they had paid for sex

in the last year, usually within the town. Of these men, 70% of those from the community and 28% of Tanzanian mine workers reported not always using condoms for paid sex (Clift et al., 2003). While FRFWs are clearly at high risk of acquiring HIV/STI, these findings suggest that a number of groups, including regular partners of men with multiple partners, may also be at risk of acquiring HIV in this setting.

In 2000, the African Medical and Research Foundation Mine Health Project (AMREF MHP) was established, funded by the companies owning and managing the mines. The MHP focuses on prevention of HIV, other STIs, tuberculosis and malaria in communities within and neighbouring gold mines in the Lake Zone region. The intervention works through health promotion campaigns, sexual and reproductive health (SRH) outreach services, social marketing, peer and life skills education and Voluntary Counselling and Testing (VCT) centres. This research was undertaken to inform the activities of the MHP.

This study was based in the centre of the town where most recreational and income-earning activities take place, where residents from outlying areas come for trade and recreation and where the AMREF MHP concentrates its interventions. The centre is a semi-urban environment with many shops, guesthouses and recreation facilities crowded into a geographically small area and interspersed with dwelling houses. Building materials include wood, plastic sheeting, corrugated iron and mud bricks. The most common income-earning activities of residents are working on the mine site and informal business. There are frequent transport services running daily to the nearest towns including the regional capital, approximately 90 km away. There is no police station in the town and law and order is maintained through a system of *sungusungu*.¹

The specific research objectives for the study were:

1. To develop a typology of groups of people at risk of HIV in the town.
2. To understand how sex is negotiated (e.g. use of intermediaries, types of locations).
3. To understand the relationships within and between groups at high risk, and also between people at high risk and people at lower risk.

This paper focuses on the first and third objectives.

¹'Sungusungu' are local militia, under the direction of the village government and paid for through contributions from local residents. The system is based historically on a system that pre-dates Ujamaa socialism and remains an integral component of law enforcement in most rural contexts. For a more detailed description of the role of *sungusungu* see Abrahams (1987).

Methodology

A set of rapid assessment tools was designed to collect data on sexual behaviour, social characteristics and the environment in the town. Two male and two female Tanzanian fieldworkers resided in the town for a period of 3½ weeks for data collection during February and March 2002. The research supervisor stayed within walking distance of the town to allow close supervision and regular data reviews to guide data collection. All data were collected in Swahili. Research informants were permanent and semi-permanent residents of the whole area, all of whom were interviewed or observed in the central part of the town.

The field team worked in pairs, immersing themselves in town life, visiting local food stalls and bars, hair salons, video shows, discos, church services and beer promotions and buying goods from local traders. Each fieldworker made close ties with at least two key informants who were consulted repeatedly throughout the research. Notes were jotted down in situ and expanded at the first opportunity, then further expanded into full field notes daily.

The fieldworkers used five checklists of questions for interviews. These enabled a stepwise process of data collection leading to a holistic picture of sexual behaviour and social context (Table 1).

Recorded, in-depth interviews were transcribed and translated from Swahili into English. Data were coded and categorised, then analysed using NUD*IST 5 qualitative analysis software (QSR International Pty, Ltd., Melbourne, Australia).

All questions about the nature of the research were answered by the fieldworkers. In-depth interview participants were informed of the purposes of the research, that participation was voluntary and that all data would be anonymised. All informants were able to provide written consent and this was obtained. Each interviewee was given money worth US\$2.50 and a fizzy drink. In deciding on these amounts, the AMREF MHP team balanced the need to provide adequate compensation for time lost with the need to avoid biasing responses. All names were coded for confidentiality. Recorded data were stored in a secure location at the offices of the National Institute for Medical Research, Mwanza and only accessed by the research team.

The fieldwork team developed the typology collectively through an iterative process. This involved adjusting initial findings through further interviews and observation. Data collected by each individual fieldworker were discussed intensively with the rest of the team at least once every 2 days, with other fieldworkers sometimes instructed to pursue the same line of enquiry. This iterative process, common to rapid assessment procedures, contributed to the robustness of the findings but means that it is difficult to attribute

Table 1
Data collection instruments

Checklist #	Content of interview	People interviewed
1	Local officials.	Conditions in the town, e.g. the characteristics of public and private facilities, local economy and demographics.
2	People encountered while visiting local facilities.	Social and demographic information, where they liked to socialise and why, occupations, living arrangements and reasons for migration/residence in the town.
3	Informants approached in locations for socialising identified during the first two stages of research.	Features of sexual behaviour in the town: types of people involved in sexual negotiation as intermediaries, providers and clients, why some people do not use condoms and why some women sell sex.
4	People encountered while visiting previously identified high-risk locations.	Sexual negotiation: how, where, with whom? Data were complemented by observation throughout the fieldwork period.
5	Informants selected from earlier stages of research, on basis of previously established relationship with interviewer, evidence of openness in discussing sexual behaviour and representing a suitable cross-section of 'types' from preliminary categories developed.	Life of the informant before migrating to the area, personal sexual behaviour and partners, risk and sexual behaviour in the town. Characteristics of previous partners (e.g. accommodation, clothes, income-earning activities) were visually represented in sketches.

findings to particular data collection instruments or informants. Such a holistic approach to data collection enables the pursuit of unexpected findings. It also enables high internal validity in findings on behaviours and their social contexts (Lambert, 1998; Manderson & Aaby, 1992; Scrimshaw, Carballo, Ramos, & Blair, 1991).

Criteria used to assess risk included any or all of the following: number and turnover of sex partners, use of condoms for sexual intercourse, accessing or practising commercial sex and/or anal intercourse. Respondents differentiated types of people according to these criteria and added further criteria, such as living arrangements, to distinguish groups. We use the distinctions made by respondents on distinguishing features and behaviours of types of people to situate an understanding of risk in the cultural context of the town.

The construction of the sexual network reported later was not anticipated at the design stage of the project, but was suggested by the fieldworkers and agreed by investigators as a result of information received about relationships between people of particular types. The network is included to highlight the high degree of sexual mixing between types as part of the third objective of the research. The data come from reports of a sexual encounter by one of the partners involved. Fieldworkers frequently heard from informants about the sexual activities of other people. Some sexual encounters took place overtly in public places such as the corners of sheltered drinking areas. The field team made no active

attempts to observe these but saw them as a result of their presence in high-risk locations. Encounters reported by others or observed were cross-checked by asking reported/observed partners, assuring them of anonymity and confidentiality and obtaining their consent.

Results

Exact numbers of informal interviews during participant observation are not known but can be estimated at between 200 and 300 throughout the period of research. Thirty-two individuals participated in social and demographic interviews (Checklist 2), 20 in interviews on main features of sexual behaviour in the town (Checklist 3) and 14 in in-depth interviews about personal sexual behaviour (Checklist 5). Roughly equal proportions of males and females participated in the interviews.

In most cases, types were not mutually exclusive. Thus, classification as one type did not preclude classification as another. For example, a man defined by ethnicity could also be classified by his employment and type of sexual relationship. Movement between types was also common and reflected changes such as residential or employment status.

Female types

Women were most commonly defined through their sexual relationships and behaviour.

Women defined by commercial sexual activity

Women who were said to sell sex openly and to gain their main income from this activity were described by others as *machangudoa* (slang for sex worker or “prostitute”) or *malaya* (the term used throughout Tanzania for professional sex worker). The former term described permanent residents who were continually available and generally considered less desirable than the latter, who were not resident but visited the town regularly. Women perceived to be *machangudoa* were unemployed women who generally lived together in groups, sharing sleeping accommodation. A woman who acknowledged that selling sex was her main source of income would rarely use either term to describe herself. Circular migration reflected miners’ fortnightly paydays, enabling women who are known as *malaya* to exploit their ‘newcomer status’ as more desirable partners.

Women identified as *wasimbe* (single women of reproductive age) were those who had never married or had been previously married. They often ran small businesses such as selling food or groceries. They were said to obtain money for sex mainly from men who worked on the mine. Clients were reportedly able to have sex on credit with *wasimbe*, paying when they received their salaries at the end of the month.

Mabaamed (barmaids) often sold sex as their larger source of income but were distinguished from other women who did so by their enhanced status, as their sex work was less visible. These women had extensive social networks and therefore were central to sexual negotiations in the town.

With the exception of *mabaamed*, these terms were derogatory and rarely used by women to describe themselves. Their lower status derived from the fact that they were not in a steady relationship with a man and ‘had no man to keep an eye on them’. The terms enabled ‘respectable women’ in a relationship with a man to distinguish their own behaviour from that of women who sold sex openly. The way in which women were categorised could change according to their changing relationships with men, and could revert to a CSW category if a relationship broke down. However, women described as *mabaamed* could not also be *machangudoa* even if they also sold sex regularly.

Women defined by their relationship to men

There were four types of women described as being in relationships with men which were not primarily commercial. The scope of the terms ranged from two people having sex more than once to a couple living together on a formal or informal basis. Although these were defined as relationships rather than transactions, sex continued to be exchanged for money or gifts, but more irregularly as the relationship progressed. Women in a relationship might also have had sex with men other than their primary partner, often to supplement their

income, but occasionally for revenge against an unfaithful partner.

A woman became the *mpenzi* (lover, pl. *wapenzi*) of a man when she had had sex with him more than once and it was not simply motivated by material gain. Sex may still have been exchanged for money or gifts, however, and without these the relationship often ended. Increased stability and mutual trust in the relationship altered the status of each partner and women in such situations were defined as *mahawara* (partners/mistresses). *Mahawara* often lived some of the time with their primary partner. The relationship was considered more serious when men paid for the women’s rent and they thus became *vimada* (kept women/concubines). Rather than irregular money or gifts, men paid for the basic needs of ‘their’ *vimada* such as rent, food and clothes. At this stage women’s independence was more restricted as they were supposed to be constantly available to their partner. However, as *vimada* and their primary partners did not live together regularly such women were able to pursue other sexual partners to supplement their primary partners’ financial support. If a couple decided to formalise their relationship, as often occurred on the birth of a child, they may have married, either formally or informally (when brideprice was not paid) and women became *wake*, meaning wives. These ‘marriages’ appeared to be short-lived, often disintegrating on the discovery of sexual infidelity or on the termination of the male partner’s contract at the mine. Formal civil or religious marriages were uncommon.

Women of other types aspired to the status of *kimada* (singular of *vimada*) as it signified that a man was paying attention to their material and sexual desires. Women were somewhat ambivalent about the transition from *vimada* to *wake*, as husbands were said to neglect their wives’ needs and to be unfaithful.

The terms *wapenzi* (lover) and *mahawara* (partner) also applied to men to describe their relationships with women. The term *vimada* applied to women only as men were supposed to support women financially, not vice versa. The term *waume* (husbands) applied to many men who had either an informal or formal wife with or without children, either elsewhere or in the town. Many *waume* that worked on the mine lived alone, having left their family at their place of origin. Most *waume* were known primarily by their income-earning activity, by origin or ethnic group or by other aspects of social behaviour rather than their marital status, as the latter was less important as a marker of identity for men (see below).

Women defined by their youth

Two types of women were defined by others by their youth: *wabichi* (‘unripe girls’) and *wasichana wadogo* (young girls). Both were younger than 18 and were often paid low rates for sex. The former were less visible in their behaviour than the latter, who tended to frequent

local discos and video halls and would often have sex in exchange for beer. *Wabichi* were particularly vulnerable to sexual exploitation: they were considered highly desirable because of their innocence, youth, the low compensation they asked for sex and their inability to negotiate condoms. They were often school students or housegirls (young girls who live and work in other's homes receiving minimal or no salary) and relationships with them were often covert, involving prolonged negotiation or coercion in the form of gifts and pressure.

Women defined by employment or other activity

Several categories of women other than bar workers were defined primarily by their non-sexual work, and this was probably their primary source of income and provided them with legitimate status. However, they also generally sold sex and had sex with multiple partners, as female work in the town was rarely highly remunerative and women supplemented meagre earnings and irregular business with transactional sex. Groups cited were *wafanyabiashara* (informal business-women), *Mama Lishe* (food stall owners, lit. 'Mrs Nutrition'), *wafanyakazi mgodini* (women who work on the mine) and *wafanyakazi nyumbani* (housegirls). Income for *wafanyabiashara* and *Mama Lishe* rose substantially at the middle and end of each month when mineworkers were paid and were able to re-pay credit extended by these women from both sexual and other services such as the provision of food.

Male types

Men were sometimes defined by their relationships to women, as already described. Generally, however, they were described by their employment status, behaviour or origin.

Men defined by their work or employment Status

For women in the town, the primary role of men appeared to be to provide an avenue to an otherwise inaccessible income. Accordingly, mine identity cards were an easy route for males to acquire higher status and number of sexual partners. If income was displayed by buying bottled beers in bars, a man was considered desirable. *Wamgodini* (miners) were desirable sex partners, often aggressively pursued by *machangu doa*, *malaya* and *mabaamed*. They rarely needed to pursue women themselves. *Wafanyabiashara* (formal and informal businessmen) were also sought-after partners. Both were believed to have multiple partners.

Some of the less affluent men were described and described themselves as either *madewaka* (day labourers) or *wasoteaji* (lit. 'struggling ones', i.e., those who are seeking work). The former were found in local bars where they provided a willing market for less expensive *machangu doa* and others at slow periods of the month.

Wasoteaji had unclear potential as partners, as they currently had no access to income but might gain employment in future. Some women were willing to gamble on their potential, offering free services including food and sex in exchange for future recompense. Women most likely to do this were *Mama Lishe* and female *wafanyabiashara* as they had a steady, if minimal, income.

Men defined by their marginal behaviour

Machekbob was a slang term used both in this area and nationally to describe fashion-conscious young men (aged 16–25). They were generally unemployed and poor but their fashionable clothes and hairstyles attracted girls (generally younger than 18) who were often willing to have sex without charging them. As they were generally unable to afford the cost of bottled beer, they congregated outside bars to attract girls who entered and left. They were often drunk and sometimes pressured girls to have sex.

Wahuni (hooligans) were often unemployed and perceived to be uninterested in work. They were reported to spend their time drinking local or bottled beer, negotiating sex for others and smoking *bangi* (marijuana). They were said to force women to have sex as they were unable to pay. Some were known in the area for carrying out a recent series of gang rapes after discos and beer promotions, largely at the request of men who wanted to punish certain women who had taken their money or goods but who had not provided sex in return.

Both *machekbob* and *wahuni* were judgemental terms and were consequently not used by these individuals to refer to themselves. Instead, they were used either by women or other men seeking to claim a higher status.

Men defined by their origin or ethnic group

In the study site, origin or ethnicity was often used as an indicator of social and sexual behaviour. The mine employs nationals of both SSA and Western countries, many of whom live on the mine compound but visit the town on a regular basis. Ethnic terms were in common use by both men and women and especially when the term denoted particular social or sexual behaviour or suitability as a partner and/or wealth provider.

Many *wazungu* ('white men') were thought to visit the town exclusively for sex, particularly anal and oral sex. They were noted for multiple and often concurrent partners and a dislike of condoms. They were desired by women because of the wealth and status associated with them. However, once women were abandoned by *wazungu* they were often treated as pariahs by African men who saw them as polluted by 'abnormal' sexual practices and their value was often reduced. Many town residents blamed the *wazungu* for introducing anal sex. However, people who had lived in the town prior to the

establishment of the new mine reported that anal sex was practised prior to *wazungu's* presence and was associated with *machangudoa* and *malaya*, who were reported to have introduced the practice to increase their earning during the period of small-scale artisanal mining.

Wasouth (South African black men) were also distinguished by their perceived preference for multiple, concurrent partners, high income and enjoyment of sex and women. They were thought to consume high levels of alcohol and to dislike condoms. In contrast the *Waghana* (Ghanaian men), a small number of whom worked in the mining industry, were noted for their high levels of discipline and low level of alcohol consumption. They reputedly rarely became involved in town sexual life. The *Waafrika* (African men) defined all other types of black, African men who worked on the mine, regardless of origin. Their social and sexual behaviour was disparate but was frequently conceptually opposed to *Wazungu* and *Wasouth*. This is slightly misleading, as is their representation of 'normal' behaviour, i.e. a preference for vaginal sex and respect for women. In fact, the group encompassed a wide spectrum of social and sexual behaviour types in the town.

Social origin was also used amongst town residents to differentiate types. *Mamami* (petty traders from rural areas) and *wanakijiji* (long-term residents of the town) were generally despised by women as representing lower economic status and traditional, rural life. The former came from surrounding areas to sell their produce. They commonly spent some of their money on local beer and women before returning to their home villages. As a result they were likely to be an important source of spread of infection to their wives and other sex partners in more remote villages. They were often ignorant of HIV/AIDS and were thought to have unprotected sex with women who were believed by others to have HIV. They often had sex with cheaper *machangudoa* selling sex from local bars. *Wanakijiji* were often married and lived with their families but may have pursued other partners if the economic opportunity arose.

Sexual relationships between groups

The sexual network presented in Fig. 1 is one example of the complexity of sexual mixing and highlights the importance of looking beyond conventional high-risk categories. The diagram presents 24 sexual encounters that were reported to or observed by fieldworkers during the 3½-week fieldwork period and seven encounters that were reported to have occurred outside this period. It can be considered as partial, and an underestimate of the actual extent of one sexual network since it is likely that sexual encounters were under-reported or missed during observation. Fig. 2 presents the frequency of sexual

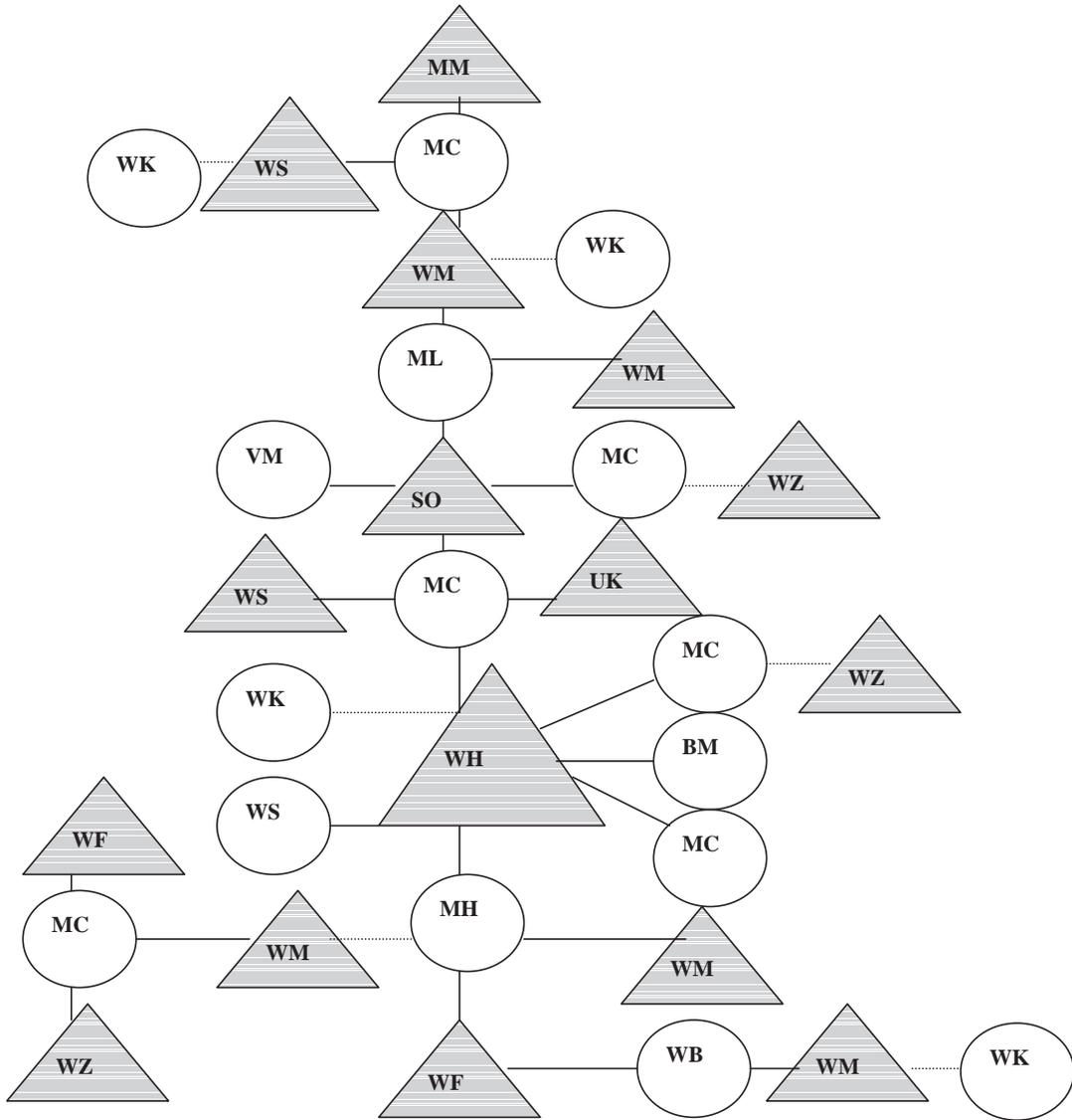
partners by type within this particular limited network. Of the 16 types represented, nine had more than one partner on average. Types with an average of more than two partners were *machangudoa*, *malaya*, *hawara*, *wahuni* and *wasouth*. *Wake* were exposed to risk through the behaviour of their primary partner.

Discussion

Population mobility is a major contributor to the HIV/AIDS epidemic as it increases the number of sexual partnerships as well as contacts with high-risk groups such as sex workers. Loneliness, insecurity and freedom from social norms provide an impetus to risky sexual behaviour; this is compounded by economic hardship that may impel individuals to trade sex for money or favours. Mobile populations may themselves be considered as "core" or as "bridging populations" (Cates & Dallabetta, 1999), transmitting HIV/STI to lower-risk groups in countries/regions of origin as well as destination. Partners left behind may also engage in higher-risk behaviour for emotional or financial support (UNAIDS & International Organisation for Migration, 1998, 2001).

Migration was a central feature of life in this mining town. Most of the miners were from other parts of Tanzania or other countries, and rarely brought regular partners to live with them in the town or at the mine site. The recent establishment of large-scale commercial mining had brought a rapid influx of other migrants, some in search of employment on the mine and others seeking to benefit economically from those employed there and from the expansion in economic activity in the town. Women viewed the granting of sexual favours as a vital means of economic advancement. For men, sexual freedom appeared to be one of the attractions of the town or a compensation for separation from home. With a highly mobile population in aggregate, this town may be considered a high-risk environment, or even a "core environment" with little differentiation in levels of risk between groups within it. People working here might be considered as "bridging populations" when they return from the town to regions and countries of lower HIV prevalence. But within the town itself, the concepts of "core", "bridging" and "general" populations do not capture the complexity of sexual mixing patterns.

This suggests the need for an environmental and geographical approach to sexual risk rather than attributing risk to individuals. In this case, the poverty of surrounding areas of Tanzania contrasted sharply with the potential income-earning and social advancement opportunities of the mine, leading to an environment of high numbers and turnover of sexual partnerships.



^a The triangle used to represent wahuni is larger to represent the group responsible for gang rapes

Female		Male	
BM	Mabarmaid	WM	Wamgodini
MC	Machangudoa	WF	Wafanyakazi
ML	Malaya	WS	Wasoteaji
WB	Wabichi	MM	Mamami
WS	Wasichana wadogo	WZ	Wazungu
MH	MaHawara	SO	Wasouth
VM	Vimada	WH	Wahuni ^a
WK	Wake	UK	Unknown
Sexual episode occurred during 3½ week fieldwork period			
Sexual episode occurred outside 3½ week fieldwork period			

Fig. 1. Sexual networking between types.

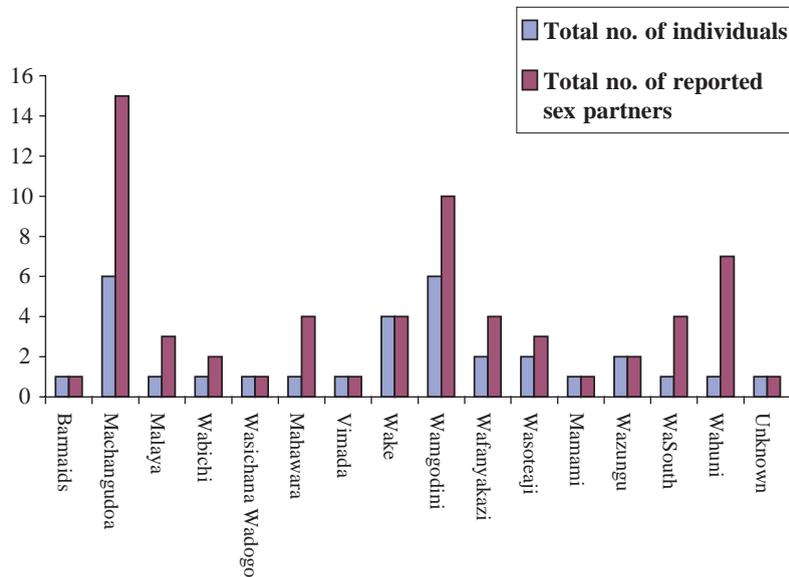


Fig. 2. Frequency of sexual encounters of types in the sexual network.

Our study did not include collection of information on sexual practices prior to migration. However, it seems that the significant differences in HIV prevalence between FRFWs, other women, male miners and other men found in the seroprevalence survey at the establishment of the mine in 2000 may result from sexual practices before migrating to the town. Our findings suggest that these differences may lessen because risk practices are so pervasive, but that the average prevalence of HIV will increase.

The pervasiveness of high-risk behaviour suggests a need for approaches that address the needs of the broad spectrum of types identified by the research. In this regard, there is a need to provide general HIV/STI education to all sectors of the community. We found high levels of knowledge that HIV/AIDS could be transmitted through vaginal sex and that condoms could offer protection, but there was also some evidence of misguided views, e.g. that anal sex was somehow protective, suggesting a need for health education on specific issues. However, it is clear that the HIV/STI prevention needs of residents of the town go beyond health education for the “general population”. We found some core issues and values that should be addressed.

With its profusion of bars and other facilities, recreation was shown to be central to life in this town. Immigrant informants associated recreation here with greater modernity, personal opportunity, affluence and freedom than they had experienced in their places of origin. The importance of “modern” values was reflected in the negative attitudes towards *mamami* and *wanakijiji* who were associated with rural life, poverty and ignorance and in the preference for brand-name clothes (whether fake or not) among the *mackekbob*, the

fashion-conscious male youth. This suggests that, to appeal to the people of the town, health promotion strategies should be used which appear modern and fashionable, such as video shows, music and popular theatre. Condoms could be marketed as a modern way to maintain sex appeal via protection from STI.

The town was clearly associated in the minds of informants with opportunity and affluence, and this cannot be divorced from the situation of rural poverty of most of the surrounding areas. A long-term strategy for addressing risk must be to create sustainable earning opportunities in rural areas and to decrease income inequalities. However, research elsewhere in Tanzania has shown that material exchange for sex is very common and is not necessarily dependent on poverty. Many young women in rural areas were found to accept a sexual relationship with the expectation of material benefit, but these relationships were rarely perceived as commercial or unacceptable. Gifts and money in exchange for sex were sometimes interpreted as signs of esteem, respect and love (Wight et al., submitted). In these circumstances, income-generation schemes seem unlikely to reduce risk substantially by themselves, though this hypothesis remains to be tested in the Tanzanian context.

Since this research was conducted, the company owning the mine has established a low-cost housing scheme for employees, enabling some to live with family members. For some this may result in reduced risk of HIV/STI transmission arising from the proximity of regular sexual partners. However, early indications are that new “hotspots” such as bars are emerging to meet the market potential of the new social housing areas. The structural problem of the relative poverty of

surrounding areas is only partially addressed by this initiative.

The risks at the collective level are nuanced by risks associated with particular types of people as identified by the research. While the research did not show clear distinctions between high- and low-risk types, it clearly showed social environments and situations associated with risky behaviour and where interventions could take place. For instance, interventions for *wasichana wadogo* (young girls), *machekbob* (fashion-conscious young men) and *wahuni* (hooligans) could be organised around discos, beer promotions and video evenings. *Machangudoa* (“prostitutes”) were distinguished by their living and employment situations as well as their sexual behaviour. They may be reached by targeting unemployed women sharing accommodation. *Wazungu* (white men) may be reached by interventions targeting technical advisors at the mine. An advantage of focussing on social situations and environments is that this avoids the potential stigmatising damage done by publicly using the terms applied to types, some of which were derogatory. Understanding of the local meanings of the categories can help distinguish the more from the less derogatory terms, while still enabling interventions to be more effectively targeted.

Terms commonly used in epidemiology, such as “youth” and “commercial sex worker” are often used as the basis of peer education or peer worker interventions (Milburn, 1995; Wolf & Tawfik, 2000). It is not clear that the types identified in this research can be used in the same way. The research showed not only that some terms were derogatory and not accepted by the people to whom they were applied, but also that there was some competition and rivalry within types, notably when pursuing sexual partners. It is possible that these issues also arise within commonly used epidemiological categories, which highlights the utility of ethnographic approaches in identifying potential difficulties of programmes which are not sensitive to difference.

Comprehension of community norms enables the identification of likely opinion leaders who can influence change among other types as well as their own (Bennett & Murphy, 1997). In this town, African mineworkers were held in high esteem and it appears likely that health promotion messages targeted towards them, if successful, will have beneficial ripple effects across the town. The “opinion-leader” concept is difficult to apply to women alone in this context as types of women appeared to be divided by their competition for male attention. In this male-dominated society, the most viable opinion leaders are likely to be men.

A weakness this study has in common with others based on rapid assessment procedures is that it made extensive use of information provided by key informants and on opinions and views about other people as well as by the subjects in question. Further, longer-term research would be necessary to establish the validity of sexual

behaviour reports, the extent to which definitions of each type are shared across types, how stable each definition is, the extent to which people move between types and how far group-identity is ascribed and how much acknowledged. This may lead to refinements and shifts in the typology. Interventions should be developed via further consultations with people of each type and in response to behaviours, social conditions and expressed needs that may not have been identified during this rapid assessment.

The rapid assessment procedures used here enabled the development of a typology of groups at risk of HIV based on local cultural categories, which extend beyond the groups conventionally thought to be at highest risk in similar SSA locales, i.e. women working exclusively as CSW, female bar workers and male mineworkers. It was found that high-risk behaviour was common across types, to the extent that it is difficult to distinguish risk levels between types. We conclude it is useful to think of risk environments rather than attributing risk to types of people. The town as a whole is a high-risk environment, combining rapid income-earning opportunities in a context of rural poverty with a predominance of migrants in the local population. High-risk behaviour by the types identified in the research was associated with the environments and situations in which they lived and operated, e.g. employment status, living arrangements and venues for recreation. The methodology enabled an approach to interventions that was sensitive to difference within the town while also identifying structural factors affecting risk at the level of the town as a whole.

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References

- Abrahams, R. (1987). Sungusungu: village vigilante groups in Tanzania. *African Affairs*, 87(343), 179–196.
- Barongo, L. R., Borgdorff, M. W., Mosha, F. F., Nicoll, A., Grosskurth, H., Senkoro, K. P., Newell, J. N., Changa-lucha, J., Klokke, A. H., & Killewoet, J. Z. (1992). The epidemiology of HIV-1 infection in urban areas, roadside settlements and rural villages in Mwanza Region, Tanzania. *AIDS*, 6(12), 1521–1528.
- Bellaby, P. (1990). To risk or not to risk? Uses and limitations of Mary Douglas on risk acceptability for understanding health and safety at work and road accidents. *Sociological Review*, 38, 465–483.
- Bennett, P., & Murphy, S. (1997). *Psychology and health promotion*. Buckingham: Open University Press.
- Campbell, C. (1997). Migrancy, masculine identities and AIDS: the psychosocial context of HIV transmission on the South African gold mines. *Social Science & Medicine*, 45(2), 273–281.
- Campbell, C., & Williams, B. (1999). Beyond the biomedical and behavioural: towards an integrated approach to HIV prevention in the South African mining industry. *Social Science & Medicine*, 48, 1625–1639.
- Cates, W., & Dallabetta, G. (1999). The staying power of sexually transmitted diseases. *The Lancet*, 354(s4), 2.
- Chirwa, W. C. (1997). Migrant labour, sexual networking and multi-partnered sex in Malawi. *Health Transition Review*, 7(Suppl. 3), 5–15.
- Clift, S., Anemona, A., Watson-Jones, D., Kanga, Z., Ndeki, L., Changalucha, J., Gavyole, A., & Ross, D. A. (2003). Variations of HIV and STI prevalence within communities neighbouring new goldmines in Tanzania: importance for intervention design. *Sexually Transmitted Infections*, 79, 307–312.
- Gysels, M., Pool, R., Kabunga, E., & Bwanika, K. (2001). Truck drivers, middlemen and commercial sex workers: AIDS and the mediation of sex in South West Uganda. *AIDS Care*, 13(3), 373–385.
- Haour-Knipe, M., Leshabari, M., & Lwihula, G. (1999). Interventions for workers away from their families. In Gibney, L., Di Clemente, R., & Vermund, S. (Eds.), *Preventing HIV in developing countries: biomedical and behavioural approaches* (pp. 257–282). New York: Plenum Press.
- Kishindo, P. (1995). Sexual behaviour in the face of risk: the case of bar girls in Malawi's major cities. *Health Transition Review*, 7(Suppl.), 153–160.
- Lambert, H. (1998). Methods and meanings in anthropological, epidemiological and clinical encounters: the case of sexually transmitted disease and human immunodeficiency virus control and prevention in India. *Tropical Medicine and International Health*, 3(12), 1002–1010.
- Manderson, L., & Aaby, P. (1992). An epidemic in the field? Rapid assessment procedures and health research. *Social Science & Medicine*, 35(7), 839–850.
- Meekers, D. (1994). Sexual initiation and premarital childbearing in sub-Saharan Africa. *Population Studies*, 48(1), 47–64.
- Mgalla, Z., & Pool, R. (1997). Sexual relationships, condom use and risk perception among female bar workers in north-west Tanzania. *AIDS Care*, 9, 407–416.
- Mhalu, F., Hirji, K., & Ijumba, P. (1991). A cross-sectional study of a program for HIV infection among public house workers. *Journal of Acquired Immune Deficiency Syndrome and Human Retrovirology*, 4, 290–296.
- Milburn, K. (1995). A critical review of peer education with young people with special reference to sexual health. *Health Education Research: Theory and Practice*, 10(4).
- Mnyika, K. S., Klepp, K.-I., Kvale, G., Nilssen, S., Kissila, P. E., & Ole-King'ori, N. (1994). Prevalence of HIV-1 infection in urban, semi-urban and rural areas in Arusha region, Tanzania. *AIDS*, 8, 1477–1481.
- Mosha, F. (1995). *Artisanal mining report*. Unpublished Report. London: London School of Hygiene and Tropical Health.
- Obbo, C. (1993). HIV transmission through social and geographic networks in Uganda. *Social Science & Medicine*, 36(7), 949–955.
- Parker, R. G. (1996). Empowerment, community mobilization and social change in the face of HIV/AIDS. *AIDS*, 10(Suppl. 3), S27–S31.
- Scrimshaw, S. C. M., Carballo, M., Ramos, L., & Blair, B. A. (1991). The AIDS rapid anthropological assessment procedures: a tool for health education planning and evaluation. *Health Education Quarterly*, 18(1), 111–123.
- UNAIDS (2002). *Global estimates of HIV/AIDS epidemic as of end 2001*. Geneva: UNAIDS.
- UNAIDS and International Organisation for Migration (1998). Migration and AIDS. *International Migration Quarterly Review*, 36(4), 443–468.
- UNAIDS and International Organisation for Migration (2001). *Population mobility and AIDS*. Geneva: UNAIDS.
- Wight, D., Plummer, M., Mshana, G., Wamoyi, J., Salamba, Z., & Ross D. (submitted). Contradictory sexual norms and expectations for young people in rural northern Tanzania. *Africa*, submitted for publication.
- Williams, B. (1999). *Factors influencing HIV-transmission in a gold mining community: results of the Mothuisimpilo baseline survey*. Johannesburg: Council for Scientific and Industrial Research.
- Williams, B., MacPhail, G. C., Campbell, C., Taljaard, D., Gouws, E., Moema, S., Mzaidume, Z., & Rasego, B. (2000). The Carletonville–Mothuisimpilo Project: limiting transmission of HIV through community-based interventions. *South African Journal of Science*, 96, 351–359.
- Wolf, R., & Tawfik, C. L. A. (2000). Peer promotion programs and social networks in Ghana: methods for monitoring and evaluating AIDS prevention and reproductive health programs among adolescents and young adults. *Journal of Health Communication*, 5(Suppl.), 61–80.