

HIV and AIDS among fisherfolk: a threat to ‘responsible fisheries’?

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Abstract

Fishing communities are often among the highest-risk groups in countries with high overall rates of HIV/AIDS prevalence. Vulnerability to HIV/AIDS stems from complex, interacting causes that may include the mobility of many fisherfolk, the time fishermen spend away from home, their access to daily cash income in an overall context of poverty and vulnerability, their demographic profile, the ready availability of commercial sex in fishing ports and the subcultures of risk taking and hypermasculinity among some fishermen. The subordinate economic and social position of women in many fishing communities in low-income countries makes them even more vulnerable. HIV/AIDS in fishing communities was first dealt with as a public health issue, and most projects were conducted by health sector agencies and NGOs, focusing on education and health care provision. More recently, as the social and economic impacts of the epidemic have become evident, wider social service provision and economic support have been added. In the last 3 years, many major fishery development programmes in Africa, South/South-East Asia and the Asia-Pacific region have incorporated HIV/AIDS awareness in their planning. The HIV/AIDS pandemic threatens the sustainability of fisheries by eclipsing the futures of many fisherfolk. The burden of illness puts additional stresses on households, preventing them from accumulating assets derived from fishing income. Premature death robs fishing communities of the knowledge gained by experience and reduces incentives for longer-term and inter-generational stewardship of resources. Recent projects championing local knowledge and resource-user participation in management need to take these realities into account. If the fishing communities of developing countries that account for 95% of the world’s fisherfolk and supply more than half the world’s fish are adversely impacted by HIV/AIDS, then the global supply of fish, particularly to lower-income consumers, may be jeopardized.

Keywords fisheries development, fishing communities, gender, HIV/AIDS mitigation, HIV/AIDS prevention, masculinity, poverty, vulnerability

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| | |
|---|------------|
| Introduction | 216 |
| The HIV/AIDS epidemic and its development impacts | 216 |
| An HIV/AIDS alert for the fisheries sector | 217 |
| The HIV/AIDS pandemic and fishing communities | 218 |
| Why are HIV prevalence rates apparently so high in some fishing communities? | 220 |

| | |
|--|------------|
| Likely modes of infection among fisherfolk | 220 |
| Mobility as a factor associated with high HIV prevalence | 220 |
| Cash incomes and poverty traps | 221 |
| Fishing, drinking, and sex | 221 |
| Gender inequality and risky 'transactional sex' | 222 |
| A subculture of risk? | 223 |
| A caution against stereotyping and blaming | 223 |
| The implications of high HIV rates for fisheries management and development | 224 |
| Individual and household-level impacts | 224 |
| Impacts at community or enterprise and sectoral levels | 225 |
| What is being done to address HIV/AIDS in fishing communities? | 228 |
| The future: planning, mitigation and research | 229 |
| Conclusions | 230 |
| Acknowledgements | 230 |
| References | 230 |

Introduction

You would not find HIV/AIDS mentioned in any fisheries management textbook or technical manual. And yet from the time that HIV/AIDS was first described from a Ugandan fishing village on the shores of Lake Victoria in 1982 (Serwadda *et al.* 1985) it has repeatedly been stated that fishing communities are among the most vulnerable occupational groups, particularly in the South-East (SE) Asian and African countries where the epidemic has hit hardest (Bain 1998; Hemrich and Topouzis 2000). It is also in these areas that the vast majority of the world's 100 million fisheries-dependent people live and work (Garcia and de Leiva Moreno 2003). Although health professionals and community development NGOs have been well aware of the status of fishing communities as high-risk groups for nearly 20 years, those involved in fisheries management and development have, until the last 4 years, seldom considered the implications of HIV/AIDS for the sustainability of fisheries. This paper argues that the implications of HIV/AIDS are profound and need to be taken into account by anyone involved in advising on fisheries management at a global scale, or in promoting fisheries development in the low-income countries where HIV/AIDS is prevalent. This review intends to draw the attention of fishery analysts and managers to the extent of the HIV/AIDS problem and outline the likely implications of the epidemic for our attempts

to manage fisheries 'responsibly' (FAO 1995) and to promote development and eradicate poverty in fishing communities.

The HIV/AIDS epidemic and its development impacts

At the end of 2003, 40 million people worldwide were living with HIV/AIDS, 90% of them were in developing countries and 75% in Sub-Saharan Africa. In 2003 there were 3 million AIDS-related deaths, 1.2 million of these deaths were women, 500 000 were children (UNAIDS/WHO 2003). Sub-Saharan Africa is frequently viewed as the 'hot spot' of the epidemic, but the impact of the epidemic is global and cross-sectoral. Significant epidemics are occurring in SE Asia, the Indian Subcontinent, Latin America, North America and the Caribbean and Eastern and Central Europe. The importance of addressing the impact on development of HIV/AIDS has been highlighted in the Millennium Development Goals where part of Target 6 is to 'have halted by 2015 and begun to reverse the spread of HIV/AIDS' (UN 2003).

In the most affected areas, HIV/AIDS is having severe negative impacts on food production systems, the national economy and the structure of society (Barnett and Whiteside 2002). In Africa, HIV/AIDS transmission takes place almost exclusively through heterosexual activity, or through subsequent mother to child transmission, either *in utero* or

through breast-feeding (Buvé *et al.* 2002). Thus the epidemic has had a profound effect on the so-called 'sexually active' population, aged 15–50 years, and on young children. The effects of the epidemic on population structure were first apparent in Uganda in the late 1980s (Barnett *et al.* 1990) and were instrumental in spurring the Ugandan Government's firm political commitment to reversing the spread of HIV. Uganda's national¹ HIV prevalence rate declined from 21.1 to 9.7% between 1991–98 against a trend of globally increasing prevalence rates (Low-Beer and Stoneburner 2003). Elsewhere, life expectancy in some Southern African countries is expected to have halved from 60 in the 1980s to 30 by 2010 if present infection rates continue (Buvé *et al.* 2002). Population growth in Botswana is now negative and several other countries in the region have sharply reduced rates of growth, including Lesotho, Malawi, Namibia, South Africa, Swaziland and Zimbabwe (UNAIDS/WHO 2003).

Although increased cost of health care provision is the most obvious burden of HIV/AIDS on national economies, loss of labour has also been highlighted as one of main economic impacts (Gillespie 1989; Lisk 2002). In Kenya, for example, FAO (2002) reports government figures predicting that the total number of lost workdays in the agricultural sector because of HIV/AIDS will reach 329 000 person-years in 2020, if present trends continue. Labour is not only lost from agriculture and business, it is also lost because of care or shifting time and energy to other tasks (like childcare) because of the loss of the person who previously performed such reproductive roles². The recent food shortages in Southern Africa may have been exacerbated by the HIV/AIDS epidemic, which has weakened the agricultural sector's ability to respond to market and environmental uncertainties (Barnett and Whiteside 2002; De Waal and Whiteside 2003).

The HIV infection rates are rising faster in women relative to men and this has focused attention on the special risk of infection caused by many women and girls' lack of power and influence in sexual relations

(Richardson 1987; Baylies and Bujra 2000; Farmer 2001). Attention is also being increasingly drawn to men's vulnerability, not only in the context of homosexual relationships but more broadly to look at how cultural beliefs and expectations heighten men's vulnerability, including expectations about the number of sexual partners and types of sexual practices (Bujra 2000; Scalway 2001).

The profound impact that the HIV/AIDS epidemic is having on populations throughout the world will be felt for years to come. While antiretroviral therapy (ART) can prolong the lives of people living with HIV/AIDS, currently only 400 000 infected people in developing countries have access to these treatments (WHO 2003). Even when the drugs are available many people cannot be reached because communications are poor and public health systems are overstretched, poorly resourced and under staffed. In addition, mobile populations, including many fisherfolk, are notoriously difficult to reach with health interventions that require repeat visits. Mitigation of current and future impacts is therefore an important component of policy responses to HIV/AIDS.

An HIV/AIDS alert for the fisheries sector

Although the social and economic effects of HIV/AIDS are now well recognized in other sectors of the production economy and strategies for mitigating the impacts of the epidemic are being developed, the implications of HIV/AIDS for fisheries have been much slower in coming to the attention of fishery analysts. A recent global FAO study on human demography and coastal fisheries (Tietze *et al.* 2000) makes no mention of the impact of HIV/AIDS on fishing populations, despite having conducted detailed demographic research in some countries where fishing communities are thought to have high HIV prevalence rates, like Tanzania, Thailand and Senegal. In a recent global study on health and safety issues in fisheries, commissioned by the International Labour Organisation (ILO 2000a), there is no mention of the risk factors that lead to apparently high HIV infection rates in many fishing communities, nor of the health and safety effects of being infected. Presumably, this was because HIV/AIDS was not considered a 'work-related' health and safety issue for fishermen, in the way it is for commercial sex-workers, for example. Recent reviews urging a more people-centred and holistic way of looking at management and poverty

¹Given conflict in the north of Uganda 'national' figures have been extrapolated from sentinel sites based in other parts of the country. While a decline in prevalence has been observed, the fall may have been from 15%, rather than 21.1% (Tim Allen, personal communication).

²The term 'reproductive role' refers to the social reproduction of the household through, for example, childcare activities.

issues in small-scale fisheries (Allison and Ellis 2001; Béné 2003) similarly fail to mention HIV/AIDS as part of the 'vulnerability context' of households engaged in fishing. However, during the same period that the above cited review studies were being published, some government fishery agencies and NGOs engaged in working in fishing communities were beginning to recognize the extent of the problem faced and were taking action (see the section 'What is being done to address HIV/AIDS in fishing communities?'). One of the aims of this review is to highlight these efforts and bring them to wider public attention.

In this paper, we draw together the existing data on HIV/AIDS prevalence in fishing communities from around the world and review explanations for the observed or presumed high prevalence of HIV in these communities. We outline some of the key implications of the epidemic on fishing households and the future of fishing communities, as well as the likely impacts on fishery production, fisheries management and development planning. Finally, we address what is being done to combat HIV/AIDS in communities engaged in fishing and propose priorities for what remains to be done. This review necessarily draws on much 'grey' literature produced by development agencies, as very little has been published in the academic literature to date in this area. HIV/AIDS data and analytical reports are usually needed urgently and the worldwide web plays a prominent role in disseminating data and analysis so that it can be acted on expeditiously. For this reason, we make more use of the web for bibliographic sources than might be usual in this journal.

The HIV/AIDS pandemic and fishing communities

There are "many glancing references in the media, conference abstracts and elsewhere to high rates of HIV infection in fishing communities in east Africa...but few published studies of sexual behaviour or HIV seroprevalence in these communities" (Pickering *et al.* 1997a, p. 13). The same is true of other areas (Table 1), with the most reliable data on seroprevalence coming from recent studies in Thailand and Cambodia, where the large populations of migrant deep-sea fisherfolk have come to the attention of policy makers, largely through their status as illegal immigrants. Prevalence rates of 15–20% among fishermen in the region mark them out as a very high-risk group, comparable to other 'sentinel'

groups such as commercial sex-workers, military recruits and long-distance truck drivers. As a comparison, the SE Asian regional rate for sexually active adults in the general population is 0.6% (UNAIDS/WHO 2002), but there is variation from country to country with an estimated adult prevalence rate in Cambodia of 2.6% and Laos <0.1% (the latter may partly be a reflection of lack of data).

In Africa, most studies on HIV/AIDS in fishing communities have clustered around Lake Victoria, from where the epidemic was first identified. There are no available data on seroprevalence among people engaged in fishing-related activities (most of whom are small-scale fisherfolk making day or overnight trips onto the lake), but studies of high-risk sexual behaviour in fishing communities and the experiences of medical research and health service projects in the area add up to suggest that fisherfolk are significantly more at risk from HIV/AIDS than other occupational groups, such as the small-scale farmers that make up the majority of the rural population.

Anecdotal evidence based on interviews with health workers in the region puts seroprevalence as high as 70% in lakeshore towns like Homa Bay, Kenya (Seemungal 2003). HIV/AIDS is identified as the leading cause of death in adults aged between 15 and 50 in lakeshore areas in Uganda (MAAIF 2002), while in Kagera region, Tanzania, fisherfolk are said to be five times more likely to die of AIDS-related illnesses than farmers (Ainsworth and Semai 2000). National seroprevalence rates in the countries bordering Lake Victoria region are already high, being between 10 and 15% of the 15–50 age group through the 1990s (Sahn and Stifel 2003). In this context, the relative estimates for fishing communities are devastating.

Although data are sparse, particularly for the major fisheries of South Asia and for Latin America and Eastern Europe, the studies reported in Table 1 provide evidence to make the case that both deep-sea fishermen and coastal and inland small-scale fisherfolk appear to have exceptionally high rates of HIV seroprevalence compared to the general population. These high rates and the high incidence of deaths in fishing communities from AIDS-related diseases have begun to come to the notice of fisheries analysts around the world. The ICLARM/World Fish Center 'Women in Fisheries' Symposium, held in 2001 (Williams *et al.* 2002) was a key event in raising global consciousness about HIV/AIDS in fishing communities. Since then, HIV/AIDS

Table 1 Studies of HIV seroprevalence or incidence of HIV/AIDS in communities where fishing is a prominent economic activity^{1,2}.

| Area/fishery/sample community | HIV seroprevalence or comment on incidence of AIDS | Source |
|--|--|--|
| Thai, Khmer and Burmese fishermen working for Thai fishing companies in the Gulf of Thailand and Andaman Sea Fishermen based at Sihanoukville, Cambodia, Gulf of Thailand | 15.5% of a sample of 818 were HIV-1 positive, with highest rates for Khmer (20.2%) and Burmese (16.1%) crew members. These rates are higher than for other 'sentinel' groups in Thailand: military recruits, truck drivers, male STD patients and some categories of commercial sex-workers. 17% of fishermen who claimed to regularly use condoms were HIV-1 positive; 20% of irregular condom-users were HIV+ (n = 446); 40% of brothel-based sex-workers were HIV positive; 68% of the sampled fishermen had visited a commercial sex-worker within the previous year. Fishermen make up 7.8% of people living with HIV/AIDS in Malaysia, but <2% of the sexually active population, suggestive of higher than average seroprevalence. ³ | Entz <i>et al.</i> 2000 Kim <i>et al.</i> not dated |
| Malaysian fishermen | HIV/AIDS is spreading rapidly as male partners (and some women) have multiple sexual partners, including commercial sex workers. Lack of condom use, prevalence of sexual violence and absence of the moral influence of the older generation are all identified as co-factors making this migrant fishing community particularly vulnerable | Huang 2002 Paul <i>et al.</i> 2003. |
| Migrant Burmese Women in Ranong fishing community, Thailand | Very high rates of sexual mixing within fishing village, but relatively little sexual contact with other communities (e.g. the nearby trading centre with 40% HIV+ among sexually active adults). 'Fishermen were very reluctant to use condoms. They nearly all believed that they were HIV+ and saw no point in protecting themselves or others.' | Pickering <i>et al.</i> 1997a, p. 18. |
| A small fishing village on Lake Victoria, Uganda, comprising 100 households, mid 1990s. | Fishermen are up to five times more likely to die of AIDS than farmers in the same region | Ainsworth and Semai 2000 |
| Fishermen in Lake Victoria, Kagera Region, Tanzania, 1990s | Demographic characteristics, migration, cash incomes and subordinate role of women were all identified as factors making fishing communities especially vulnerable to HIV/AIDS. HIV/AIDS is the leading cause of death among people of 15-50-years old. | MAAIF, Uganda, 2002 |
| Fishing communities in Uganda, 2002 | One-third of respondents had neighbours or relatives living with AIDS and more than 73% felt it a very real threat ⁴ . | Simon-Meyer 2002 |
| Sample of employees (sea going and other) of a major deep-sea fisheries company, Cape Town, South Africa, 1990s | | |

¹The cases from Asia are all from commercial fishing boats (trawlers, seiners or longliners operating on shelf-seas and crewed by 6-18 people), where fishermen are away at sea for days or weeks on end. The cases from East Africa are all from small-boat fisheries (2-6 crew) in inland waters, where fishermen are working overnight and fishing communities are a mix of resident farmer-fishers and migrant fisherfolk. The case from South Africa refers to fishworkers in the large-scale industrial sector.

²We have included only cases where we are confident that the references to high rates of HIV/AIDS among fishing people are based on repeated empirical observation or formal survey. There are many other 'glancing references', unsupported by data, that are suggestive of unusually high HIV prevalence in fisherfolk in other parts of Sub-Saharan Africa, in coastal Pakistan, Indonesia, Vietnam, the South Pacific Islands and Brazil. Some of these anecdotal accounts are referenced in the text, but we acknowledge that there are no reliable data for areas known to be severely affected by the HIV/AIDS epidemic such as the Caribbean, Central America and Eastern Europe, or from the three Asian countries that between them account for 67% of the world's fisherfolk: China, Indonesia and India.

³Other sources quote a figure of 6% of known HIV+ people in Malaysia being fisherfolk (Asian Business Coalition, AIDS impact site: <http://www.abconatids.org>), third only to the unemployed (20%) and factory workers (7%), both of which will be drawn from much larger subpopulations. There are more HIV+ fisherfolk than there are HIV+ long distance drivers (3%), 'housewives' (2%), private sector staff (1%), sex workers (1%) and 'uniformed bodies' (1%). The reliability of the figures is questionable as 60% of known HIV+ cases among adults are of unknown occupation.

⁴Fishers make up a very small percentage of people in Cape Town, so neighbours and relatives may not be fishers; nevertheless fisherfolk are also members of wider communities, such as city neighbourhoods, and this survey provides a contrast to Pickering *et al.*'s study of a socially isolated fishing community. While there is no evidence that the fishworkers in this survey have higher levels of HIV/AIDS than the people they live amongst, the level of their concern suggests significant impacts within their occupational as well as kinship and geographical communities.

has become an issue on the agenda in local and regional fisheries development projects (see section What is being done to address HIV/AIDS in fishing communities?), if not yet part of the mainstream discussion on global fisheries sustainability and 'responsible fisheries'.

Why are HIV prevalence rates apparently so high in some fishing communities?

"Vulnerability of fisheries livelihoods systems to HIV/AIDS ... stems from the socioeconomic dynamics of the fisheries trade and lifestyle, and in particular the fishermen's high mobility, their long absences from home and their cash incomes which are then often spent in the trading centres on casual sex and alcohol. Vulnerability extends to their (fishermen's) casual or semi-casual sexual partners and to their wives at home."

(Hemrich and Topouzis 2000, p. 90).

The above quote (about Malawi, Tanzania and Uganda) introduces some of the key proximate causes of high rates of HIV/AIDS infection that are thought to apply to some fishing communities: mobility and absence from home, cash income and a masculine subculture that encourages hard-drinking and casual sexual encounters. Although such references to fisherfolk's behaviour are common in both the literature and in the discourses of fishery officials, it cannot be assumed that all fishermen are characterized by these patterns of behaviour. It may be assumed that fishers in small, stable communities making day trips to nearby localities and returning home each evening face different risks from fishers who travel long distances and may be away from home for days or even months. It is too simple, however, to divide fisherfolk into, on the one hand, low-risk, home-dwellers making day trips from a stable family and community and, on the other hand, high-risk, nomadic, deep-sea men. Most small-scale fisheries in developing countries consist of mixtures of migrants of varying duration and resident farmer-fishers (Allison and Ellis 2001; Allison 2004). The demography of fishing communities also differs markedly between continents and types of fishery, with developing-country fishers more likely to be young, and away from home than, for example, developed-country inshore fisherfolk who tend to be older and closely tied to their home community (Tietze *et al.* 2000; Symes and Phillipson 2001).

Cultural attitudes to sexual promiscuity will also vary greatly at the individual and community level. We can unravel here only some of the complexity of factors that make many fishing communities vulnerable to HIV infection and we thus refrain from trying to extrapolate from the few available estimates to gauge the number of seropositive fisherfolk globally.

Likely modes of infection among fisherfolk

The increasing concern for the high infection rates in women in fishing communities (Huang 2002) and the lifestyle factors mentioned above suggest that heterosexual transmission prevails as a route of infection with HIV. Other routes of transmission continue to be important in many parts of the world, for example through intravenous drug use and homosexual sex. There is little evidence of a culture of intravenous drug use among fisherfolk although such use has been recorded among some SE Asian offshore fishing crews, where the presence of tattoos is also related to seroprevalence rate – suggestive (but not diagnostic) of infected needles as a transmission route (Entz *et al.* 2000). There are few accounts of homosexuality in fishing communities, with the only account of openly acceptable male homosexuality coming from a study of a fishing village in coastal Brazil (Cardoso 2002). Acheson's (1981) review of the anthropology of fishing, which identifies a 'macho complex' among North Atlantic fishermen, implies that homosexuality is less likely to be acceptable in that context. The close confinement of men and the lack of women on many deep-sea fishing vessels make homosexual contact possible – a situation not dissimilar to prisons, where HIV/AIDS prevalence has often been found to be rising (UNAIDS 1996). Overall, however, it can be assumed that the primary correlate of high seroprevalence rates in many fishing communities lies in patterns of heterosexual behaviour.

Mobility as a factor associated with high HIV prevalence

Many fisherfolk – even small-scale fisherfolk doing day-trips – are geographically mobile over their lifetimes and can often be classified as seasonal or long-term migrants or even, in some cases, as nomadic populations (Acheson 1981; Allison and Ellis 2001; Overå 2001). Migrants have frequently been characterized as a 'vulnerable group' in HIV/

AIDS studies (papers in *International Migration* 36 (4), 1998; UNAIDS 2001; Chua 2003; IOM 2003). Mobile traders, such as matooke (cooking banana/plantain) sellers, for example, were viewed as one of the key risk groups in studies of HIV/AIDS transmission in Uganda (Seeley *et al.* 1994; Nunn *et al.* 1996); like fisherfolk visiting ports and landing stations in the same region, these are mainly young men travelling to sell produce in trading centres, where they accessed sexual services (Pickering *et al.* 1997b; Gysels *et al.* 2002).

Mobile populations have also been characterized as a risk to sedentary populations, with some governments seeking to control the movement of potentially infected individuals; 60 countries are listed by the United States of America, Department of State (2002) as having HIV testing requirements for immigrants, for example, compulsory testing of all visitors staying longer than 3 months (Russia) and applicants for residence (Australia). While such requirements are unlikely to apply to fishers residing in a foreign port for a few days, official interest in the HIV status of deep-sea fishermen in the Gulf of Thailand is at least partly rooted in these concerns (Entz *et al.* 2000).

Identifying migrant fisherfolk (both fishermen and women fish traders and processors) as a high risk group seems likely to add to pressures to 'sedentise' them, at the risk of disrupting well-adapted patterns of production and institutions for resource management that have evolved to absorb resource fluctuations, population increases, and the economic and political shocks prevalent in many of the countries where migration continues to be an important livelihood strategy for fisherfolk (Allison and Ellis 2001; Overå 2001).

Cash incomes and poverty traps

For many young men and women, migration and mobility may represent opportunities to escape the moral constraints and financial obligations of family and village society and to earn cash incomes. Fishing, processing and trading provides almost daily cash income to small-scale, inshore fisherfolk and fish traders, and irregular but substantial sums to offshore fishermen. In studies conducted recently, small-scale fisherfolk's incomes have been found to be comparable or higher than those of other occupational groups in the same areas (Tietze *et al.* 2000; Allison 2004). In the context of generally low incomes, this may not make fisherfolk 'wealthy' by absolute standards, but in a very poor coastal or

lakeshore village, they may be among the few people with a disposable income. Other definitions of poverty that go beyond quantifying incomes tell a story of continuing social and political marginalization and consequent vulnerability among fisherfolk (Béné 2003).

A combination of insecurity of resource access and tenure arrangements, the uncertain production environment, potentially exploitative labour conditions for crew members and heavy competition for income-generating opportunities among small-scale entrepreneurs in processing and trading sectors, may combine to create 'poverty traps' (Barratt and Swallow 2004) whereby the cash surplus fisherfolk generate is insufficient to move out of their current situation into a more secure livelihood or to invest in material assets, but is more than sufficient for daily subsistence needs. Away from home and family, and with few options for saving and investment, this can lead to spending of this small surplus on drink and sexual adventure.

Fishing, drinking, and sex

One of a number of possible explanations in the literature for the existence of a culture of hard-drinking and casual sexual relations among some fisherfolk is based in their poverty and marginalization. This view of drunkenness as being rooted in class inequalities has a venerable Marxist history:

"Liquor is almost their only source of pleasure, and all things conspire to make it more accessible to them... Drunkenness provides the certainty of forgetting for an hour or two the wretchedness and burden of life. Drunkenness has here ceased to be a vice... They who have degraded the working man to a mere object have the responsibility to bear."

Engels (1969, pp. 133–134) writing in 1845 about the English working class.

This class-based analysis finds echoes in more contemporary studies of fishing communities in Uganda:

"The laborers in the course of production intensify their output and exhaust themselves throughout the night, making themselves more vulnerable to the extraction of more surplus value by the owners of the nets and canoes... Their lives are characterized by naked exploitation, frustration and dehumanization of labor... They drink 'cheap and hard' liquor like *waragi* and *kasese*, after work [i.e. in the morning] which contributes to dulling their senses to make it possible for them to sleep soundly."

Asowa-Okwe (1996, pp. 228–230) on fishing boat crews on Lake Kyoga in the 1990s.

Accounts of a subculture of hard-drinking among fisherfolk can be found in both academic studies and the informal views of fishery officials and other social commentators:

“[T]he trawler crews are still a race apart, perhaps the last of wild men in this tamed island of ours, fellows capable of working day and night without food and sleep, when the occasion demanded it, and then also capable of going on the booze with equal energy and enthusiasm.”

Author and playwright J.B. Priestley (1984), writing about Hull trawlermen in 1933.

“In Kerebe harbour, the ‘boom-town’ of [Nile] perch-fishing, the beach was crowded with energetic fishermen. Their usual behaviour was to leap out of their boats, grab their pay, and make straight for the pombe (banana home-brew) bars until the next day.”

Appleton (2000, p. 23) on the Tanzanian shores of Lake Victoria.

In Africa, this drinking culture is supported by a boom in village-based brewing and distilling, often promoted as a livelihood diversification strategy and a means of generating income for women, the main brewers and sellers (Bryceson 2003).

An anthropological study of drinking culture (Singer 1986) is required to elucidate whether observed heavy drinking behaviour lies in the despair of poverty, in cultural models of masculinity, or simply in being young, away from home and having some cash to spare. The last of these reasons echoes current concerns by policy-makers in the UK over the health and social costs of a ‘binge drinking’ culture among the countries’ young women and men of all social classes (Pearson 2004, p. 600).

Whatever the reasons for it, among the many health-related implications of drinking behaviour in some fishing communities are its associations with high-risk sexual activity. Heavy alcohol consumption reduces inhibitions and impairs decision-making. Increased sexual promiscuity and risky decisions over condom use may be associated with alcohol abuse (Setel 1999, p. 98; Mbulaiteye *et al.* 2000).

Gender inequality and risky ‘transactional sex’

Many authors point to the easy availability of commercial sex in fishing ports. Hugo (2001) notes that each fishing port along the north coast of Java, Indonesia, has its own commercial sex work

industry located in proximity to the docks and that there are even ‘*akyat-barko*’ women (literally, ‘those who climb up into the boat’) in many ports. In Vietnam, traders bringing produce out to deep-sea fishing boats in harbours have also begun to offer sexual services (Trang 2002). Entz *et al.* (2000) identify, among other factors³, making a greater number of visits to commercial sex workers as being associated with higher HIV-1 prevalence in fishermen working in Thailand.

On the shores of Lake Victoria, the Nile Perch fishing boom has attracted many male fishers as temporary migrants to landing sites on the lake-shore. This, in turn, attracts women in search of independent lives who provide lodging, drink, food and sexual services (Appleton 2000; Zwick and Smith 2001, p. 12). Women are also attracted into both commercial-scale processing of Nile Perch fillets for export, and into small-scale buying, processing and selling of Nile-perch by-products and other fish species traded in the region. Small-scale fish processing has low barriers to entry and is highly competitive. Often, to secure a portion of the catch from a fishing boat to process and sell, women fish traders will offer sexual services (Geheb and Binns 1997, p. 83). In Benin, where fishing and fish-trading are strongly gendered, 90% of transactions recorded in a recent study involved the exchange of sexual favours or ‘transactional sex’ (Fabio Pittaluga, Sustainable Fisheries Livelihoods Programme, FAO, Rome, unpublished data).

Either as sex workers, girl-friends, partners or as wives, women in the developing countries’ fishing communities that have high HIV/AIDS prevalence are generally in a subordinate social position to men (Williams *et al.* 2002) which limits, for example, their ability to negotiate for the use of condoms during sex. If they want children then they have no choice but to risk infection (Panos Institute 1990, p. 46–49; Denenberg 1997). It is difficult to see how the spread of HIV/AIDS will be controlled in these particular circumstances without some reworking of male identities with respect to sexuality. So long as masculinity for some fishermen is proved by them having multiple sexual partners, the spread of HIV/AIDS in their communities of interaction seems unlikely to be controlled.

³This multivariate regression analysis (Entz *et al.* 2000) also identifies being 25–32 years of age, being unmarried and having a tattoo as being associated with the highest HIV-1 prevalence.

A subculture of risk?

The arguments presented above emphasize mobility, absence from home, youth, cash-income, a masculine subculture that condones or encourages casual sexual encounters and the ready availability of commercial sex as 'facilitating conditions' for high-risk multiple-partner sex among fisherfolk. We have also argued that poverty, social marginalization and gendered power inequalities, leading to weak sexual bargaining power among women are potential underlying causes of behaviour that leads to high HIV/AIDS vulnerability. Heavy drinking, whether encouraged by masculine cultural norms, a response to the physical demands of fishing or the despair of poverty (or some combination of these factors) is also associated with high-risk sexual behaviour. An alternative, but not mutually exclusive explanation for observed patterns of sexual mixing (Pickering *et al.* 1997a; Entz *et al.* 2000) lies in the occupational subculture of fisheries with respect to taking risks. This explanation is not dependent on hypothesized links between poverty, despair and high-risk behaviour and may thus apply to the non-poor also.

Social and cultural attitudes, beliefs and values play an important role in the perception of, and response to, danger. The denial of danger, an emphasis on independence and fatalism are common themes among many fishermen (Poggie *et al.* 1995). It has been suggested that these attitudes may apply as much to attitudes about safe sex as to safe seafaring (SPC 1999) although studies of small-scale gold-miners who accept high physical risks in their work but adopt risk-averse economic strategies caution against over-generalizing attitudes to risk (Grätz 2003). Certainly, a fatalistic attitude to risk was evident in Ugandan fishing communities in Pickering *et al.*'s (1997a) study and is encapsulated by the young man from Kasensero village, on the Ugandan shores of Lake Victoria, saying in 1989 'I cannot think about this AIDS business. I could drown tomorrow. There are too many girls here.' (Barnett and Whiteside 2002; p. 19).

A caution against stereotyping and blaming

The above review attempts to connect known risk factors from the literature that appear to apply to some fisherfolk with the observed high levels of HIV prevalence or AIDS deaths in some fishing communities. Not all fishing communities are subject to

these risk factors and therefore not all will be at higher risk of HIV/AIDS infection than other sectors of the population. Both Thompson's (1985) account of power relations between the sexes in Scottish fishing communities and Tunstall's (1963) study of the Hull distant-water fleet go beyond what can easily become stereotypes to describe alternative images of fisherfolk that include family loyalty and temperance and gender relations in which women have greater agency than is sometimes assumed for fishing communities. Moreover, Tietze *et al.*'s (2000) study of coastal fisheries in six developing countries reveal that fisherfolk's saving rates (proportion of net income saved) exceed those of farmers living in the same areas, suggesting that, for the majority, their incomes are not dissipated in a life of drinking and commercial sex. Our own work in East Africa reveals that many fishing boat owners started out as crew members and saved steadily over decades to build up their household asset bases, often in the face of conflict, increasing levels of theft, a hostile or indifferent public service environment, diminishing fish resources and high levels of climatic and macro-economic uncertainty (summarized in Allison 2004). These studies and others from SE Asia and West Africa (Pollnac *et al.* 2001; Neiland and Béné 2004) confound the 'poverty trap' view and support an alternative image (which can of course coexist with the wild-living hyper-masculine one) of fisherfolk as hardworking, adaptable, innovative and forward-thinking, using fishing as a means to ensure livelihood security and climb out of poverty.

Identifying an occupational group or sub-population as 'high-risk' carries the danger that people will blame fisherfolk for the behaviour that exposes them and their sexual contacts to risk, without attempting to understand the reasons for it. We have tried to show that the risk factors associated with high HIV prevalence rates in some fishing communities are complex and embedded in the economic, social and cultural contexts in which fisherfolk pursue their livelihoods. Cultural theory can be usefully employed to explain behaviour that may appear irrational or morally deviant to those looking at it through the lenses of economic rationality, Darwinian sociobiology, or social theory (Douglas 1992; pp 102–121). Anthropologist Mary Douglas, in her book 'Risk and Blame' analyses the cultural construction of risk and its relation to centre-periphery relationships, including marginalized or enclave groups such as homosexual men and 'wider society'.

It is a useful theoretical starting point for those seeking to understand, rather than blame.

It is also important to emphasize once again that the factors that may lead to some fisherfolk in developing countries being at risk of HIV/AIDS also apply to other sectors of society or occupations that share similar characteristics of being dangerous or physically demanding, and being pursued largely by young men away from home and with cash to spare, such as mining, construction work or the army (Setel 1999; Foreman 2002; Campbell 2003; Chua 2003). Additionally, small-scale fishing communities in developing countries are often comprised of socially marginalized, landless, migrant people, sometimes drawn from minority ethnic groups with little purchase on state decision-making processes (Allison and Ellis 2001). Other spaces where the marginalized or displaced are concentrated, such as urban slums and refugee camps often have similarly high rates of HIV infection (UNAIDS 1997; Campbell 2003, p. 45–60). In such places “if you have no job and no future, life becomes cheap, and sex is a dangerous entertainment fuelled by boredom, alcohol and poverty.”⁴

Cultural constructions of masculinity leading to high-risk behaviour are a common thread in circumstances such as those described above and major efforts are being made by NGOs, such as VSO Southern Africa, in “engaging men within the pandemic in regard to behaviour change, caring, and active community responsibility” (VSO-RAISA 2003, p. ii). Many interventions in HIV/AIDS prevention fail “because they do not take into account the identity construction of the men who interact with women and girls as partners, husbands, fathers, teachers and so forth” (VSO-RAISA 2003, p. 4). This failure to engage with men as a part of ‘gender studies’, and recognize the importance of gender relations, is common in many sectors. Indeed, gender research and interventions in fisheries have tended to focus solely on women.

Whatever the reasons, the existing data and widespread qualitative evidence on HIV seroprevalence rate reveal that a high-risk subculture exists among some important fisheries in developing countries (e.g. the Gulf of Thailand; the African Great Lakes, West African Coastal fisheries). The consequences of the observed patterns of behaviour may be far reaching, not only for the fisherfolk

themselves, but the communities they interact with, the economies they contribute to, the consumers they supply and the conservation of the fish resources they harvest.

The implications of high HIV rates for fisheries management and development

The ILO have projected that HIV/AIDS may cause a drop in economic growth by as much as 25% by 2020 in Sub-Saharan Africa because of death and illness among workers in their most productive years (ILO 2000b). They predict that the worst-affected sectors will be transport, mining and fishing. The impacts of HIV/AIDS go well beyond the macro-economic, however, and we review briefly the likely impacts for individual fisherfolk who are infected, their households and the communities that they live and work in, as well as impacts on overall fisheries production. The review follows and expands upon the schematic diagram in Fig. 1.

Individual and household-level impacts

Barnett and Blaikie (1992) were among the first to focus attention on the vulnerability to labour loss of production systems in developing countries. At the household level the HIV-afflicted person’s labour input gradually diminishes as they succumb to sickness, and the labour of other household and extended family members is often diverted to care for the person who is sick. Dolan (2002, p. 20) quotes a female-household head in Mubende, Uganda as saying “[there is] no flexibility [in labour]. If the wife is sick the children cook and someone is hired to dig. [The] husband does not do any home chores.” So when considering the impact of HIV/AIDS on labour, it is important not to just focus on so-called productive roles. When people are sick or die the reproductive as well as productive labour has to be done by someone. In the considerable literature on ‘AIDS-orphan’ the role of grandmothers (and sometimes grandfathers) as carers who take on the reproductive role for their lost children, particularly daughters and daughters-in-law, has been highlighted (Appleton 2000; Hunter 2000; Kamal Smith 2002).

Many fishing families in developing countries combine fishing with farming (Allison and Ellis 2001; Béné 2003), so that loss of adults in the prime of life leads to serious labour shortages for both these activities, as well as for childcare and household maintenance. The symbiosis between

⁴University of Witwatersrand research on risk taking behaviour among youth in Soweto, South Africa’s largest township, cited in VSO-RAISA 2003, p. 4).

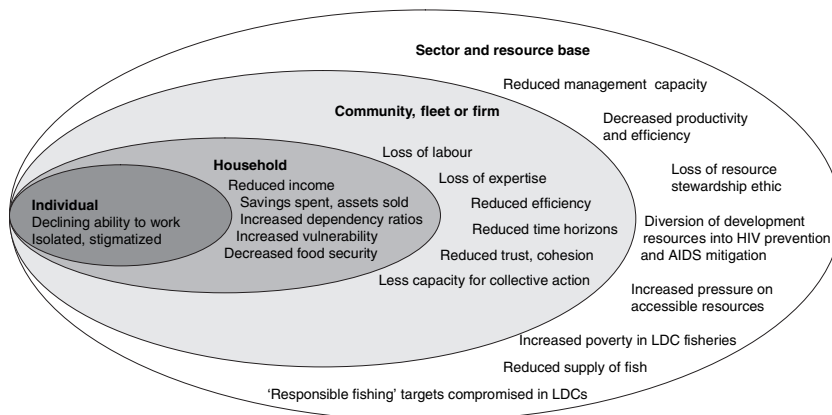


Figure 1 Simplified schema of the potential impacts of HIV/AIDS on the fishery sector at different levels. Darker shaded areas represent known and documented impacts, while lighter or unshaded areas represent more speculative concerns. Impacts at supra-household level will apply if seroprevalence is high enough to have significant impacts, as it has demonstrably done in other rural production sectors (see section The HIV/AIDS epidemic and its development impacts). More detailed explanations are given in the text (see section The implications of high HIV rates for fisheries management and development).

male-dominated fishing and female-dominated farming, on which household survival is built, ceases if adults of either sex fall ill or die (Appleton 2000). More dependants then rely on a smaller number of productive family members. There is a general decline in the productive capacity of the household: less fishery income often means less cash for purchase of agricultural inputs, which in turn means reduced agricultural production, and further reduction in household income and access to food. A typical coping strategy is to spend savings and income and to sell productive household assets, thereby increasing vulnerability. The cost of care for anyone with AIDS-related illness leads to an increase in household expenditure on medical treatment, transport and special foods. This cycle spells a descent into deeper poverty, exacerbated by the social and economic stigma experienced by relatives of people known to have AIDS. This process is summarized in Fig. 2.

An example of shifting labour roles in fishing communities in Uganda was described in a recent study (Seeley *et al.* 2003, p. 73). In fishing communities where there is increasing ill-health because of HIV/AIDS infection, an inability to withstand the physical rigours of deep-water fishing is resulting in some men withdrawing from fishing and remaining on shore. As a consequence they are taking over traditionally female activities such as fish processing. There is some evidence that these men face a

loss of social status and respect but, notwithstanding this, the repercussions for women displaced from this activity are far more serious, particularly as employment opportunities for women in fishing communities tend to be very limited and associated with high levels of commercial sex work.

A concrete example of the effects of stigma for households affected by HIV/AIDS lies in access to credit (capital being a key limiting factor in enabling households to gain access to assets such as land or fishing gear). The stigma of AIDS 'encourages' the lending authorities to discriminate against afflicted households when allocating loans, but also discourages lending on the pragmatic grounds that such households are thought to be likely to default on payments because of long-term illness and death. Those people perceived to be members of 'remnant' households (perhaps a grandmother with grandchildren, an adolescent with younger siblings, or a young widow with small children) are then left to cope with the impact of HIV/AIDS and find themselves ineligible for loans or business development support because they do not meet age or asset ownership criteria (Barnes 2002).

Impacts at community or enterprise and sectoral levels

Beyond the tragedies of individual households lie the impacts of AIDS at community or enterprise

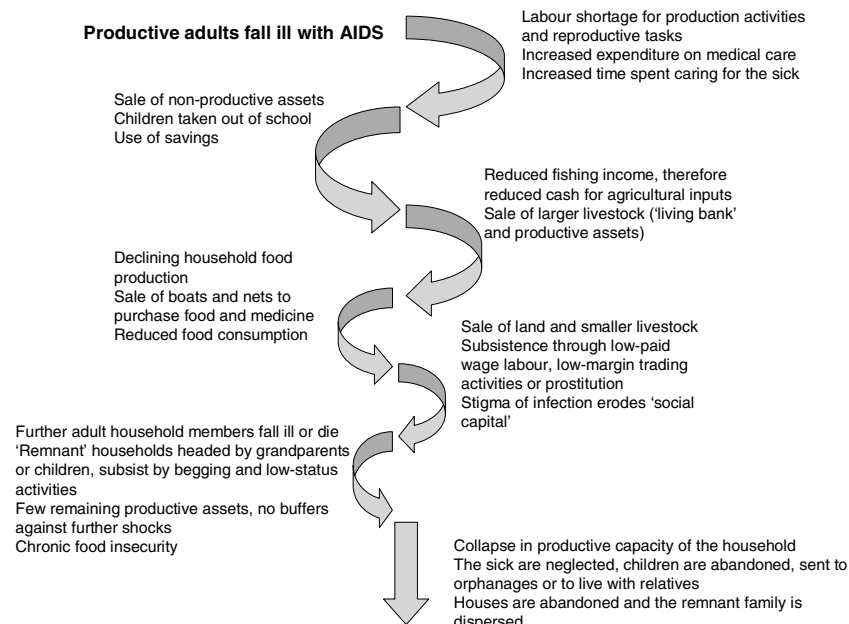


Figure 2 Generalized downward spiral into destitution of a fishing/farming household in a low-income developing country, resulting from HIV infection and subsequent development of full-blown AIDS by one or more productive members of the household. Further details and references describing these processes and how they might vary are given in the text.

(firm or fleet) level. Although household-level effects are now fairly well understood, the impacts of a high rate of HIV prevalence on community-level life remain largely undocumented, with the few discussions of these topics being highly speculative in nature. Simon-Meyer (2002) summarizes, from a South African perspective, the potential impacts of HIV/AIDS on the availability, productivity and needs of employers in both the capture fisheries and aquaculture and related industries:

- 1 Offshore or deep-sea fishers are at risk of becoming the vector by which HIV can spread both nationally and internationally
- 2 The impact on the manufacturing and distribution elements of industries related to fishing can be considered similar to those of any manufacturing enterprise. HIV/AIDS has similar negative effects on economic performance to any factor that affects the availability, performance, required or available skills, or cost of labour
- 3 The loss of staff with key skills that are crucial to output – e.g. factory managers, trawler skippers, engineers, fishery managers – are especially disruptive
- 4 If fishers in offshore or long-range fleets become ill, catching operations can be jeopardized
- 5 In shore-based operations, illness of workers can result in absenteeism. Compassionate leave for funeral attendance is one of the major causes of absenteeism in Southern African industry and civil service sectors
- 6 Death of workers and the poor morale resulting from fear and uncertainty about HIV/AIDS and the loss of colleagues all have a negative effect
- 7 There can also be increased disruption in the workplace because of increased workloads for those remaining healthy and discrimination against those believed to be HIV positive
- 8 In small-scale or subsistence fisheries, illness may affect the physical ability to fish, thus endangering the food supplies of infected or affected families and communities
- 9 Illness may increase pressure on those species requiring less physical effort to harvest, or being closer at hand and requiring less capital to access, such as intertidal and reef resources
- 10 Families under stress from illness or death of breadwinners might turn to accessible waters of the coast and rivers in search of free food
- 11 There may be impacts on food markets for staples (e.g. canned pilchards, dried fish) of some lower income groups if catching operations are reduced

We have sometimes heard, in informal discussion with fishery managers and advisors, the rather unpleasant speculation that the HIV/AIDS epidemic may somehow be 'good' for the conservation of fish stocks and other environmental resources. The reasoning is that with increased mortality comes reduced population growth and consequent avoidance of Malthusian over-fishing. This presupposes that simple Malthusian processes are the main cause of environmental and resource degradation – often a highly questionable assumption (Allison 2002). The only available review of the impacts of the HIV/AIDS pandemic on natural resource management comes from the African Biodiversity Collaborative Group (ABCG 2002, p. 2), whose key findings were that the epidemic is leading to:

- 1 Overuse of natural resources, including medicinal plants, timber for coffins, and wildlife for food
- 2 Changes in land use as agricultural practices adapt to falling capacity for heavy labour
- 3 Changes in access to resources and land especially when widows and orphans cannot inherit land
- 4 Loss of traditional knowledge of sustainable land and resource management practices
- 5 Loss of human capacity for natural resource management in government, non-governmental organizations, academic institutions, communities, donor organizations, and the private sector
- 6 Increased vulnerability of community-based natural resource management (CBNRM) programs as communities lose leadership and capacity, and HIV/AIDS issues take priority
- 7 Diversion of conservation funds to communities to meet HIV/AIDS related costs

All of these imply that HIV/AIDS poses a threat to the sustainability of natural resource-based production systems.

From a fishery management perspective, a key implication of high rates of HIV/AIDS (and the associated fatalistic outlook of people in such communities) may be the loss of the long-term view that is a prerequisite for any system of management that requires cooperation or leadership from fisherfolk. The whole shift from state towards community-based or co-management that we have seen in the last 15 years is underpinned by the assumption that involvement in management will foster an attitude of long-term stewardship over fishery resources (Wilson *et al.* 2003). The implicit message is: 'Do

not overfish this year, so that you will still be fishing in 10 years time, and your children in 30 years time.' That logic is not relevant to the young men living with HIV, who know they will die within a few years, or to the women whose children are also infected. With infection rates apparently rising as high as 70% in some African fishing communities (inferred from data on national prevalence rates and the relative prevalence and death rates in fishing communities, Table 1), that is a lot of fishermen with short-term interests – does HIV/AIDS render CBNRM projects futile in these fisheries?

Local or indigenous knowledge is also championed as a basis for community-based fisheries management, as a substitute or adjunct to 'scientific' advice on the status of fish stocks (e.g. Johannes *et al.* 2000). As death rates in fishing communities increase, the knowledge that comes from long experience in the fishery is also lost along with the commitment to the notions of a fishing community and culture. Fisheries may become increasingly dominated by young men with little long-term interest in sustaining the fishery and every interest in maximizing short-term earnings. Similarly, skills and knowledge are lost from government fisheries management institutions, universities and advisory agencies as people become ill from AIDS-related illnesses. Some of those reading this article will have lost friends and colleagues.

Current attempts to support fisherfolk in finding ways out of poverty are also undermined by HIV/AIDS. In eastern and southern Africa, earning enough capital from fishing to own a boat typically takes around 8–10 years of work as a crew labourer (Allison 2003; and unpublished data). The only really effective barrier to entry to the fisheries in the region lies with the scarcity of capital that limits levels of investment in fisheries (Allison 2004). HIV/AIDS is likely to mean that it takes even longer to build up capital to invest in the sector, and that fewer fishermen will live long enough to accomplish this. Thus, fisherfolk are less likely to progress to boat ownership and the relative livelihood security this confers. This will either lead to a reduction in fishing effort due to shortage of owners or a shift in ownership of capital assets for fishing away from fishing communities and into the hands of outsiders. Diminishing capital for investment may also lead to technological stagnation or to the inability to upgrade fishing vessels to keep them safe and competitive.

What is being done to address HIV/AIDS in fishing communities?

During the course of our work in fishing communities in Africa and S and SE Asia, we have encountered projects whose activities range from the promotion of condom use among migrant Burmese fishermen working in Thai waters to the re-training of HIV-infected Zambian fishermen in less physically demanding occupations, such as tailoring or repairing bicycles. None of this work is yet documented in the peer-reviewed literature and little of it has involved collaboration with fisheries management interests.

The majority of HIV/AIDS related projects targeted at fisherfolk focus on education and awareness raising. Early HIV/AIDS prevention schemes in fishing villages were the initiative of health departments and were done independently of any fisheries planning (Balyagati *et al.* 1995). More recently, fisheries agencies in developing countries have become more aware of the impact of HIV/AIDS on the communities that they work with. The Marine Resources Division of the Secretariat of the Pacific Community were among the first fishery agencies to raise the issue of HIV/AIDS in a health and safety context, for both fish workers and fishery officials (SPC 1999), leading to a New Zealand-funded project to reach fishing communities with educational messages on HIV/AIDS through maritime training colleges (Peteru and Lambeth 2000; and Fig. 3). HIV/AIDS education and prevention campaigns have been built into the activities of several

recent fisheries development projects and programmes carried out by international agencies such as FAO and the regional development banks on, for example, poverty eradication in small-scale fisheries in Congo and Benin (SFLP 2003), fishery sector capacity-building in Papua New Guinea (ADB 2002) and workers' rights for Cambodian fishers working on Thai trawlers (Assavanonda 2001). Often, the work is conducted through NGOs, such as Family Health International, who have considerable experience in this sector. Commercial fishing companies in Namibia have also taken initiatives to conduct HIV/AIDS awareness training among their workforce (Namibia Economist 2002).

There have also been a number of more integrated projects combining education with health and social service provision. Medicins Sans Frontieres, for example, have supported education, provision of drugs and medical facilities, health care training and orphanages in AIDS-stricken Homa Bay on the Kenyan shores of Lake Victoria, where unconfirmed estimates of 70% HIV seroprevalence compare with the 15% average for adults in Kenya as a whole (Seemungal 2003).

Antiretroviral therapy provides hope to people living with HIV/AIDS. Gray *et al.* (2003, p. 1947) estimate that of the nearly 30 million people in Sub-Saharan Africa who are currently HIV infected, approximately 5.7 million HIV positive people would be currently eligible for ART (assuming viral load distributions similar to those in Rakai, Uganda). That number is far higher than the current WHO campaign (launched in late 2003) to reach three



Figure 3 Poster distributed as part of the Secretariat of the Pacific Community (SPC) 'Safe Seafaring' campaign to reduce incidences of sexually transmitted diseases, including HIV/AIDS (source: Peteru and Lambeth 2000).

million infected people with ART by 2005 (WHO 2003) and therefore ART does not replace other strategies to prevent the spread of the epidemic and mitigate its impact. The absence of a vaccine and the challenges of providing ART within existing infrastructures in poor countries, as well as, in many places, continuing and serious price obstacles to their supply, mean that mitigation must be a priority in any pro-poor policies for the rural sector in Africa and Asia.

Recognition of the high HIV/AIDS status of fishing communities is not necessarily beneficial to those communities. Even in communities where HIV/AIDS has been prevalent for some time, the stigma of infection remains. "The denial, blame and stigma surrounding HIV has silenced open discussions, delayed effective responses, and added to the burden of those living with HIV and AIDS" (Tallis 2002). Families and communities affected by HIV/AIDS fear disclosure, ostracism, and the inability to cope with the impact on their emotional as well as material resources (Aggleton and Parker 2002).

The future: planning, mitigation and research

Awareness-raising campaigns on HIV/AIDS and education programmes on safe sex and behaviour change will remain key responses to the epidemic. Such programmes are now being targeted at fisherfolk, or incorporated as part of fishery development programmes. To education must be added efforts to mitigate the impact of the epidemic, which may include providing support to those whose lives and livelihoods have been shattered.

Low-Beer and Stoneburner (2003) document the combination of factors that have led to a successful approach to arresting the epidemic in Uganda: a clear policy framework, direct communication programme, case surveillance and support from NGOs. They comment on the importance of supporting care networks like The AIDS Support Organisation (TASO), who mobilized a broad-based community approach, in which condom use was seen as useful, but not the only solution to AIDS – thus avoiding deep divisions associated with programmes that promote condom use in isolation from broader social and cultural support systems. Clearly national leadership is important but other actors must be involved, among them community-based organizations and fisherfolk cooperatives. "[U]sing what we already know and sharing lessons learned from experience are critical actions for increasing the

number of options available for mitigating the negative food-security [and other] impacts of HIV/AIDS" (Bonnard 2002, p. 7).

There are examples of emerging responses in the fisheries sector, although these remain rather isolated and poorly known. Guidelines for government agency response strategies to the impacts of HIV/AIDS in the natural resources sector have been developed (DAI 2003) and strategies for incorporating risk assessment into planning by firms, port authorities or fishing community organizations have been outlined (Simon-Meyer 2002). Risk factors may vary considerably between fisheries and need to be assessed to determine appropriate responses to limiting susceptibility of fisherfolk to HIV/AIDS. Identified high-risk groups and networks (peripatetic fishermen and commercial sex workers in fishing ports) could be supported by education and behaviour-change communications programmes, voluntary testing and counselling services, easily accessible condoms and health services to provide treatment for STDs.

At grassroots level, in some cases, fishermen's organizations are themselves taking the initiative to combat HIV/AIDS. The Uganda Fisheries and Fish Conservation Association (UFFCA) urged government to target its HIV/AIDS awareness programmes on fishing communities (Ilungole 2002).

Interventions aimed at reducing HIV/AIDS vulnerability in fishing communities should ideally be informed by relevant research. Studies of HIV prevalence and AIDS impact obviously require care and tact. While methodological guidance is available (e.g. Booysen and Arntz 2003) such research involves more than following a recipe and it is strongly recommended that any fisheries programme contemplating such work seeks the input of researchers who have appropriate experience. The traditional strengths of fisheries research in modelling and population dynamics can be brought to bear in evaluating the impact on HIV/AIDS on demographic structure of fishing communities and on future fishing effort and catch. This would complement recent efforts to model the global fish trade and supply (Delgado *et al.* 2003). Any such efforts to predict fishery futures should avoid taking people merely as optimal foragers or perfect economic rationalists and instead draw on awareness of the complexity of social, cultural and political factors that influence individual decisions and their collective outcomes. We also add our voices to those of anthropologists calling for the

necessity of understanding fishing cultures if we are to manage fisheries successfully and responsibly (McGoodwin 2001). Realistic scenarios, informed by both models and qualitative understanding of society, are likely to be more useful to planners than precise but unrealistic model predictions constructed independently of socio-political context.

Conclusions

Anyone who has a role in implementing fisheries management in the developing world, where 95% of fisherfolk and over 60% of global fish catches originate (Garcia and de Leiva Moreno 2003) should be aware of the potential influence of HIV/AIDS on the future of fisheries production systems. Although HIV/AIDS should not be considered synonymous with developing countries, it is closely associated with people living in poverty (Barnett and Whiteside 2002). This paper has highlighted the almost universally-held perception that fisherfolk are a high-risk group and has gathered the limited data that supports that perception. Although sometimes anecdotal, this data, together with the known correlates in other high-prevalence populations, suggests that HIV/AIDS is having a significant impact on the developing world's fishing communities, whether they are small-scale fishers or deep-sea commercial fishers. These impacts are potentially wide-ranging not only profoundly altering the structure of human populations but also undermining people's ability to make a livelihood. We suggest that for many fishing communities a concerted response is required; one that moves beyond information and awareness training, although these must of course continue. After 20 years of the epidemic it is important to build on experience from other sectors to mitigate the impact of the epidemic as well as to prevent its spread. Lessons can be learned from, for example, Uganda's efforts to tackle the epidemic (Low-Beer and Stoneburner 2003). It is time to ensure that the impact of HIV/AIDS is properly taken into account in the attempts of governments, donor organizations and NGOs to manage fisheries and assist fisherfolk to find ways out of poverty and vulnerability. Most of all, it is time to help those in fishing communities who are already living with HIV/AIDS to continue to enjoy productive and dignified lives.

Addendum

Since this paper was written, we have become aware of a study that has compared HIV prevalence rates in 13 villages in three areas of Western Uganda, including four fishing villages on the shores of Lake Albert (Kipp *et al.* 1995). The prevalence of HIV was 4% (95% CI 3.4–5.1%) in a sample of 13 typical rural villages, 13% (CI 10.1–16.9%) in two villages close to Fort Portal, the district capital, and an 'exceptionally high' 24% (CI 19.9–28.3%) in the four comparatively isolated fishing villages, which had a high proportion of migrating persons in them. This study adds considerable weight to the sparse available data on HIV prevalence and incidence of AIDS in fishing communities reported in Table 1, and to our tentative conclusion that HIV prevalence is exceptionally high in many African and Asian fishing communities and is strongly associated with fisherfolk's mobility.

Acknowledgements

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