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ORIGINAL PAPER

The HIV and urban food security nexus in Africa

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Abstract The relationship between HIV and food security has been characterized by a tendency to view both as primarily rural phenomena. The urban literature, in turn, has been dominated by a biomedical focus on the nutritional implications of HIV infection on people living with HIV (PLHIV). Recently, attention has turned to related issues such as the value of nutrition supplementation, the nutritional implications of anti-retroviral therapy and the impact on both of rising food prices. This paper argues that the focus on rural food insecurity, the individual PLHIV and the nutritional aspects of food security, while valuable and necessary, are limiting our ability to understand the social and economic relationships that are central to the HIV-food security nexus in urban contexts. Rapid urbanization makes food security in the urban context a complex issue with a number of different and overlapping dimensions. Understanding the reciprocal relationship between HIV and urban food security requires a new social framework which incorporates, but is not constrained by, a focus on the nutritional impacts of the epidemic.

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Introduction

Sub-Saharan Africa is home to 70% of the global total of people living with HIV. One third of the total live in Southern Africa where adult HIV prevalence in 2007 exceeded 15% in seven countries: Botswana, Lesotho, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe. Thirty five percent of global HIV infections and 38% of AIDS deaths in 2007 occurred in this region (UNAIDS 2008a). Although urban HIV prevalence rates vary considerably, in almost every country for which there are data, urban rates are higher than rural rates (Garcia-Calleja et al. 2006). HIV and AIDS are therefore central urban health and development challenges (Joseph 2010; van Renterghem and Jackson 2009). Within cities, infection rates and mortality are considerably higher among poor, informal, and migrant populations (Crush et al. 2005a; Banati 2010). Young urban women are disproportionately affected by the disease (Cohen 2000). HIV infection also leads to progressive immunodeficiency and increased susceptibility to infections such as tuberculosis (TB) (Corbett et al. 2003; Verver et al. 2004; Stanwix 2010).

The HIV and AIDS epidemic is more often associated with urban than rural areas in Sub-Saharan Africa. In the case of food insecurity, the opposite is true (Dyson 1993; Shisana et al. 2005; Kyobutungi et al. 2008; Montgomery 2009). In other words, there is a pervasive idea that food insecurity is largely a rural problem affecting rural households (Crush and Frayne 2010a). Considerable research and policy attention has been devoted to the impact of AIDS on smallholder production (FAO Committee on World Food Security 2001; ODI 2004; O'Donnell 2004; FAO 2005;

Jooma 2005; Haddad and Gillespie 2005; Edström and Samuels 2007; Gillespie 2008). This has had two results, one positive and one negative. On the one hand, there is now a considerable body of knowledge on the negative impacts of the epidemic on small scale agriculture. On the other, our understanding of the links between HIV and urban food security is still fragmentary and has to be pieced together from case study evidence.

The impact of HIV and AIDS on agricultural systems and rural household food security is generally reckoned to be devastating (Kwaramba 1997; Baylies 2002; Loevinsohn and Gillespie 2003; Murphy et al. 2005; Gillespie 2006; Whiteside et al. 2006). A 2006 FAO statement gives the impression that HIV and AIDS are no longer significant urban problems and that impacts on food security are mainly rural in character:

> In its earlier stages, the HIV epidemic was predominantly an urban problem, affecting more men than women, and those with relatively higher incomes. Now the epidemic has rapidly moved into the rural areas, hitting those who are least equipped to deal with its consequences. Today, 95% of people living with—and dying of—HIV and AIDS are in developing countries. The overwhelming majority are the rural poor, and among them women figure disproportionately. The epidemic is undoing decades of economic and social development and causing rural disintegration. For example, in sub-Saharan Africa, HIV is depleting the region of its food producers and farmers, decimating the agricultural labour force for generations to come (FAO 2006).

Giving a country focus to the argument, Bryceson and Fonseca (2006, p. 1654) argue that "beginning in 2001, smallholder peasant households in Malawi faced two life-threatening risks: AIDS and famine."

The concept of "new variant famine" (NVF) was coined in 2003 in an attempt to link the two (de Waal and Whiteside 2003). The key indicators underpinning NVF include: (a) household-level labour shortages due to adult morbidity and mortality, and the related increase in numbers of dependants; (b) loss of assets and skills due to adult mortality; (c) the burden of care for sick adults and children orphaned by AIDS; and (d) the vicious cyclical interaction between malnutrition and HIV. While such indicators are not necessarily rural in focus, they have tended to be interpreted through a rural household lens (Ansell et al. 2009). Despite the rapid progression of the epidemic in rural areas, it remains a major challenge to urban food security (Crush et al. 2007, UNAIDS 2008a).

In practice, the two spheres of "urban" and "rural" are entwined within a complex relationship, particularly in the context of the social economy of migration and mobility in Southern Africa. Because of these inter-linkages, the impact of the AIDS epidemic in rural areas is not irrelevant to assessing its impact on urban food security (Drimie 2002). For example, urban populations that receive informal food transfers from the countryside will be affected by any AIDS-induced fall in rural household production. If HIV and AIDS prompt migration out of rural areas, so the numbers of poor, food-insecure urban dwellers will swell. When urban PLHIV (People Living with HIV) return to the rural areas for family care and to die, the food needs of the urban household decrease even as those of the rural household escalate. If migrants living in urban areas are unable, through ill-health, to work and remit, there is less income for both the rural and urban households to purchase food. In other words, in rural areas the epidemic impacts on urban food security and vice-versa. In this context, the separation of the "rural" and the "urban" into discrete spheres is an artificial construct.

The 'vicious cycle' of undernutrition and HIV

Biomedical researchers have produced a considerable body of information and analysis on the impact of malnutrition on the course of the disease in PLHIV as well as the nutritional impact of HIV infection on the individual (Gillespie and Kadiyala 2005; Piwoz and Preble 2000; Chopra 2003; Anabwani and Navariob 2005; Sztam and Ndirangu 2005; Edström and Samuels 2007; World Bank 2007; Panagides et al. 2007; Gillespie 2008; Anema et al. 2009). The complex connections between HIV and nutrition have been represented in various ways. In diagrammatic form, for example, Fig. 1 depicts the negative impact of HIV on the individual's immune system, vulnerability to infection, nutritional status and nutritional needs, and the cumulative impact of each of these factors on the others. Figure 2 provides a more detailed representation of these relationships as well as the types and variety of opportunistic infections and physical and mental diseases that result from an HIV-compromised immune system.

The relationship between HIV and nutrition in the infected individual has also been represented in narrative form as a "vicious circle" (Haddad and Gillespie 2005; Visser 2005; Enwonwu 2006):

> At an individual level, HIV essentially accelerates the vicious cycle of inadequate dietary intake and disease that leads to malnutrition, while malnutrition increases the risk of HIV transmission from mothers to babies and the progression of HIV infection. Nutritional deficiencies may lead to oxidative stress and immune suppression which in turn lead to increased HIV replication and hastened disease pro-

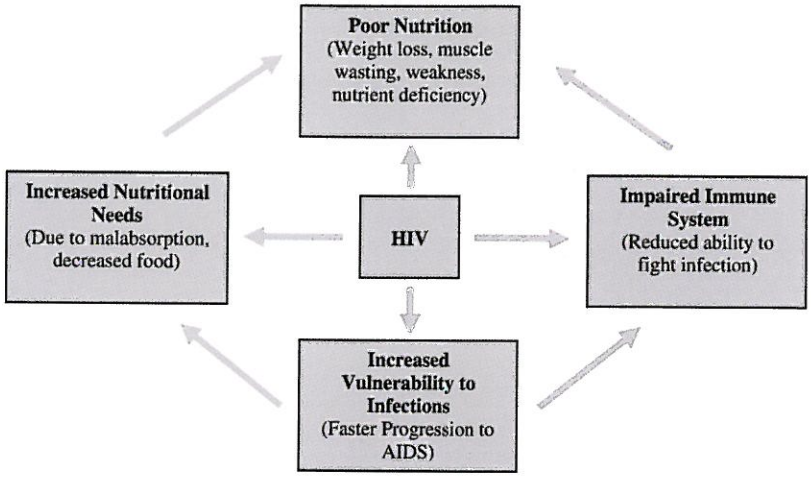

Fig. 1 The nutritional impacts of HIV infection. Visser (2005)

> gression. Increased morbidity brings with it heightened nutrient requirements and reductions in the efficacy of absorption and utilization of nutrients (Haddad and Gillespie 2001, p. 495).

Lack of access to adequate foods (a key element of food insecurity) leads to a suppressed immune system, increased risk of mother to child transmission and decreased resistance to HIV. Infection with HIV itself reduces the efficacy of nutrient absorption and utilization by the body. As Ivers et al. (2009, p.3) note, "malabsorption of fats and carbohydrates is common, the former adversely affecting the absorption and utilization of fat-soluble vitamins, compromising immunity and worsening nutrient deficiencies. Infections and nutritional deficiencies cause an increase in pro-oxidants, resulting in oxidative stress, which may indirectly accelerate HIV replication". Micronutrients take on "special importance in populations with marginal intakes" (Visser 2005). However, it has been difficult to show causal associations between "specific deficiencies and adverse clinical outcomes in HIV-infected persons, and data linking replace-

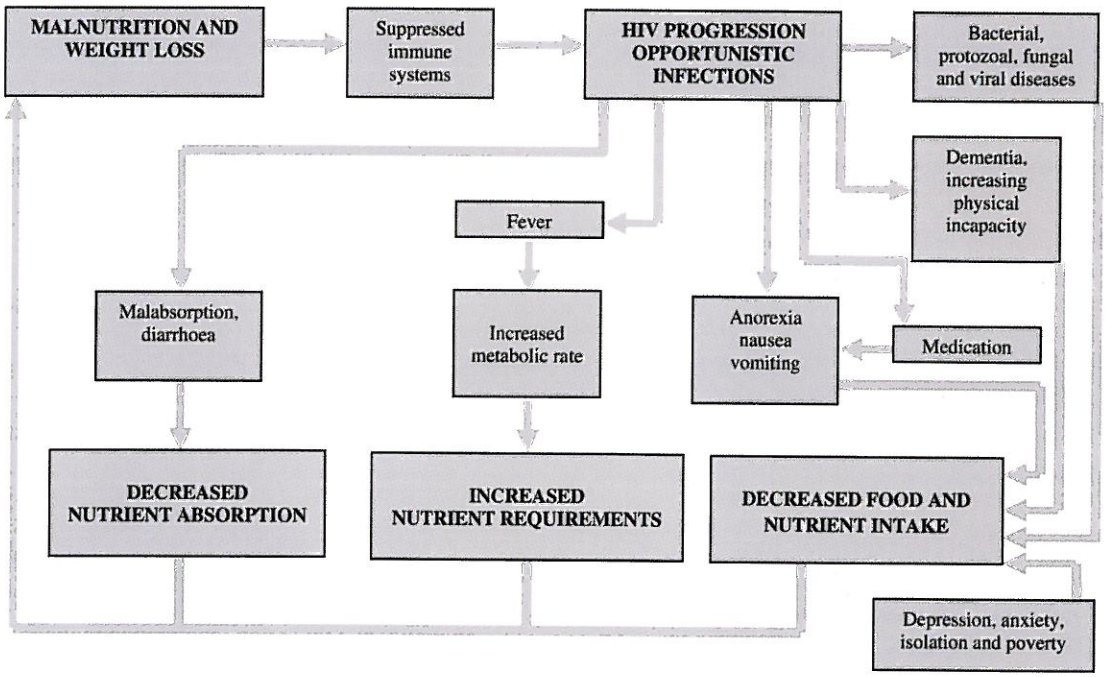

Fig. 2 The vicious circle of HIV, nutrition and opportunistic infection. Adapted from RCQHC (2006, p. 103)

ment or supplementation of specific micronutrients have been sparse and inconsistent" (Marston and De Cock 2004; Hattingh et al. 2007).

Individuals with HIV are also more likely to suffer loss of appetite, reducing dietary intake just when requirements are higher. PLHIV have higher nutritional requirements than normal, particularly with regard to protein (up to 50% increased), and energy (a 10–30% higher energy requirement than a healthy adult without HIV) (WHO 2003). Children with HIV have an energy requirement that is 50–100% higher than normal. Although there is no direct evidence that malnutrition per se increases susceptibility to HIV infection, there is certainly evidence that poor nutrition leads to more rapid HIV progression, and the more rapid onset of the "opportunistic" infections and diseases that commonly accompany immune-suppression (van Lettow et al. 2003; Annan 2009). These infections increase nutritional requirements still further.

Adequate dietary intake is essential for maximizing the full benefits of antiretroviral therapy (ART). There is evidence that ART without adequate nutrition results in lower survival rates (Raiten et al. 2005; Paton et al. 2006; Friis 2006). Adequate nutrition for vulnerable groups, particularly PLHIV, is critical as it improves health and economic productivity, allowing them to resist opportunistic disease, remain in productive employment and contribute to household income and food security. A recent study in Lusaka, for example, found that adherence to ART by food-insecure patients was significantly improved by food supplementation (in the form of monthly rations from the World Food Programme) (Cantrell et al. 2008). Speculating on the reasons, the authors suggest that the incentive of food parcels encouraged patients to go to the distribution points at hospitals and clinics where they also received their ART. In other words, there is no evidence that the same results would be achieved if food parcels and ART were available in different places. Regardless, the results suggest that food insecurity is a major barrier to ART adherence. Reasons include the fact that ARVs increase appetite and lead to intolerable hunger in the absence of food; that the side effects of ARVs are exacerbated in the absence of food; and that competing demands between food and treatment costs lead people to default from treatment, or give up food to get medications (Weiser et al. 2010; see also Weiser et al. 2003).

For all its strengths—and contribution to the development of evidence-based nutritional programmes for PLHIV—the biomedical literature generally does not stray too far from the health status of the individual (FANTA 2006). The relationship between nutrition and HIV is generally not viewed as place-specific nor is there much differentiation between rural and urban PLHIV. Research studies on PLHIV are conducted in both rural and urban areas and sometimes both within the same study. Certainly, rural PLHIV who are generally more malnourished may experience the cycle with particular intensity and viciousness. However, this does not mean that the urban poor will somehow experience these effects any less intensely, simply by virtue of being in urban areas.

What the biomedical literature generally cannot consider is the fact that the determinants of food insecurity and malnutrition are different, and far more complex, in urban than rural areas. The degree and extent to which the urban PLHIV is locked into the vicious circle depends on a whole host of general and city-specific economic, social, and political factors that are impervious to biomedical testing. As Panagides et al. (2007, p. 3) point out, "inequities in health, nutrition and food security are the product of the underlying social economic and political structures and tensions in a society. These inequities exacerbate the effects of HIV and AIDS and food insecurity to the point of eroding a community's physical, human and economic capital, and consequently its capacity to respond and recover from these conditions." They go on to argue that health sector responses to the immediate causes of HIV and AIDS and undernutrition need to be "reframed" within a comprehensive approach to understanding and addressing wider structural and systemic factors that fuel food insecurity and vulnerability to HIV (see also Farmer 1999; Ivers et al. 2009). The following sections of the paper are a contribution to this reframing process.

Rapid urbanization and HIV

The spatial distribution of the HIV epidemic generally overlaps with the distribution of populations suffering from low dietary quality, quantity and diversity (Ivers et al. 2009; Gillespie and Drimie 2009). In the late 1980s, HIV prevalence rates in Southern African cities were extremely low. Not only have they grown dramatically in the intervening two decades, but the urbanization process itself has been extremely dynamic. Most analysts have overlooked the fact that the rapid growth of the HIV epidemic coincided with a dramatic increase in urbanization in the region. Part of the reason for the "spectacular" growth of the epidemic in Southern Africa therefore lies in the massive movement of people to the cities and the rapidly growing numbers of people exposed to high-risk urban environments.

In 1990, the urban population of Southern Africa was 53 million, a number that rose to 77 million in 2000 and is estimated to be around 110 million at the present time (Fig. 3) (UN-HABITAT 2008). The UN projects that by 2030, the urbanized population of the region will exceed 200 million. Of these 60 million will be in the DRC (Democratic Republic of the Congo), 38 million in South Africa, 25 million in Tanzania, 22 million in Angola and 17 million in Mozambi-

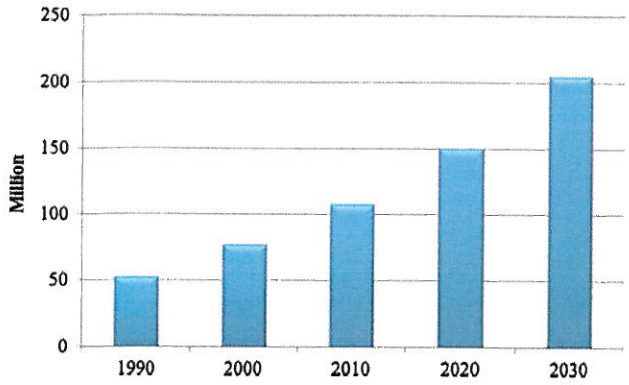

Fig. 3 Growth of urban population in Southern Africa, 1990–2030. Data from UN-HABITAT (2008)

que (Fig. 4). Southern Africa has the highest rate of urbanization in the world and is expected to be two-thirds urbanized by 2030. In every country, urban population growth rates are much higher than rural growth rates.

The extent and impact of the epidemic in Southern African cities has yet to be fully documented despite some initial work on this issue by UNAIDS (Van Renterghem and Jackson 2009). HIV prevalence data derived from antenatal sites in the region suggests considerable variation between urban centres. With the exception of Namibia and Swaziland, HIV prevalence is higher in the major urban centres of countries in the Southern African Development Community (SADC) than outside them (Table 1). More generally, HIV prevalence is 50-500% higher in urban than in rural areas. Nine of the world's top ten cities with PLHIV are in SADC (Nairobi is the other) (Table 2). Combined, they total 3.75 million people. The Gauteng urban conurbation has the highest number (1.5 million), followed by Durban (730,000), Cape Town (315,000), Harare (260,000), Maputo (220,000) and Lusaka (185,000). Nearly 28% of PLHIV in Eastern and Southern Africa (and 15% of

Table 1 Antenatal HIV Prevalence in SADC Countries, 2008

Country	Major urban centres (%)	Outside major urban centres (%)
Angola	3.8	2.2
Botswana	38.9	32.6
Lesotho	37.2	22.6
Malawi	18.6	14.6
Mozambique	20.9	14.9
Namibia	15.1	18.5
South Africa	29.6	29.0
Swaziland	40.3	42.5
Zambia	25.9	14.4
Zimbabwe	15.6	7.8

UNAIDS (2008b)

PLHIV globally) live in 14 major African cities (Johannesburg, Pretoria, Durban, Cape Town, Harare, Maputo, Dar Es Salaam, Lusaka, Nairobi, Port Elisabeth, Addis Ababa, Pietermaritzburg, Kampala, Luanda, Pretoria, Harare, Kampala, Bloemfontein, East London, Maputo and Bulawayo).

According to conventional models of the spatial diffusion of HIV, an "urban" epidemic spreads to the rural areas when migrants became infected in the cities and returned to infect their rural partners. As Lurie argues, this model may have been appropriate to the very earliest stages of the epidemic but fails to account of the fact that patterns of spread quickly changed to include rural-rural transmission (Lurie 2005). The model also neglects the dense web of exchanges between town and countryside and the hyper-mobility of people within and across national boundaries in a rapidly-urbanizing region. Most new arrivals in the city congregate in overcrowded peri-urban, informal settlements. In Sub-Saharan Africa, over 60% of the urban population live in such areas. In some Southern African countries, the rates are even

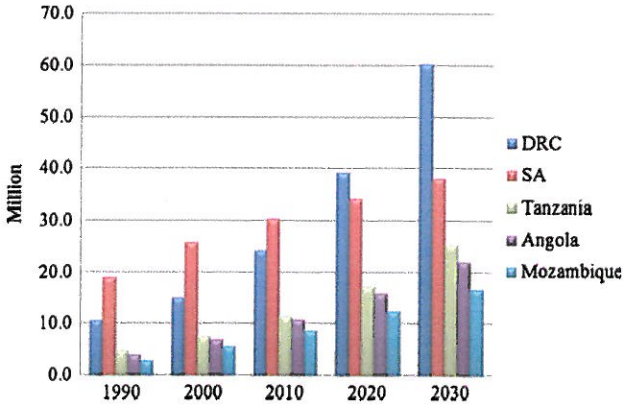

Fig. 4 Growth of urban population in selected SADC countries, 1990–2030. Data from UN-HABITAT (2008)

Table 2 Major countries and cities with PLHIVs

Countries	No. of PLHIVs	Cities	No. of PLHIVs
South Africa	5,400,000	Gauteng	1,550,000
Mozambique	1,400,000	Durban	730,000
Tanzania	1,300,000	Cape Town	315,000
Zimbabwe	1,200,000	Harare	260,000
Zambia	980,000	Maputo	220,000
Malawi	840,000	Lusaka	185,000
Botswana	280,000	Dar es Salaam	180,000
Lesotho	260,000	Port Elizabeth	155,000
Angola	180,000	East London	105,000
Swaziland	170,000	Bulawayo	90,000

Van Renterghem and Jackson (2009)

higher: for example, Mozambique (at 94%), Tanzania (84%), Malawi (83%), and Namibia (66%) (UN-HABITAT 2009). And it is precisely these areas that have the highest prevalence of HIV and therefore constitute a high-risk area for the uninfected. As Banati (2010, p.232) notes, "the urban informal context is a distinct high-risk environment, characterised by high unemployment, disillusionment, poor housing, female disempowerment, reduced access to healthcare, low economy and a lack of social cohesion." As "focal determinants" of HIV, informal settlements "amplify individual risk factors (ibid, p.232)."

The "sexual behaviour paradox" is sometimes advanced in order to try and explain the greater vulnerability of people to HIV infection in the city (Kalipeni et al. 2004). This framework constructs urban spaces as sites of greater sexual "promiscuity." Hence, according to Kalipeni et al. (2004, p.53), "high rates of sexually transmitted diseases (STDs) in urban areas, rapid urbanization amidst deeply ingrained polygamous behaviour, and the partial erosion of traditional cultures in the urban setting, including those for regulating sexual relations and practices" lead to promiscuity and prostitution. This dualistic framework is potentially problematic for it suggests that there is such a thing as a "traditional culture" to be eroded. Patterns of sexual networking and behaviour are certainly often different in town and countryside. This has been clearly shown in the numerous studies of the South African mining industry (Campbell 2003; Williams et al. 2003; Campbell 2004). Where single-sex labour migration is regularized and formalized, as on the mines, migrant communities and an associated migrant culture have developed (Campbell 2004). Sex and sexuality are integral components of such cultures, including commercial or 'transactional' sex and heterosexual as well as homosexual relations. There is an inevitable temptation to transpose the well-known mining industry migrant labour experience onto all urban areas. However, the majority of urban areas are not mining towns at all. None of the major cities of the Southern African region (with the exception of pre-AIDS Johannesburg) are based on mining.

A sexual behaviour framework may shed light on some aspects of risk-taking but it does not fully address the political, social and economic factors that shape urban spaces, lifestyles and livelihood struggles in poor areas of the city (Craddock 2000; de Bruijn 2006). In order to better understand the complex relationships between urbanization and HIV and AIDS, a framework is needed which takes into account, firstly, the physical and social factors that shape urban spaces and consequently, determine the organization of urban life; and secondly, the multiple ways in which individuals, households and communities experience and respond to urban spaces (Crush et al. 2005a, b).

Poverty, unemployment, lack of secure income and income inequality have been advanced as key determinants of vulnerability to HIV infection in urban areas (Collins and Rau 2000; Van Donk 2002; Bouare 2007; Banati 2010). Vulnerability is intensified by inadequate access to appropriate services, inability to afford prevention or access to health care, power imbalances, loss of self-esteem (e.g. where men are unable to fulfill gender roles as breadwinners), frustration and disillusionment, and a preoccupation with immediate survival needs. Where daily survival is continuously negotiated, it is unrealistic to expect people to take seriously the as-yet invisible threat of ill health and death at some time in the future. In the context of disempowerment, some men see physical and sexual power as the only way to assert themselves and their masculinity through gender-based violence (Campbell 2004; Dunkle et al. 2004a; Kalichman et al. 2005). In such circumstances, sexual bargaining or sexual networking becomes an essential, yet hazardous, livelihood strategy.

The social environment of the city also plays a role in the transmission and progression of the disease. The urban demographic is generally younger than the rural. The average urban dweller is sexually active earlier and marries later, often putting them at greater risk due to more sexual partners. The risk of infection is highest among young urban women (MacPhail et al. 2002; Hattingh et al. 2009). Urbanization is further characterized by a decline in conventional familial social control measures. Within the urban environment, the influence of the extended family declines and the nuclear household becomes the dominant social structure. This shift leads to a decline in social support structures, which in turn increases vulnerability to contracting HIV through high-risk behaviour in the absence of resilience offered by social support structures (Dunkle et al. 2004b).

In addition to these social and economic factors, the spatial structure of urban areas plays a role in the HIV vulnerability of urban dwellers. The high housing density associated with urban poverty creates social conditions that facilitate the spread of HIV. These areas are associated with poor access to basic services, such as clean water, electricity and healthcare, all of which have been demonstrated to play a role in producing vulnerability to disease (WHO 2008a, b). Urban poverty, particularly in informal areas, creates the social and environmental context that promotes the spread of HIV infection and precipitates the progression of the disease to AIDS (Shisana et al. 2005). Recent research by the Human Sciences Research Council shows that in South Africa, HIV prevalence in informal settlements is double that of urban formal areas; 25.6% compared to 13.9% for adults aged 15–49 years (ibid).

A significant proportion of the population of Southern African cities are temporary migrants in search of employment or other forms of livelihood. Links between HIV and migration are close and complex (Crush et al.

2005b; Haour-Knipe 2008; Lurie 2006). Migration is tied to the rapid spread and high prevalence of HIV in urban settings in various ways (Dodson and Crush 2003). There is a higher rate of infection in 'migrant communities', which are often socially, economically and politically marginalized (Banati 2010). This is partly understood to be a result of migrants' multi-local social networks, which create opportunity for mobile sexual networking and concurrent partners. Migration *per se* can encourage or make people vulnerable to high-risk sexual behaviour and can often make migrants difficult to reach through interventions, whether for preventive education, condom provision, HIV testing, or post-infection treatment and care. In linking human mobility and the epidemiology of AIDS, it is important to note that different forms of migration lead to different social and geographical forms of migrant 'community' and thus to different causes and cultures of risk.

Other forms of mobility disrupt or prevent the formation of any stable, place-based community. People who have multiple 'homes', or who spend a lot of their time away from or between homes, lead lives of contingent encounters and short-term relationships, whether economic, social or sexual (Lurie et al. 2003a, b). This encourages high-risk sexual behaviour, including obtaining sex on a commercial basis. But migration and mobility do not automatically increase vulnerability. Construction workers in Johannesburg are paid so poorly that they do not have the resources to engage in risky commercial sex. Domestic workers in the same city are to some extent "insulated" from gender-based violence through residence on their employers' property, although their working and living conditions are often very basic. And informal traders are at risk from gender-based violence but use various strategies, including travelling in groups, to reduce risk (Dinat and Peberdy 2007).

In sum, the AIDS epidemic was initially an urban phenomenon but has been eclipsed within the food security literature by the focus on the rural impacts of the epidemic. This has continued despite the fact that HIV prevalence remains higher in urban than rural areas. The urban environment, for a variety of economic and social reasons, tends to increase the risk of contracting the virus. The unanswered question is what impact the epidemic has had on the food security of urban populations and whether, in turn, food insecurity makes people more or less vulnerable to HIV and AIDS.

Reframing HIV and urban food security

The following description suggests that the relationship between household food security and HIV—like that between HIV and individual nutritional status—is reciprocal in nature:

> The pandemic is being driven by the very factors that cause malnutrition: poverty and inequality. The hunger currently experienced by millions across the region increases the likelihood of HIV infection, as people are driven to adopt risky coping strategies in order to survive. These include travelling to search for food and additional sources of income, migrating, engaging in hazardous work, and, most lethally, women exchanging sex for money or food. These actions facilitate the spread of HIV, putting individuals—especially women and children—at high risk of infection. For those already infected with the virus, malnutrition exhausts the immune system, which makes people more susceptible to malaria, tuberculosis, and other opportunistic diseases, and leads to faster progression from HIV to AIDS. People weakened by HIV/AIDS find it harder to access food, because they are often not strong enough to work or to walk long distances to the market (Save the Children and Oxfam 2002).

In other words, in the context of rapid urbanization and rising poverty, the epidemic has heightened food insecurity, created newly-vulnerable populations and reduced the capacity of poor households to secure sustainable livelihoods. The confluence of poverty and HIV and AIDS in the same vulnerable urban households underpins a "vicious cycle" of household food insecurity (Crush et al. 2007).

One of the key dimensions of urban food insecurity is the poor quality of urban diets and associated widespread undernutrition. AFSUN's 2008-9 baseline household survey of 11 Southern Africa cities showed extremely high levels of food insecurity in the poorer areas of these cities. In the data set as a whole, 57% of poor urban households were severely food insecure (in terms of access to sufficient food) (see Crush and Frayne 2010b). In seven of the cities, the proportion of severely or moderately food insecure households is at or over 80%: Harare (94%), Manzini (92%), Lusaka (91%), Maseru (90%), Msunduzi (86%), Maputo (85%), Gaborone (81%) and Cape Town (80%) (Fig. 5). Food insecure households (severe and mildly food insecure) go without adequate food for an average of four months of the year. Dietary diversity is also extremely poor, particularly in food insecure households. The poorer areas of the cities where the survey was undertaken are also those which, in general, have the highest HIV prevalence. This raises the question of the relationship between urban food insecurity and HIV and AIDS from a nutrition perspective.

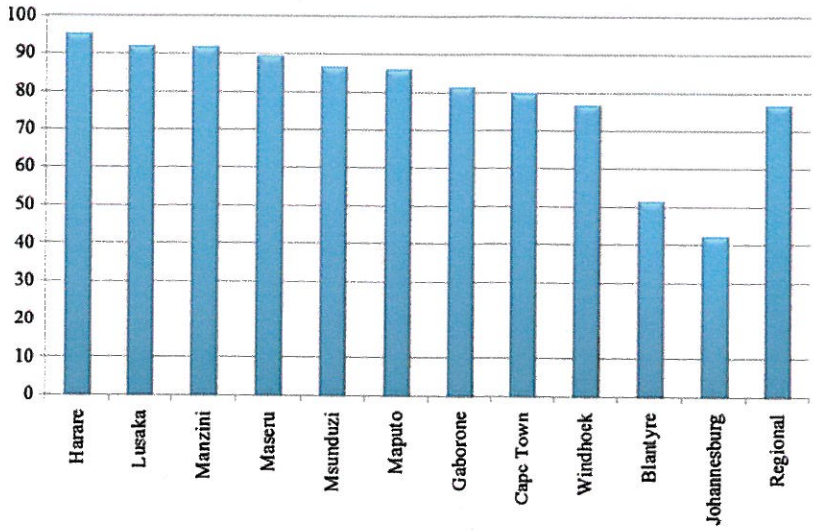

Fig. 5 Proportion of food insecure households in poor urban areas (%). AFSUN Food Security Baseline Survey. Levels of food insecurity were measured using the FANTA HFIAS Scale (Coates et al. 2007)

The "vicious cycle" of urban food insecurity and HIV can be represented diagrammatically in several ways. In Fig. 6, rapid urbanization produces a pool of urban poor who survive primarily by means of low paid temporary or casual employment, informal sector activity and social grants. Their ability to access the food they need is undermined by unpredictable income, high food prices and other basic livelihood expenses. Households make small daily purchases of food with low nutritional value leading to poor health, undernourishment, malnutrition and food insecurity. All are compounded by the unhygienic, overcrowded and service-deficient informal urban or "slum" environment. Household members live in a constant state of chronic food insecurity which leads to faster progression of the disease for those who are HIV positive. Some may resort to risky survival strategies such as commercial sex or casual exchange of sex for food.

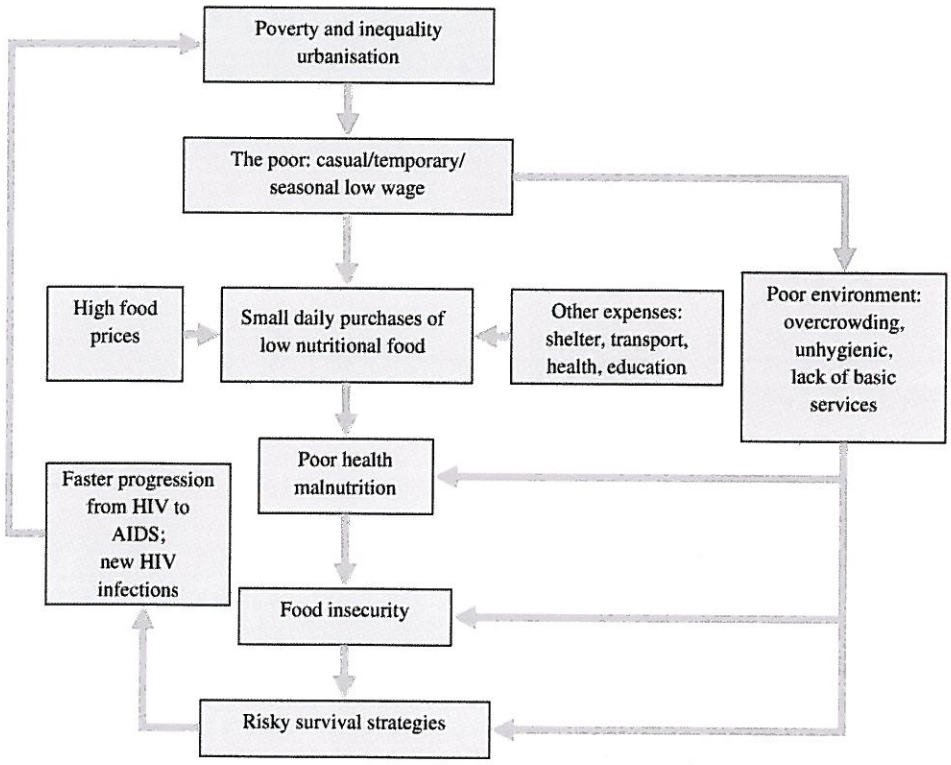

Fig. 6 Model of urban food insecurity and HIV vulnerability. Crush et al. (2007)

Although there is often agency in such activities, they lead to greater vulnerability to HIV infection and an increase in new infections.

Figure 7 focuses on the ways in which rural and urban production and urban incomes interact. For the poor urban migrant in a cash intensive environment, HIV and AIDS have the potential to propel them into a downward spiral. As the disease progresses, the migrant loses the capacity to work for cash, which means they are increasingly unable to meet their own basic needs, including food. Often, food consumption may be reduced as cash and savings diminish. The ability of the migrant to engage in urban agriculture is limited due to their loss of energy and poor health. With less cash for survival, the migrant is forced to stop remittances altogether or to reduce amounts sent to the rural extended family, placing that family at risk. If food transfers from the rural household have been reduced, or if food has inferior nutritional quality, the migrant has less access to nutritious food just when their body needs decent nutrition.

These conditions exacerbate malnutrition and poor health and lead to food insecurity. The urban household is forced to use up savings, sell valuables, or borrow money at high interest rates. Dependency on rural and urban based extended family members increases, without the ability to reciprocate. In the context of food insecurity and deprivation, household members are highly likely to engage in risky survival strategies, further exacerbating the HIV and AIDS cycle. As the migrants are further debilitated by AIDS, they are forced to leave the city and return home to the rural areas for continuous care. This relieves pressure on the urban household but places a further burden on the rural one, not only with respect to the burden of care and increased food needs but also with the loss of urban remittances. These models certainly oversimplify a complex set of relationships but they provide a useful starting point for the development of a systematic research programme on urban food security and HIV and AIDS.

Across the SADC region, a new social research and policy agenda on urban food security and HIV and AIDS is beginning to address some of the causal linkages identified in these models. The first set of studies addresses various aspects of the impact of HIV and AIDS on household food

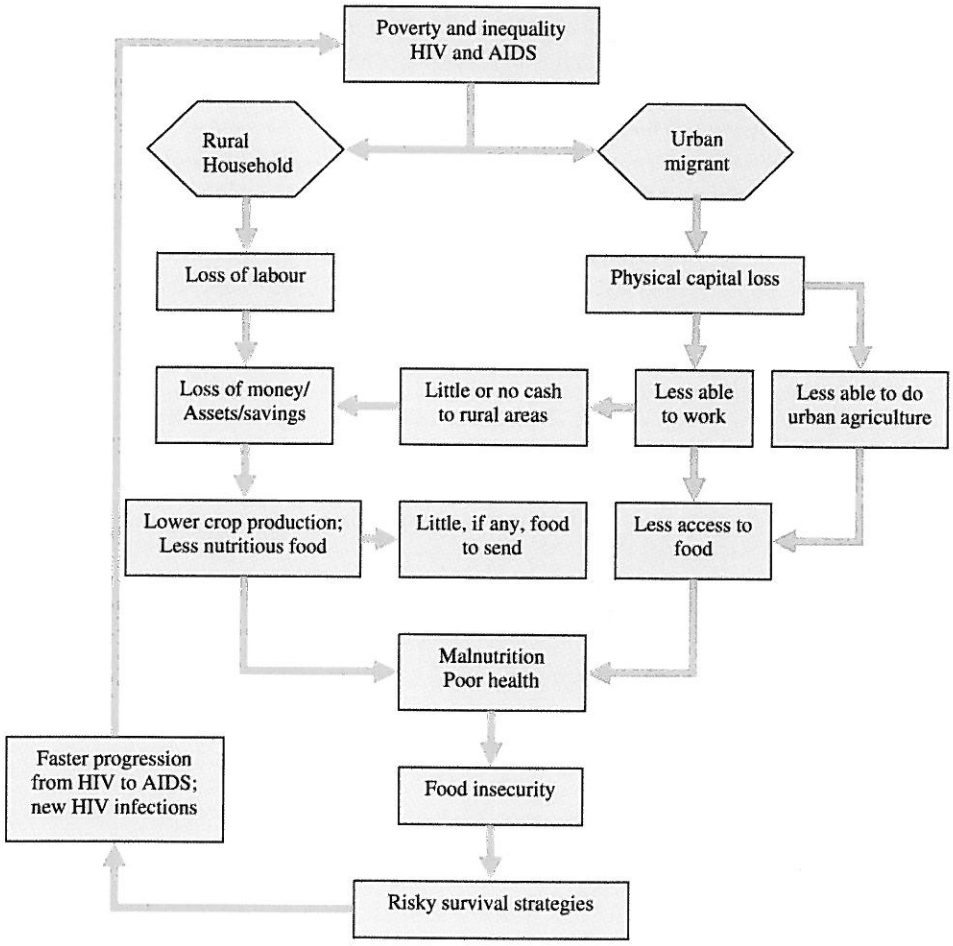

Fig. 7 Rural-urban linkages, food insecurity and HIV. Crush et al. (2007)

security. One study in urban Zambia in the 1990s, for example, sought to determine the socioeconomic impact of adult morbidity and mortality on households (Mutangadura and Webb 1998). A structured questionnaire was administered to 177 residents of Zambia Compound and 168 residents of Kafue Estates. Data revealed that poverty intensified the impact of adult mortality and morbidity in the two sites, particularly in Zambia Compound, where constraints on capital and work opportunities prevented households from diversifying their incomes. Moreover, access to health and adequate sanitation was extremely poor in Zambia Compound. The study recommended programmes intensifying AIDS awareness, strengthening existing community-based initiatives, and providing adequate support and care for orphans and children through community-based interventions.

Another study from the Centre for Social Research at the University of Malawi interviewed PLHIV, chronically ill patients and guardians and urban community members on the impact of HIV and AIDS on labour market participation and household food security (Palamuleni et al. 2003; see also Rajaraman et al. 2006). Among the working cohort, HIV and AIDS-related illnesses resulted in direct household income loss through complete withdrawal from work (over 50% of those interviewed) or through reducing the amount of time they worked. Overall, there was a household income loss of approximately 60%. This increased levels of household food insecurity: as many as 56% indicated that they had stopped sourcing food for their household altogether since they became ill. The study concluded that HIV and AIDS is both a cause and a consequence of food insecurity and poverty in the urban context.

A study in urban Uganda found that HIV/AIDS had made a "devastating contribution" to household food insecurity among affected households (Bukusuba et al. 2007). Income loss and increased medical costs produced various coping mechanisms including eating less preferred foods (95%), reducing portion sizes served to household members (83%), borrowing money or food (77%), skipping meals by all household members (62%) and not eating for the whole day (21%). In other words, while HIV and AIDS increased the need for more food and better diets for PLHIV, it simultaneously deprived the household of the means to meet those needs. Several other case studies have demonstrated the shock to household income, poverty levels and (by extension) food security from HIV-related illness and death (Booysens 2004; Collins and Leibrandt 2007).

Another study, this time of Mutare which is Zimbabwe's fourth largest city, was conducted during a time of high unemployment (60% at the time of the survey), hyperinflation, severe food shortages and the disruptions to livelihoods caused by the Mugabe state's assault on urban informality (Operation Murambatsvina) (Gwatirisa and Manderson 2009; see also Bukusuba et al. 2007). The last destroyed illegal housing in informal urban areas, which led to an increased number of merged households and a greater number of dependants, without increasing the number of people in employment. Against this backdrop, households with PLHIV faced severe problems of ensuring food security. The study revealed that the food and nutritional needs of PLHIV who were chronically ill were often prioritised, leaving other household members without access to food. Households resorted to desperate measures to secure food, especially for ill relatives, selling assets to augment other income and even engaging in a range of "illegal" income-generating activity. Yet disposal of assets only led to deeper poverty for the household. Most households taking care of PLHIV therefore "lived below the poverty datum line and experienced an ever-increasing gap between what was earned and what was spent."

Finally, the World Food Program (WFP), working with the Lesotho Vulnerability Assessment Committee (LVAC), recently issued a report exploring the relationship between urban food security and HIV in that country (LVAC 2009). The urban survey found that 45% of urban households had taken in at least one orphan (the figure was as high as 56% in Thaba-Tseka, a remote town in eastern Lesotho) and 20% of households were looking after chronically ill relatives. In addition, 30% of urban households in Mohale's Hoek—the largest proportion in the country—were highly food insecure. The survey noted that HIV adversely affected a household's food security: caring for a chronically ill family member or orphans put a considerable financial strain on a household that might already be struggling to cope with the loss of a breadwinner.

A second major connection between food security and HIV addressed in the new social research literature agenda concerns the relationship between food insecurity and high-risk sexual behaviour (Weiser et al. 2007). This linkage has often been assumed to exist but had not been satisfactorily backed up with supporting evidence. A recent study in Botswana and Swaziland hypothesized that food insecurity does increase sexual risk-taking—especially among disempowered women living in poverty who are often dependent on others for food and other resources (see also Miller et al. 2010). The study sample included 710 urban women (68% of the female sample) and 618 urban men (62% of the male sample). Women were significantly more likely to report food insufficiency than men in both countries. The study concluded that "food insufficiency was associated with multiple risky sexual practices for women." Women who lacked sufficient food to eat had 80% increased odds of selling sex for money or resources, 70% increased odds of engaging in unprotected sex and 50% increased odds of intergenerational sex. Food insufficiency was a consistent

correlate of sexual risk-taking for women, but not for men. These findings "highlight the strong interplay between gender inequality, food insufficiency, and sexual risk-taking in sub-Saharan Africa." The study concluded that interventions that use targeted food supplementation and food production strategies could help address the gender and economic disparities that drive unsafe sexual behaviours, and should be seen as a way to reduce HIV transmission behaviour in food insecure populations.

A third area of investigation in the new social research agenda has been prompted by the large number of AIDS orphans in Southern Africa. The two key questions are, first, whether AIDS orphans are more vulnerable to food insecurity than other children, and second, whether the presence of AIDS orphans in a household makes it more food insecure. A recent food security survey in Windhoek identified a number of households in which AIDS orphans were living (Ashton et al. 2009). Forty four percent of the households with orphans reported being food insecure (defined as "the inability to access food on a daily basis") compared with 31% for the sample as a whole. However, all of the children said that there was not enough to eat. They reported that they were usually hungry in the morning and went to school without breakfast, or at night they went to bed without supper or only porridge. Many orphans were living with elderly grandparents who themselves had limited incomes. The growth in the numbers of AIDS orphans was clearly having a major impact on the food security of care-giving households whose number was rapidly increasing. In 1991, for example, there were an estimated 27,500 orphans in Namibia of whom fewer than 1% (275) were AIDS orphans. By 2000, the overall number of orphans had grown to 68,000, including 33,000 AIDS orphans. By 2010, the numbers were projected to climb to 206,000 and 161,000, respectively. In Windhoek alone, there were 8,000 orphans in 2001 of whom 4,500 were AIDS orphans. By 2020, these figures are projected to increase to 24,500 and 19,000, respectively.

The fourth area of research concerns the links between urban food security, HIV and AIDS and migration to the city (Crush et al. 2007). A recent report on Johannesburg, for example, compared the situation of internal migrants (who live mainly in informal settlements) and international migrants (who live mainly in the inner-city) (Vearey et al. 2009). Internal migrants were more likely to have experienced food shortages in the previous 12 months (68% versus 56%). Similarly, approximately 65% of internal migrants had a "deficient dietary score" while 60% of international migrants had a "sufficient dietary score." The primary reason for these differences was that internal migrants were significantly more likely to be unemployed (59% versus 44%). The differential impact of the HIV epidemic on the food security of the two groups was also important. Residents of the informal settlement were significantly more likely to report that they felt at risk of HIV infection than those located in the centre of the city.

A related study argues that urban contexts in South Africa present multiple challenges to those responsible for ensuring the good health of urban populations (Vearey et al. 2010). These include urban growth, migration, informal settlements, intra-urban inequalities and—in some cases—high HIV prevalence. The authors argue that attempts to improve the health of urban populations in the context of migration and HIV require a recognition that 'place matters.' HIV presents additional challenges to urban health policy makers and programmers as they must engage with the continuum of HIV related needs, including prevention, testing, support and access to treatment. This also requires urban health officials to ensure that individuals living with HIV are able to access adequate water, sanitation, housing and refuse removal. Place matters when considering the impact of HIV and AIDS on households concentrated in peripheral informal settlements, where access to basic services, healthcare and ART is inadequate.

Finally, there have been some attempts to examine the links between urban agriculture and HIV and AIDS (see RUAF 2005). The Municipal Development Partnership for Eastern and Southern Africa (MDPESA) has suggested that urban food production can contribute to mitigating the effects of the epidemic: "HIV/AIDS-affected families frequently turn to urban agriculture not only to provide food, but also to save cash resources by reducing food and medicine expenditures (by growing their own food and medicinal herbs). It also provides them with an accessible opportunity to earn some income by selling the surplus produce" (Mubvami and Manyati 2007, p. 8). While this seems logical, and worth advocating, the evidence for increased urban agriculture as a response to HIV and AIDS at the household level is fragmentary. The examples from Zimbabwe cited by MDEPSA are all community or NGO-led initiatives which, while important in their own right, do not relieve the need for further research to assess the possibilities and constraints on urban agriculture meeting the food and income needs of HIV-affected households (see Njenga et al. 2009; Karanja et al. 2010). AFSUN's regional survey found that only 20% of households in poor urban communities were growing any of their own food (Crush and Frayne 2010b). Since not all of these households were directly affected by HIV, urban agriculture as a response to HIV is probably not that widespread at present.

Case study evidence of the kind discussed in this section of the paper is extremely valuable in opening up new lines of enquiry, in formulating hypotheses about the links between HIV and AIDS and urban food security and in drawing up policies and planning interventions. These studies also draw attention to the broader social, economic

and development-related impacts of HIV in poor urban communities (Colecraft 2008). However, much more research across the region is necessary on all of these issues as food insecurity varies considerably from city to city, and within cities, right across the region.

Conclusion

This paper began with the assertion that we know far more about the rural impacts of HIV and AIDS on food security than the urban impacts, despite the fact that rates of HIV are generally higher in urban areas. Our knowledge of the negative impacts of the epidemic on rural smallholder production is now considerable. However, these findings are of less value for understanding the urban food security impacts of the epidemic as few urban residents depend exclusively or predominantly on agriculture for their livelihoods.

When rural production declines because of the epidemic, there will be a carry-over effect in some urban areas. Where urban households receive informal food transfers from the countryside, for example, a decline in production could reduce food transfers and increase urban food insecurity. AFSUN's 2008-9 survey of household food security in 11 SADC cities found that 28% of poor urban households had received food transfers in the previous year (Crush and Frayne 2010b). This varied considerably from city to city. In some, such as Windhoek, Lusaka and Harare, the proportion was over 40%. Reduced food transfers because of HIV and AIDS could certainly affect the food security of poor urban households in Namibia, Zambia and Zimbabwe.

The amount and regularity of household income are the critical determinants of food security in the urban context. When a steady or sufficient income stream is absent, households quickly become food insecure. They eat less, eat less well, sacrifice dietary diversity and rely more on foods high in sugar and carbohydrates. The result in many of the poorer urban neighbourhoods of Southern Africa is an epidemic of undernutrition. Rapid urbanization in the last two decades has dramatically increased the absolute numbers of people in this situation. This means, in effect, that the absolute numbers of people who were in a nutritional state that made them particularly vulnerable to the progress of HIV was growing rapidly even as the virus itself began its inexorable spread. Certainly, the rapid spread and devastating impact of HIV has been exacerbated by hypermobility, mass urbanization and undernutrition. Neither mobility nor urbanization is likely to slow in the coming years. This leads to an obvious conclusion: food insecurity and HIV and AIDS are already locked in a vicious circle whose worst impacts can only be mitigated by ART and improved access to a rich, varied and adequate diet for all. In this context, more assessments and evaluation of the urban impacts and effectiveness of national nutrition programmes and social protection programmes (e.g. child grants, disability grants, pensions, food banks) on HIV-affected households and communities are required (see, for example, Kennedy and MacIntyre 2003).

A consortium of international organizations recently argued that adequate nutrition is necessary to maintain the immune system, manage opportunistic infections, optimize response to medical treatment, sustain healthy levels of physical activity, and support optimal quality of life for PLHIV (World Bank 2007). They also noted that nutrition interventions can help to optimize the benefits of antiretroviral drugs (ARVs) and may increase compliance with treatment regimens, both of which are essential to prolonging the lives of PLHIV and to preventing the transmission of HIV from mother to child. Their lengthy list of "what we can do" elaborates a whole suite of nutrition-based interventions. Nutrition support is proposed for PLHIV, HIV-positive pregnant and lactating women, infants and young children born to HIV-positive women, HIV-positive infants and young children and PLHIV on ART. The manual also proposes that in emergency situations, the nutritional needs of HIV-positive individuals should be prioritised. The recommendations are sound and comprehensive and should be seriously considered as priority interventions for Southern African cities.

While the implementation of these proposals would bring relief to PLHIV, the manual does not ask how the broader social and economic inequities that put so many people at risk are to be addressed. Nor does it say very much about the needs of those whose nutrition and food security is negatively impacted by HIV and AIDS, though they themselves may not be infected. The manual's solutions are framed purely in nutritional terms and on nutrition-based interventions that only target PLHIV. Yet, the presence of a PLHIV in the household changes the food and nutrition security of the whole household and may ripple out into the community (Gillespie and Kadiyala 2005; Pedi and Renzaho 2006; Oldewage-Theron et al. 2006; Panagides et al. 2007; Himmelgreen et al. 2010). If a PLHIV is no longer able to work, reduced household income and increased medical costs follow. In other words, HIV and AIDS not only has a negative impact on the nutritional status and requirements of the individual, but places additional demands on other household members and can make everyone more food insecure.

Much of the health sector research on the HIV-Food Security nexus focuses somewhat narrowly on nutrition. But nutritional needs and dietary quality and diversity are only one component of food security in the urban context. A broader approach is needed which encompasses all aspects of food security—availability, accessibility, appropriateness and reliability, as well as quality—and their relationship with HIV and AIDS. Nutritional and biomedical

research on the immediate impact of HIV and AIDS on health also needs to be "reframed" within an approach that identifies underlying causes of food insecurity and HIV vulnerability. These structural problems (such as rapid urbanization, poverty, unemployment, overcrowding and gender-based violence) may seem more intractable but they cannot be ignored in the search for sustainable solutions.

In order to develop workable urban-specific, evidence-based actions, more knowledge is urgently needed on a number of issues including: (a) the nutritional burden on HIV-affected and non-HIV affected households in otherwise similar socio-economic circumstances; (b) the extent to which food insecurity leads to behaviours that increase vulnerability to infection; (c) the impacts on household income, food security and nutritional status of losing an income earner through illness or death; (d) the dietary challenges and coping strategies adopted by households with PLHIV; (e) the extent to which household and community food production can reduce the nutritional burden of HIV on affected households and (f) popular perceptions of the relationship between HIV and nutrition in the urban setting since certain foods have been widely touted by politicians, most notably South Africa's former Minister of Health, as a remedy for HIV. Such nutritional misinformation is just one legacy of a decade of AIDS denialism in South Africa (Bentley et al. 2005; Nattrass 2007; Chigwedere and Essex 2010).

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