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EFFECTIVE FOOD AND NUTRITION POLICY RESPONSES TO HIV/AIDS: WHAT WE KNOW AND WHAT WE NEED TO KNOW

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ABSTRACT

The impact of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) on people's lives and on development is staggering. Millions have died and livelihoods have been devastated, particularly in Sub-Saharan Africa. Agriculture and natural resources are important components of such livelihoods. And the nutritional status of those infected and affected plays a large part in determining their current welfare and their ability to further develop their livelihoods towards activities that help to mitigate the impacts of AIDS and prevent the spread of HIV.

This paper first reviews the potential pathways through which HIV/AIDS affects assets and institutions generally and then the specific impacts on agriculture, natural resource management, food security, and nutrition. The impacts on agriculture and resource management revolve around how to deal with labor and knowledge losses and institutional weakening. With regard to nutrition, HIV/AIDS significantly impacts individuals and households—through accelerating the vicious cycle of inadequate dietary intake and disease, and through diminishing the capacity to ensure the essential food, health, and care preconditions of good nutrition.

The review addresses the question of how the public sector can and should respond to these challenges. The focus is primarily on mitigation, though the authors note that effective mitigation can also serve as a very cost-effective form of prevention. Communities must be actively involved not only because they have the most information about how their own livelihood constraints have changed due to HIV/AIDS but also as a

way of overcoming stigma. The potential impact of the public response needs to be evaluated, both in terms of mitigation today as well as with regard to the reduction of susceptibility and vulnerability tomorrow. New interventions to address HIV/AIDS mitigation should only be developed if existing agriculture, food, and nutrition interventions areas cannot be effective by adapting them though the use of an HIV/AIDS "lens." Public policy should not be blind to HIV/AIDS but neither should it be blinded by it.

As labor becomes depleted, new cultivation technologies and varieties need to be developed that do not rely so much on labor, yet allow crops to remain drought resistant and nutritious. As knowledge becomes depleted, innovations such as farmer field schools have to emerge to facilitate the transfer of community-specific and organization-specific knowledge within generations and across them.

Nutritional support has the potential to significantly postpone HIV/AIDS-related illness and prolong life. Regarding mother-to-child transmission of HIV, further confirmation of the protective effect of exclusive (as opposed to partial) breastfeeding is needed to strengthen existing policy. Appropriate community-based interventions aimed at improving the food, health, or care preconditions of nutritional well-being need to be designed through a participatory process of assessment, analysis, and action.

Finally, the review outlines five research priorities. These comprise the development of mechanisms for information sharing and for the assessment of capacity; the evaluation of attempts at HIV/AIDS mitigation through food, agriculture, and nutrition interventions, and more basic research on the dynamics of shocks. Finally, a

reexamination of the policymaking process is needed to understand the ways in which existing policies and programs may be modified to reduce their effects on either the spread of HIV or the downstream impacts of HIV/AIDS on households and communities.

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1. INTRODUCTION

Every person on this earth is a person living with AIDS.[1]

In the countries of Sub-Saharan Africa that have been hardest hit by HIV/AIDS, life expectancy is lower today than it was 20 years ago.[2] To say that AIDS has decimated the adult population of many of the countries in the region is a literal understatement. In at least 14 countries in the region, more than one adult in ten is living with HIV/AIDS. But HIV/AIDS is not confined to this part of the world. It is increasingly casting a shadow over the development of Asia and Latin America. India, for example, already has more individuals living with HIV/AIDS than any other country in the world, with the exception of South Africa. The harsh experiences from one region must be shared with other regions before it is too late.

HIV/AIDS has multiple, wide-ranging impacts, from individual to national levels. The grim progression from infection to death is summarized in Box 1. For individuals that cannot afford anti-retroviral drugs, HIV infection leads to a premature death from AIDS. For households and communities, the aggregated impacts of HIV/AIDS morbidity and mortality may threaten their very existence. And for many affected countries,

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[1] Quote from a plenary address to the July 2000 International AIDS Conference in Durban, South Africa.

[2] This set includes Botswana, Côte d'Ivoire, Kenya, Malawi, Tanzania, Uganda, Zambia, and Zimbabwe.

Box 1—From HIV to AIDS

Acquired immunodeficiency syndrome (AIDS) was first identified over 20 years ago. Since then, scientists not only have identified the human immunodeficiency virus (HIV) that causes AIDS, but also now understand many of the stages in transmission. HIV is transmitted from person to person in the developing world predominantly through heterosexual intercourse. After transmission, HIV infection generally follows a common pattern in all regions of the world, although the interval between phases may be shorter in developing than in industrialized countries (Bartlett and Finkbeiner 1998). These phases are

1. *Acute infection*: HIV causes symptoms of acute infection (such as fever and body ache) that clear up spontaneously, generally within 1 to 6 weeks after infection. Concentration of the virus in the blood, also known as viral load, is high at this time. If a women is pregnant or breastfeeding at the time of infection, the risk of mother-to-child-transmission (MTCT) of HIV is greater due to the high viral load. This phase of infection usually lasts between 1 and 3 weeks;

2. *Seroconversion*: An individual undergoes seroconversion when the body begins to produce antibodies to HIV. Seroconversion generally takes place 6 to 12 weeks after HIV infection. HIV antibodies can be measured through a blood test; a positive antibody test confirms that adults are HIV infected. However, infants born to HIV-infected mothers still carry their mothers' antibodies, even if the infants themselves are not infected. These maternal antibodies may remain in their bodies for 12 to 15 months. For this reason, standard HIV antibody tests cannot confirm HIV infection in infants younger than 12 to 15 months of age;

3. *Asymptomatic period*: In most cases there is usually a prolonged period (several years) when an infected person feels well and has no symptoms of infection. During this period, the infected individual's immune system is gradually affected by the disease. The effect of HIV on nutrition begins during this asymptomatic period;

4. *Early symptomatic infection*: During this period, the first symptoms of a weakened immune system occur. Common conditions include fungal infections of the mouth and other mucosal surfaces (e.g., oral thrush), shingles, excessive bruising and bleeding, bacterial (pneumococcal) pneumonia, tuberculosis, chronic fatigue, fever, weight loss, and chronic diarrhea. These conditions tend to persist for several weeks or months in people living with HIV;

5. *Late symptomatic infection*: This stage officially constitutes the condition called AIDS and it is defined by a blood test that confirms a low number of immune cells or by the presence of various other severe complications. The HIV viral load, and the risk of transmission, is high during this stage because the immune system is not able to control the infection.

In industrialized countries, the average length of time between HIV infection and AIDS diagnosis is 8 to 10 years. In developing countries, this time period and the time between AIDS diagnosis and death may be shortened by exposure to pathogens and infectious diseases, poor health care, and malnutrition (Grant, Djomand, and DeCock 1997; Morgan et al. 1997; Greenberg et al. 1998).

Source: Piwoz and Preble (2000).

HIV/AIDS is reversing economic growth.[3] The scale and velocity of the pandemic, and its wide-ranging, catastrophic effects are, however, finally challenging the forces of denial and parochialism. An increasing number of influential individuals and organizations view HIV/AIDS as a global development problem.

Agriculture remains an important component of the livelihoods of the majority of poor individuals who live in the countries that are worst affected by HIV/AIDS. Their nutrition status plays a large part in determining their current and future ability to further develop their livelihoods towards activities that help to mitigate the impacts of AIDS and prevent the spread of HIV. For these reasons this review addresses the following question: *How should governments begin to conceptualize policies in the area of food security, nutrition, agriculture and the environment to better meet the needs of the poor within the context of the HIV/AIDS pandemic?*

Following an update on the spread of HIV/AIDS, we briefly describe what we know and what we do not know about the nature and magnitude of HIV/AIDS impacts at different levels in society as well as the private responses that attempt to soften those impacts. We then consider the public policy and programmatic implications of such impacts and private responses in the areas of agriculture, food, and nutrition. The

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[3] Few estimates exist of the impacts of HIV/AIDS at the macroeconomic level. Using a basic cost-accounting methodology, Anand, Pandav, and Nath (1999) estimate that for India, where the percent of adults living with HIV/AIDS is estimated to be 0.7 percent, the costs of HIV/AIDS are equivalent to 1 percent of GDP. They conclude that this estimate is likely to be a lower bound, given the omission of various cost categories from the calculation. Using data from 60 developing countries and cross-country regression techniques, Bonnel (2000) estimates that for the countries of Sub-Saharan Africa as a whole, HIV/AIDS reduced GDP per capita growth by 0.7 percent, a rate that is nearly twice the level of growth actually achieved (0.4 percent). New estimates for South Africa from Arndt and Lewis (2000) suggest that GDP per capita drops 8 percent by 2010 under a "business as usual" scenario.

concluding section outlines a research and communications program necessary to overcome information shortfalls.

THE MAGNITUDE OF THE HIV/AIDS PANDEMIC

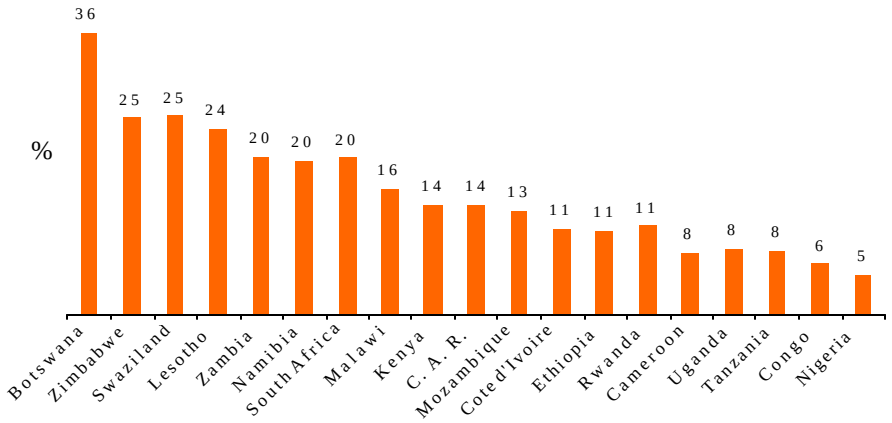
Over 36 million individuals are currently living with HIV/AIDS, 95 percent of whom are from developing countries. Assuming that each HIV/AIDS case directly influences the lives of four other individuals, a total of more than 150 million people are being affected by the disease (Barnett and Rugalema 2001). Sub-Saharan Africa is the region most affected, where HIV/AIDS is now that area's leading cause of adult morbidity and mortality (see Table 1 and Figures 1 and 2). Most, if not all, of the 25

Table 1—HIV/AIDS by region, December 2000

Region	Epidemic started	Adults and children living with HIV/AIDS	Adults and children newly infected with HIV	Adult prevalence rate in percent	Percent of HIV-positive adults who are women
Sub-Saharan Africa	Late 1970s - early 1980s	25,300,000	3,800,000	8.80	55
North Africa and Middle East	Late 1980s	400,000	80,000	0.20	40
South and Southeast Asia	Late 1980s	5,800,000	780,000	0.56	35
East Asia and Pacific	Late 1980s	640,000	130,000	0.07	13
Latin America	Late 1970s - early 1980s	1,400,000	150,000	0.50	25
Caribbean	Late 1970s - early 1980s	390,000	60,000	2.30	35
Eastern Europe and Central Asia	Early 1990s	700,000	250,000	0.35	25
Western Europe	Late 1970s - early 1980s	540,000	30,000	0.24	25
North America	Late 1970s - early 1980s	920,000	45,000	0.60	20
Australia and New Zealand	Late 1970s - early 1980s	15,000	500	0.13	10
Total		36,100,000	5,300,000	1.10	47

Source: http://www.unaids.org
Notes: Adulthood is 15–49 years of age.

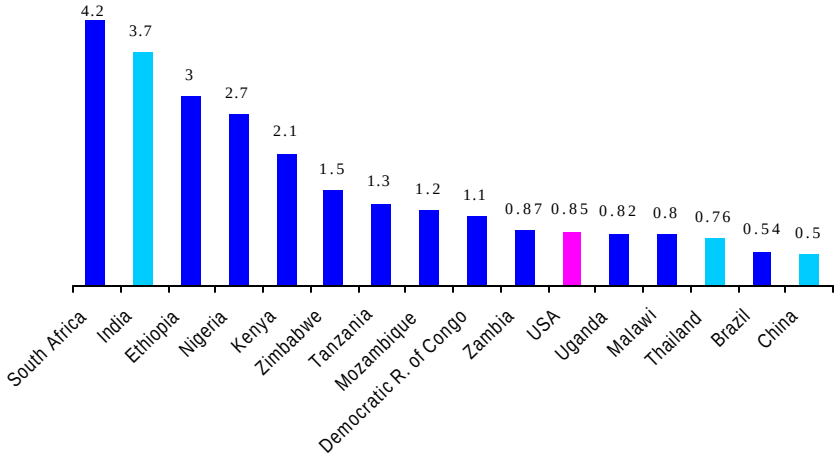
Figure 1—Estimated percent of adults (15-49 years) living with HIV/AIDS, end 1999



Source: www.unaids.org

Note:Highest rates from other regions: Haiti (5.2), Bahamas (4.13), Cambodia (4.0), Thailand (2.2). The US rate is 0.6.

Figure 2—Estimated millions of people living with HIV/AIDS, end 1999



Source: www.unaids.org

million people in Sub-Saharan Africa who are living with HIV/AIDS will have died by the year 2020, in addition to the 13.7 million Africans already claimed by the epidemic.

HIV/AIDS also is spreading dramatically in Asia. India is estimated to have 3 to 5 million HIV infections and, though national data are not reliable, some Chinese specialists estimate up to 10 million HIV infections in China. Asia will overtake Sub-Saharan Africa in absolute numbers before 2010 and by 2020, Asia will be the HIV/AIDS epicenter (Barnett and Rugalema 2001).

HIV/AIDS IS A UNIQUE SHOCK

The HIV/AIDS pandemic is transforming the landscape upon which development must take place in much of the developing world. Like other infectious diseases that become epidemic, HIV starts out as an idiosyncratic shock that turns into an aggregate shock. But why is it different from other infections or shocks? There are several reasons:

- It is incurable and fatal. This bleak prognosis makes intervention efforts (prevention or mitigation) difficult. Most development interventions can offer some hope of some improvement in human welfare. Effective HIV prevention can only offer an absence of decline. Effective HIV mitigation can only offer a temporary improvement in human welfare from an already HIV/AIDS-lowered level. Certain premature death also undermines the incentive to accumulate assets due to a heavily discounted future;

- Life-prolonging treatment is too expensive for most HIV-infected people, although there is significant scope for major cuts in the prices of drugs (affordability and access are major issues of current ethical debate);
- It is socially and physically invisible. The private nature and divergent cultural attitudes towards sex tend to lead to silence, denial, stigma, and discrimination at many levels. This makes effective prevention and mitigation difficult to implement;
- HIV is a "lentivirus" with a very long incubation period between infection and full-blown symptoms during which individuals are infective. In the absence of routine HIV testing, infected individuals have less of an incentive to alter risky behavior and a long period over which to undertake those activities. Both invisibility and long duration increase chances of HIV transmission. Individuals who are unaware of their HIV status and their families cannot begin to alter livelihood strategies in response to the coming shock;
- It kills the most productive members of society, thus increasing household dependency ratios, reducing household productivity and caring capacity, and impairing the intergenerational transfer of local knowledge and skills;
- "Coping" strategies are more likely to be irreversible, compared to other shocks. The very survival of the household unit is threatened;
- It has both rural and urban dimensions. As with poverty, the death of one or more income-earners in rural households often forces survivors to migrate to seek work

in cities. A death of an urban worker may force survivors to send children back to rural extended families to be cared for;

- It affects both the rich and the poor, though it is the poor who are most severely exposed and most severely impacted (see the next section below);
- It affects both sexes but is not gender-neutral. To the extent that women are marginalized and powerless, they are more at risk of being exposed to HIV. Women are also more likely to succumb rapidly to HIV/AIDS, as they are more biologically vulnerable (see discussion below);
- Finally, one of the most disturbing aspects of the pandemic is the fact that, as the pandemic intensifies with a parallel need for action, the actual *capacity to act* is decreasing, as individuals in the government and nongovernmental organization continue to die. The capacity gap—between what is needed and what can be delivered—is becoming an abyss.

THE POVERTY DIMENSION

In general, poverty increases the exposure to, as well as the impact of, HIV. It diminishes the perceived value of avoiding HIV ("we will die soon anyway"), it increases the relative costs of both avoiding and treating the illness, and it exacerbates the impact of weakened immunological integrity as a result of a more hostile bacterial and viral environment. Poverty also increases the radius of impact of HIV on family and friends (for the poor, informal coping mechanisms are more dependent on family and friends and less so on insurance companies and the state).

In the reverse direction, HIV/AIDS also impoverishes. It increases poverty in the short to medium run by stripping assets of many kinds—human, social, financial, physical, natural, informational, and political—as described in Section 2. Asset rundown leaves individuals, families, and communities more exposed to future shocks—children are pulled out of school to help with labor needs and young women may be forced to become commercial sex workers.

Nevertheless, as compared to other aggregate shocks, the nonpoor are thought less able to avoid HIV infection and its impacts. While this might generate wider political support to confront AIDS, it undermines the ability of middle income-staffed governments, private-sector firms, and other formal organizations to mobilize resources to combat it. There is also a danger that public-sector health budgets will become more skewed towards the wealthier and the more vocal urban HIV/AIDS population to the detriment of the rural poor in general. Primary health care clinics may become increasingly poorly equipped. Waiting and travel times for the poor might also increase as a consequence, further stretching the demands on the remaining able-bodied labor.

THE GENDER DIMENSION

Women are biologically, socioeconomically, and socioculturally more at risk of HIV infection than men (see Rao Gupta 2000 and Topouzis 2000). Biologically, the risk of becoming infected with HIV during unprotected vaginal intercourse is between two and four times higher for women than for men (World Bank 1997). Women are also more susceptible to other sexually transmitted diseases (STDs) and less likely to seek

treatment. If untreated, STDs may multiply the risk of HIV transmission by 300–400 percent. Such biological susceptibility further threatens reproductive health status; pregnancy and child-bearing now involve considerably greater risks not only to the women but to their future offspring, while STDs can be potentially life-threatening.

HIV/AIDS also exacerbates social, economic, and cultural inequalities that define women's status in society, and render them more vulnerable to HIV infection and AIDS impacts than men. There are several aspects of such vulnerability:

- a culture of silence and passivity regarding sex, which stigmatizes women who try to access STD treatment services;
- the norm of virginity restricts adolescent girls' access to information about sex, and increases risk of sexual coercion;
- economic vulnerability increases chance of exchange of sex for food, money, etc;
- male power manifested in sexual violence;
- sexual practices, including genital cutting, dry sex, ritual cleansing;
- widow inheritance;
- where men have full rights over children following marriage, women will often endure the heightened risk of HIV infection from an unfaithful husband rather than divorce him.

PREVENTION, MITIGATION, AND CARE

Neither a vaccine nor a cheap, assured, and effective treatment for HIV/AIDS exists. The focus therefore needs to be on *preventing* HIV infection and *mitigating* the impacts of HIV/AIDS. Conventionally the distinction is made between prevention aimed at reducing HIV infection through behavioral change, and mitigation aimed at reducing the severity of HIV/AIDS impacts on households, communities, and other institutions (see Figures 3 and 4).

But this over-simplifies the situation inasmuch as successful mitigation efforts can be preventive, too. To the extent that poverty increases HIV/AIDS susceptibility and vulnerability (see previous discussion), mitigation that succeeds in alleviating or preventing poverty can reduce HIV exposure and future impacts. Poverty and livelihood programs that operate through an HIV/AIDS lens may do so even more effectively.

Another area of focus is *care*—care for those infected and affected, including the children of HIV-infected parents, orphans, widows, etc. Care is considered here as being inextricably linked with mitigation; care clearly mitigates individual-level impacts, and other forms of mitigation may improve the capacity to care within households and communities.

While the primary focus of this paper is on mitigating HIV/AIDS impacts on livelihoods, and food and nutrition security, approaches to behavioral change to prevent HIV infection are briefly discussed here.

Figure 3—HIV/AIDS mitigation: A conceptual framework

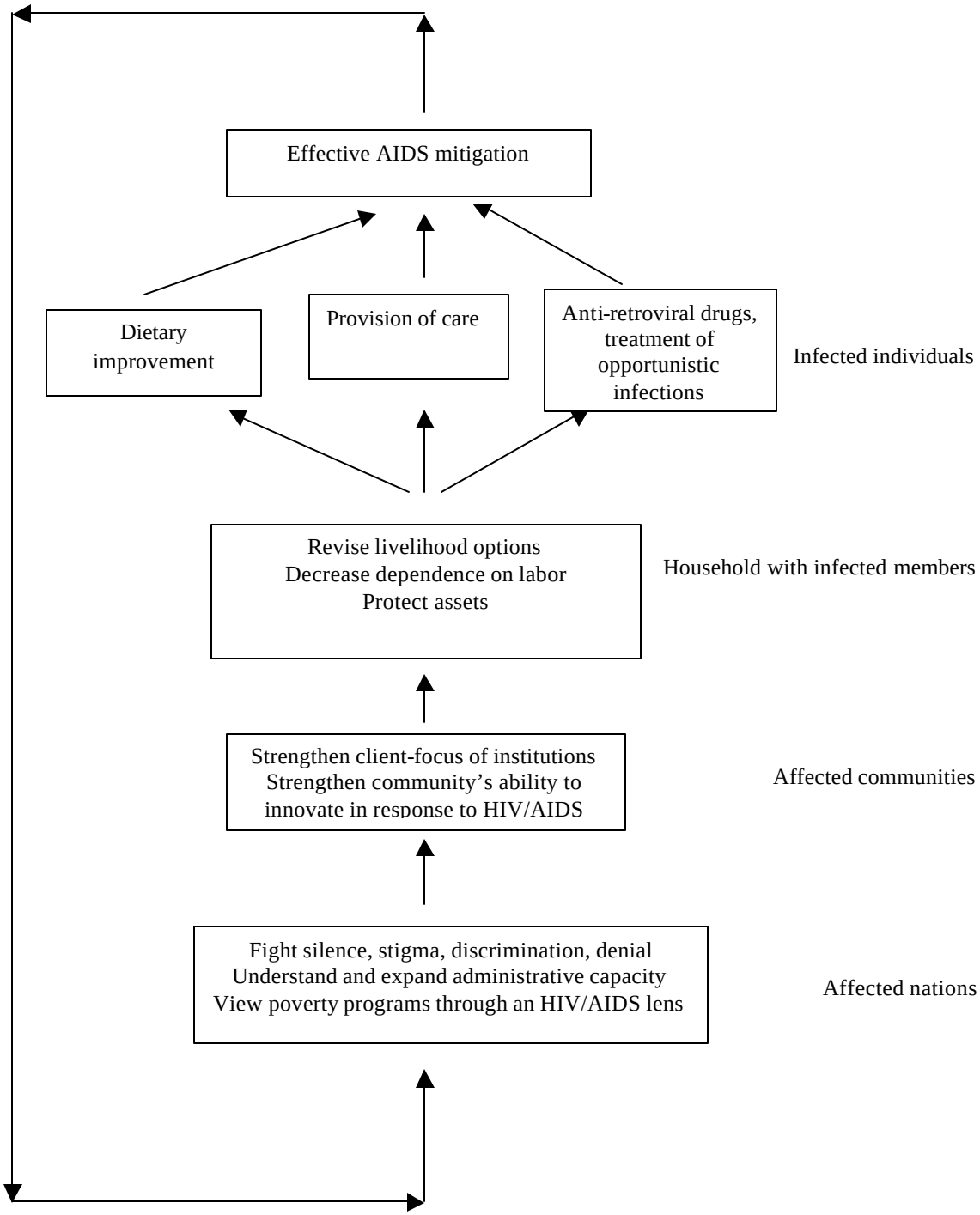
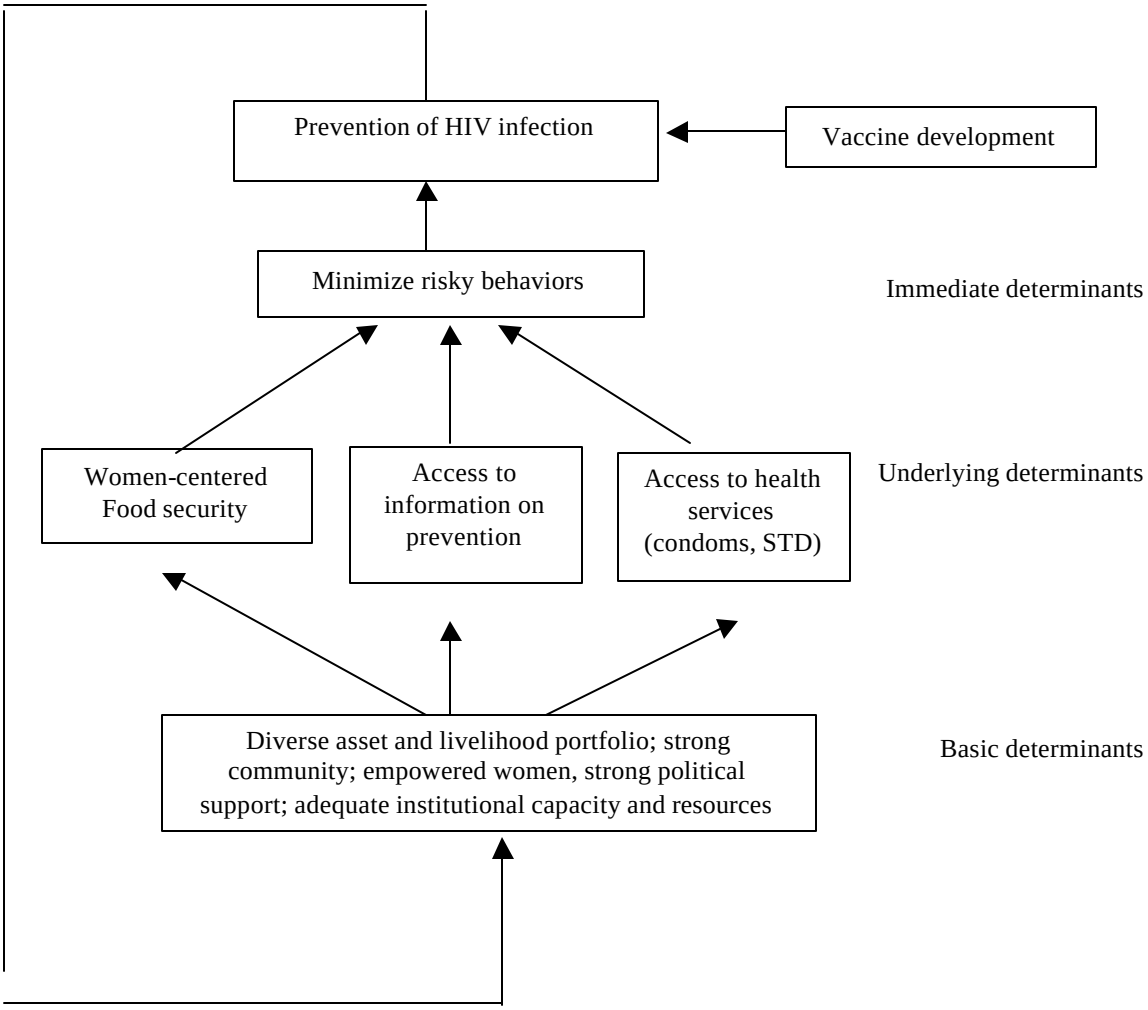


Figure 4—HIV prevention: A conceptual framework



Irrespective of the discovery of an AIDS vaccine, prevention needs to focus on shutting down the engine of growth of the infection, namely minimizing the risky behaviors of individuals who are most likely to catch and spread the disease. But changing the behavior of individuals is about much more than access to information and services, and cajoling and exhorting. It is also about the incentives—cultural, social, and

economic—that lead individuals to a highly risky course of action as opposed to a less risky one. The consensus view now recognizes the importance of poverty as a factor in the implicit cost-benefit calculations made by those contemplating such risky behaviors. If we can identify certain types of livelihoods as being more prone to result in HIV infection, then policy can begin to provide incentives for individuals to switch to less risky livelihood choices.

A major controversy surrounding mitigation has focused on access to the poor of anti-retroviral drugs. Mitigation, however, is about much more than this. Access to affordable and effective health care to combat the opportunistic infections that AIDS invites is essential, as is adequate care for those infected with AIDS. Mitigation is also about creating environments that support those who are affected but not infected by HIV/AIDS, namely their families, households, and communities. As with HIV prevention, some livelihood strategies are better than others in supporting HIV/AIDS mitigation. As we begin to better understand the social and economic impacts of HIV/AIDS, the features of livelihoods that allow more effective mitigation can be identified.

The broad parameters of effective prevention and mitigation are well understood, but the details of what works and why, less so. This is probably due to at least three sets of factors. First, a general atmosphere of silence, stigma, discrimination, and denial—a tone often set by the official government media—deters experimentation in combating HIV/AIDS. Second, the research community has been slow to undertake operational work that records, evaluates, and disseminates various prevention and dissemination

efforts. Third, a community-based approach to assessment, analysis, and action that is common in several fields, such as poverty and malnutrition reduction, is less present in HIV/AIDS programming.

2. IMPACTS OF HIV/AIDS ON LIVELIHOODS[4]

> *How to achieve the sustainable development essential for an effective response to the epidemic under conditions where the epidemic is destructive of the capacities essential for the response?* (Cohen 2000).

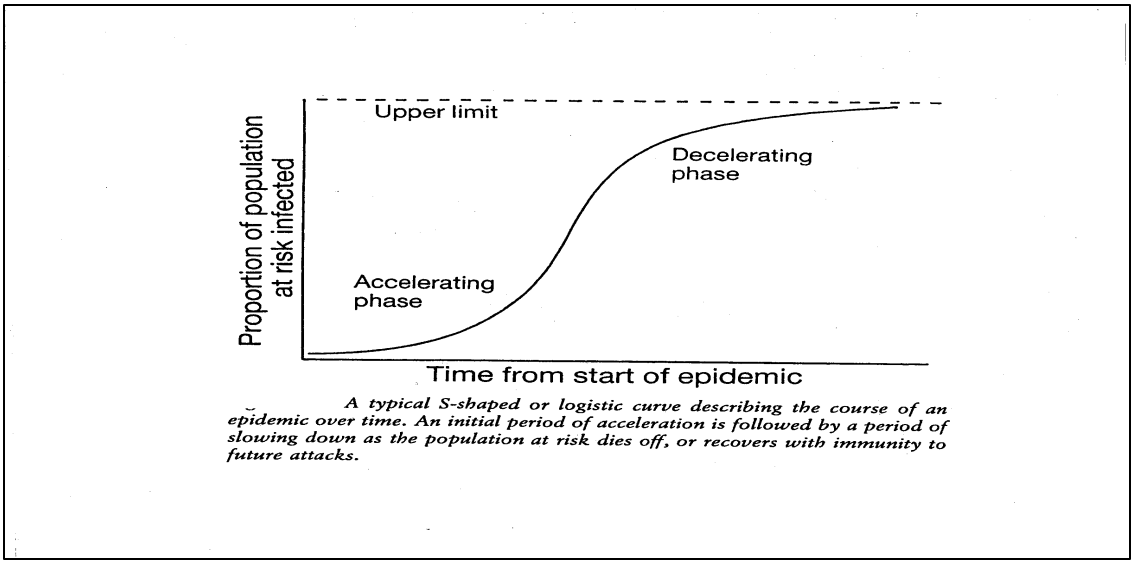
There are three points to be made at the outset of any discussion of livelihoods and HIV/AIDS impacts. First, impacts are often revealed through the responses, or "coping strategies," made by households and communities. However, the term "coping" may not always be accurate, simply because many responses are those of distressed households that are not coping. Coping implies a reversible management strategy. It also somehow suggests that the adoption of such strategies is not too costly. The reality is that many households are forced to make distress sales or change livelihood strategies in ways that are irreversible. The price of such short-term "coping" may be long-term deprivation or even destitution. In this paper, we therefore prefer to use the term "responses" rather than "coping."

[4] This section draws on many of the reviews and studies cited in the bibliography without always explicitly citing them. Of particular importance are those by White and Robinson (2000), Topouzis (2000), Barnett (1994), Mutangadura, Mukurazita, and Jackson (1999), and Rugalema (1999a).

Second, it is important to differentiate susceptibility to HIV infection—that is, the likelihood of becoming infected with the virus—from the vulnerability to the different types of impacts, once infection has taken place.

Third, it is important to recognize that different stages of the HIV/AIDS epidemic will have different indicators, different impacts, and different responses. Epidemics evolve in a stylized way as depicted in Figure 5.

Figure 5—The evolution of an epidemic



A typical S-shaped or logistic curve describing the course of an epidemic over time. An initial period of acceleration is followed by a period of slowing down as the population at risk dies off, or recovers with immunity to future attacks.

There are also differences between countries or subnational regions with regard to the gradient and the peak prevalence of the HIV/AIDS epidemic curve, relating, in part, to the velocity of transmission, which itself is related to behaviors and the pathogenicity of the particular HIV strain.

How, then, is HIV/AIDS thought to affect livelihoods? In terms of livelihood outcomes, we focus on food security and nutrition. A livelihood represents the interaction between assets and transforming processes and structures that generate a means of living, all conditioned by context that individuals find themselves in (Carney 1998). We first examine the hypothesized impacts of HIV/AIDS on assets and the actual impacts whenever the evidence permits. We then focus on the transforming structures and processes, including impacts on institutions, incentives, policies, and laws. Finally, we examine the impact on food security and nutrition.

IMPACTS ON ASSETS

HIV/AIDS strips individuals, households, networks, and communities of assets.

Human Capital

Most obviously, HIV/AIDS attacks human capital. Infected individuals eventually die prematurely. Living but infected individuals are rendered less productive once AIDS emerges, due to a series of opportunistic infections, of which tuberculosis is the most frequent. A scale of the impact on mortality and morbidity is given by numbers on disability-adjusted life years (or DALYs) (Murray and Lopez 1996). At a global level, HIV/AIDS was twenty-eighth in terms of causes of DALYs in 1990, and is projected to be tenth in 2020. In Sub-Saharan Africa HIV/AIDS is projected to be the third leading cause of DALYs in 2020 (from seventh in 1990) and for India, HIV/AIDS is also projected to be the third leading cause in 2020 (from very low down the list in 1990).

These figures, dramatic as they are, do not capture the full impact of HIV on labor in terms of livelihood generation, because the labor of healthy individuals is diverted into other crucial activities, such as caring for those infected and attending the funerals of those who have died. The measured impact of these changes in demographic profile on household dependency ratios is inconclusive. This may reflect the household or community's response to the shock in terms of "importing" prime-age labor and "exporting" children via family or informal nonfamily networks (White and Robinson 2000). These labor movements may entail costs to the children in terms of the quality of care provision and may exacerbate the spread of HIV/AIDS if the "imported" labor comes from heavily infected areas. These are areas for further research.

But human capital is about much more than manual labor. It is also about knowledge. The striking-down of adults in their prime by HIV/AIDS severely abbreviates the ability of individuals to transfer knowledge both within their generation and from their generation to the next. Both verbal and role model mechanisms are interrupted by HIV/AIDS. New generations are less able to draw on the body of knowledge that dies along with their parents and they are deprived of "learning by doing" under the guidance of someone more experienced.

The ability to acquire and use information is also impaired by HIV/AIDS as younger generations are pulled out of school to bolster the family's ability to provide care to the ill and to maintain its current livelihood, or develop new ones. This is an example of an ultimately destructive "coping strategy." Tomorrow's livelihoods are being sacrificed in order to hang on to today's.

Financial Capital

Financial capital is damaged by HIV/AIDS in a number of ways. Because drug, burial, and related transport expenses become major items in budgets, families need to find ways to maintain current consumption levels. In terms of financial capital services (credit, savings, and insurance), poor families either have to sell stores of value (e.g., jewelry and livestock), assets (e.g., equipment or tools), borrow funds in a sustainable manner, or—which seems most unlikely—have access to some kind of insurance, health, or otherwise.

The poor invariably are reliant on informal credit at high interest rates or on group-based microfinance products. Unfortunately, both of these types of services tend to be spatially concentrated and, hence, vulnerable to aggregate shocks. Even when the epidemic is in its early stages, the infected family is less able to avoid default and, hence, is less attractive to group-based liability schemes. Despite these limitations, private credit has been described as the key distress response to adult death from HIV/AIDS—at least in the well-studied area of Kagera in Tanzania (Lundberg, Over, and Mujina 2000). No doubt the ability of microfinance institutions to respond to the changing needs of their clients will be crucial to HIV/AIDS mitigation efforts. We will return to this subject in Section 3.

Social Capital

Social capital—or the strength of associational life, trust, and norms of reciprocity—may be undermined by HIV in several ways. First, social reproduction in

terms of the role modeling of norms of trust and good citizenship is impaired. Future generations not only do not witness farming practices, they also do not experience the informal exchanges of knowledge, tools, and animal draught labor that are often embodied in such livelihood activities. Second, the incentives for coordinated group action may be diminished due to the heavy discounting of the future benefits of such action. This has a particularly negative consequence for natural resource management practices that are dependent on collective action, such as integrated pest management, social forestry, and watershed development (Knox, Meinzen-Dick, and Hazell 1998). Third, the formal institutions that also contribute to social capital formation, such as church groups, sports clubs, and professional associations, are likely to be weakened as members die. Fourth, social networks tend to be spatially concentrated. The networks that are more heterogeneous should have a greater carrying capacity. However, members who are highly mobile or who live in urban areas will make a network more susceptible to HIV/AIDS. Fifth, social capital may be weakened through an increased exclusiveness of network membership. The stigma attached to HIV/AIDS is not conducive to the establishment of crosscutting ties across the different strands of social capital (Narayan 1999). HIV/AIDS might lead to the generation of a type of social capital formation that is good for those intimately involved with a network but which has negative externalities for nonmembers (i.e., through exclusion). One final point to note is that social networks might be strengthened initially by the threat of the large-scale epidemic. Collective action might be stimulated in the face of a community-wide threat before that threat begins to

undermine the ability and incentive to act collectively. The strength of social capital networks to stand up to sustained aggregate assault is an area that needs more attention.

Physical Capital

The basic infrastructure and productive equipment that are relied upon for the pursuit of livelihoods also comes under threat due to HIV/AIDS. The possible sale of productive equipment or mortgaging of land in response to large health and funeral expenses has been noted as has the possible neglect of health infrastructure for the poor. As time becomes an ever-scarcer commodity in HIV/AIDS areas, access to water and energy sources must be improved, particularly given the fact that these activities are socially determined to be the responsibility of women who most often care for their family members, irrespective of their HIV/AIDS status. Clear and equitable delineation of property and land rights become more important as individuals leave their dwellings to search for alternative livelihoods, or to help out friends and families outside of their community. If dwelling or land rights are linked to physical presence, property rights might be impaired, especially if widows and orphans are the primary claimants.

Natural Capital

We suggested that HIV/AIDS might undermine the ability of communities and user groups to pool risk and act collectively to sustainably manage common property including rangeland, cropland, and river basins. Land use is particularly vulnerable to the loss of prime-age labor. The maintenance of pre-HIV/AIDS cropping patterns becomes

more difficult for infected and affected families alike. “Replacement” labor can be found either via social networks or via the labor market. Otherwise less labor-intensive, livelihood-sustaining ways of farming land have to be developed. Both types of labor replacement strategy run the risk of new HIV infection. Labor market help might not be affordable for families affected by HIV. Moreover, the low labor intensity strategy is by no means guaranteed to be more livelihood sustaining than the system it replaces. Other impacts on land and land use include the cultivation of crops that are less labor-intensive, but less nutritious (e.g., some tubers), and the fallowing of land. If the family can afford to not use the land, this will improve the quality of the land for future cultivation. On the other hand, non-use of land may make the family vulnerable to loss of land rights. As highlighted by those with traditionally weaker land rights (e.g., some women and orphans), getting greater clarity and equity with respect to local property rights is particularly important.

IMPACTS ON THE RULES GOVERNING ACCESS TO ASSETS AND THEIR VALUE TO LIVELIHOOD GENERATION

Assets are only important to livelihoods if they can be accessed and they have an ability to support livelihoods when accessed. The rules governing access and value can be broadly labeled as “institutions.” Access to assets and the value of the assets tend to be

determined by cultural norms and values and by formal laws, policies, and organizations. These rules are influenced by HIV/AIDS in a number of ways.[5]

Cultural Norms and Values

We have already discussed the potential impact of HIV/AIDS on cultural norms relating to reciprocity, collective action, and exclusion. Obviously, HIV/AIDS also has the potential to affect a host of norms and values relating to more private behavior, such as sexual practices. Fundamental to these practices are power relations between men and women (Gupta 2000). There are many ways in which HIV/AIDS can deepen existing power asymmetries between men and women. Most directly, the inability of women to exert control over their choice of sexual partners and their inability to enforce HIV prevention measures contributes to the spread of HIV, particularly where HIV rates are higher for adult women than for adult men. Beliefs related to the healing powers of sexual intercourse with uninfected women provides a misguided rationale for a further degradation of women and their power over their sexual choices, and quite literally gives men enhanced control over a woman's very survival.

Other important changes in gender asymmetries relate to less personal but nonetheless crucial, assets. Prematurity of adult male death may deprive the female of the necessary time to build up a set of extrafamily levers—such as access to community land, to community groups, and to microfinance groups—that can be used to exert power

[5] The impact of HIV/AIDS on laws and policies will be discussed in Section 3.

within the family. If property and user rights for a whole range of assets are not clearly and equitably defined or are not enforced, women are likely to become less able to shape their own destiny. This lessening of women's relative power will tend to be reinforced via the subsequent diminished ability to control decisions relating to their own needs and those of their children in terms of health care, food intake, and work time.[6]

More generally, the spread of HIV/AIDS is thought to be associated with greater inequality, worsening inequality in turn (Collins and Rau 2000). For example, better-off regions and countries tend to attract migrants from less well-off areas. If infected, migrants are thought to have less access to services for prevention and mitigation than citizens do. In this manner, inter- and intra-country inequalities can drive the spread of the infection.[7]

Organizations

Some of the impacts of HIV/AIDS on organizations, both formal and informal, have already been noted. Organizations that are located in areas that are experiencing a high HIV/AIDS prevalence are characterized by high absenteeism, high turnover, and a loss of institutional memory. The organizations with the most resources may be most prone to capacity loss from HIV/AIDS. Those most able to finance fieldwork, to have the

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[6] However, it should be noted that the greater economic independence of women under conditions of weak control of choice over sexual partners may actually place the former at a greater risk of HIV infection if such independence is associated with greater livelihood mobility.

[7] Communication from Geeta Rao Gupta, President of the International Center for Research on Women, Washington, D.C.

ability to travel to share information, and to forge new alliances can inadvertently contribute to the spread of HIV/AIDS. Too few organizations in HIV-affected areas adhere to the adage “if you are not part of the solution, you are part of the problem.”

But the capacity of an organization is not only dependent on the knowledge embedded within it, but also on the ability of its members to innovate as a means of solving problems. Crucially, the innovation process that is so vital to the generation of context-specific solutions to development problems is undermined by the stigma, silence, denial, and discrimination that is part and parcel of HIV/AIDS. For example, undertaking community-based poverty alleviation or nutrition improvement in an area of high HIV/AIDS prevalence is much different from doing it in a low prevalence area.

One vital organization that serves as an important building block of the community is the household. Households look different in high HIV/AIDS areas. There are fewer working-age adults, more single-parent households, some youth-headed households, more three-generation households, more households with a missing middle generation, and more fostering in of other people’s children, whether or not they are family members. The demographic fallout and the demographic response to HIV/AIDS increase the need to distinguish between family and household for program and research purposes. It also highlights the need to begin exploring beyond households and families to other types of networks that exist between individuals within the same community and those that exist across different communities.

IMPACTS ON AGRICULTURE

This section discusses the reported impacts of HIV/AIDS with a particular reference to agriculture. We discuss impacts at the farm level for subsistence and commercial farms and at the farming systems level more generally. Many of the themes highlighted earlier in the discussion of assets resonate strongly in the following discussion of agriculture. This should not be surprising, given agriculture's important role in various types of livelihood.

The problems facing agriculture can be broadly characterized as (1) labor shortages, (2) knowledge loss, and (3) a loss of formal and informal institutional support or capacity (such as a weakening of property rights and a diminished ability and incentive for collective action). Compounding these problems is the type of asset depletion discussed above. Obviously farming systems that are less dependent on labor and on formal institutional support will be better able to respond to these losses. In general, however, high-input high-output agriculture characterized by farming in more favored lands will be particularly vulnerable, especially if the farming system is characterized by chronic poverty.

Several authors have attempted to highlight the dimensions of vulnerability of farming systems to HIV/AIDS. For Central Africa, Gillespie (1989) suggests that farming systems that exhibit high seasonality of labor demand, a high degree of specialization by age and sex, a high degree of interdependence of labor inputs, increasing returns to scale of labor, and a low substitutability of labor for capital are particularly vulnerable to HIV/AIDS. Barnett and Blaikie (1992) suggest that farming systems that have fertile

soils, abundant and well-distributed rainfall, and crop diversity are more resilient to labor loss. They also cite the importance of the food security of the households that comprise the system, the existence of excess labor supply, and the ability to switch to less labor-intensive crops within existing constraints as crucial to vulnerability assessment. One could add to these general dimensions of vulnerability the dependence on property rights and collective action.

Others have suggested that this type of approach is too narrow in that it does not take into account the current diversity of livelihoods that farmers exhibit and the potential they have to diversify further into nonfarm activities that are less labor-dependent (Rugalema 1999b; Topouzis 2000).

At the farm level, the impacts on farming practices have been summarized in a number of reviews (White and Robinson 2000; Topouzis 2000; FAO/UNAIDS 1999; Barnett and Halswimmer 1995; Barnett and Blaikie 1992). The broad ways in which HIV/AIDS changes the context within which agricultural growth is expected to take place are summarized in Table 2.

We can speculate as to the phasing of such responses in a stylized manner, but context is, of course, crucial. Many of the initial responses of farmers are to look for ways of "importing" labor to replace labor lost to mortality, morbidity, or to caring for the infirm. Tibaijuka (1997), for example, reports that within case study households in Kagera, Tanzania, containing a person living with HIV/AIDS, between 18 and 57 percent of the nurse's time was diverted towards caring for him or her. We can hypothesize that

this is an initial response to the crisis. More children are pulled into farming and both adults and children work longer hours.

Table 2—Summary of the ways in which HIV/AIDS may affect agricultural growth

How does HIV/AIDS change the context of agricultural growth?	Leads to . . .
<u>Labor changes</u>	
Shortage of household labor due to . . . • mortality • surviving adults take care of infirm Shortage of hired labor due to . . . • mortality • migration to cities • lack of cash to pay for it	• less land being farmed • underfarming of land in absence of labor sharing and well-defined property rights • more child labor • less labor-intensive crops grown • emphasis on meeting food needs first and cash crops later • greater emphasis on small livestock cultivation • decline in marketed output for crop processors • natural resource mining (the future is heavily discounted)
<u>Loss of farm-specific knowledge</u>	
• premature mortality curtails period for intergenerational role modeling and knowledge transfer	• less appropriate farming practices within a more hostile farming environment • more farmers who are inexperienced and need training, role models (e.g., youth)
<u>Income changes</u>	
• fewer earners, increase in dependency ratio • greater expenditure on medical, transport, special needs of ill	• more off-farm income sources • migration
<u>Institutional and organizational changes</u>	
• loss of institutional knowledge, high turnover, low investment in staff development	• weaker rural institutions (e.g., extension services, microfinance institutions, NGOs) • weaker social capital • weakening of property rights for some • weakening of asset base of women (especially land)

The next phase may be characterized by a search for crops and cultivation techniques that depend less on labor. So there may be a switch into the cultivation of

roots and tubers, the raising of small livestock, and a renewed emphasis on food crops as opposed to cash crops. The underfarming of land may occur due to labor shortages that may be exacerbated by a reluctance to engage in labor sharing arrangements where user and ownership rights are not clearly defined. There is a reduced ability to rely on formal and informal institutions to help newly minted farmers, whether youth or widows, to understand the opportunities and constraints that exist in a rapidly changing agricultural landscape. Any losses in marketed output will also cut into the livelihoods of local food processors. Losses in agricultural productivity will result in lower demand for nonfarm rural products and subsequent lower demand for farm inputs from the rural nonfarm sector. Growth linkages between the farm and nonfarm sectors will be weakened just as more farmers are seeking to diversify livelihoods into nonfarm activities. Inappropriate crop and livestock management may have significant negative externalities in terms of the spread of plant and animal diseases to non-HIV areas.

When these trends become intensified, there may be nothing to be done with land other than sell it or leave it fallow. Both of these options are likely to exacerbate existing asymmetries in property rights, including those that exist between men and women. The incentives to manage communal resources so that they support livelihoods over the long term are diminished as more and more people do not envisage a long term for themselves. Natural resource mining becomes the norm. Households—particularly those with multiple adult deaths—may break down as adults die or migrate in search of work. Social networks fragment and cannot bridge the divides caused by premature adult death on a pandemic scale.

As White and Robinson (2000) note, the impacts of HIV/AIDS on the commercial agricultural sector are even less well understood than the impacts on the semi-subsistence sector. If the commercial sector is dependent on migrant labor, it is susceptible to HIV/AIDS, more so if the laborer is resident without his or her family. Social networks will tend to be weaker for laborers in the commercial sector. However, the commercial sector can be a force for good in the sense that it can provide information and training for prevention, and it might provide opportunities for AIDS orphans to learn some essential agricultural skills.

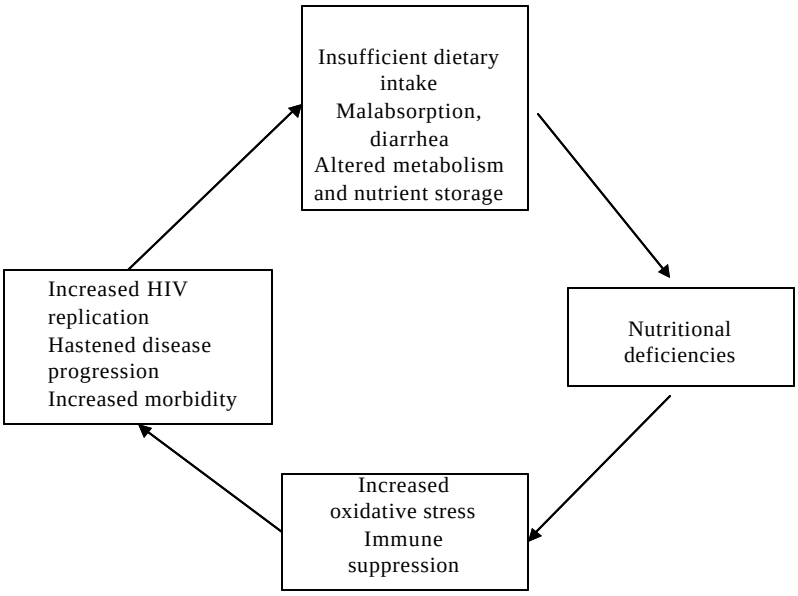
IMPACTS ON NUTRITION

HIV/AIDS has significant impacts on nutrition at the level of the individual, household, and community. Malnutrition, in turn, increases both the susceptibility to HIV infection and the vulnerability to its various impacts.

At an individual level, HIV infection 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 (Piwoz and Preble 2000) (see Figure 6).

Nutritional deficiencies may lead to oxidative stress and immune suppression, which, in turn, lead to increased HIV replication and hastened disease progression. Increased morbidity brings with it heightened nutrient requirements and reductions in the efficacy of absorption and utilization of nutrients (Semba and Tang 1999). HIV-infected

Figure 6—The vicious cycle of malnutrition and HIV



Source: Semba and Tang (1999).

individuals have higher nutritional requirements than normal, particularly with regard to protein (up to 50 percent increased), and energy (up to 15 percent). They are also more likely to suffer a loss of appetite, even anorexia, thus reducing dietary intake at the very time when requirements are higher. Moreover, such interactions are thrown into starker contrast for the poor who are more likely to be malnourished prior to becoming infected.

Research shows that the chance of infection with the HIV virus might be reduced in individuals who have good nutritional status, with micronutrients and, especially, vitamin A playing significant roles; the onset of the disease and even death might be delayed in well-nourished HIV-positive individuals; and diets rich in protein, energy, and

micronutrients help in contributing resistance to opportunistic infections in AIDS patients (ACC/SCN 1998).

Mother-to-child transmission (MTCT, or vertical transmission) of HIV is a major nutritional issue. MTCT may occur during pregnancy (5–10 percent chance), at birth (10–20 percent), or via breastfeeding (10–20 percent to 24 months). In a recent study, exclusive breastfeeding appeared to protect against the transmission of HIV, with a higher risk in partial breastfeeding. Observational data have shown that three-month-old infants of HIV-positive women who were exclusively breastfed have the same risk of contracting HIV as infants who were never breastfed (Coutsoudis et al. 1999). In contrast, infants who were partially breastfed had a significantly higher risk. A follow-up prospective study of 551 HIV-infected pregnant women in South Africa has shown that infants exclusively breastfed for 3 months or more had no excess risk of HIV infection over 6 months than those never breastfed (Coutsoudis et al. 2001).

Several biological mechanisms could explain why exclusive breastfeeding might be protective compared to partial breastfeeding. These include reduced exposure of the infant to bacterial contaminants and food antigens, thus reducing immune activation (Cebra 1999), increased integrity of the intestinal wall (Goto et al. 1999), development of microflora, which limit adhesion and growth of pathogenic organisms (Mackie, Sghir, and Gaskins 1999), and reduced risk of subclinical mastitis, which occurs during breast engorgement (Willumsen et al. 2000). Research is under way to confirm if these important observational findings are, in fact, causal. Infants of mothers who have an

adequate vitamin A status might have a reduced risk of vertical transmission (Friis 1998). The policy and program implications of MTCT are discussed in Section 3.

These are the predominant direct impacts on infected individuals. But there are other important *indirect* impacts at household and community levels. These may be brought about by, for example, a diminished capacity of caregivers to care for themselves, their young children, or AIDS-infected household members. In many poor households, even those unaffected by the pandemic, childcare may be compromised in the short term to ensure food security in the long term. Any adverse impacts on the quality or quantity of childcare of such decisions are likely to be exacerbated by shocks, such as HIV/AIDS, that may drastically reduce household caring capacity.

3. POLICY AND PROGRAM RESPONSES TO MITIGATE THE IMPACTS OF HIV/AIDS

This section discusses some of the potential policy and program responses for the mitigation of AIDS impacts. We focus on the specific areas of agriculture and nutrition, bringing in, whenever helpful, more general discussions of the livelihood responses that underpin actions in both sectors. There are, however, a number of general issues related to public response that need to be discussed before sector-specific responses to HIV/AIDS are considered.

GENERAL ISSUES OF PUBLIC RESPONSE

Do No Harm

Any public-sector attempts to respond to HIV/AIDS in terms of mitigation need to "first do no harm." A number of private-sector responses have deliberately reduced the abilities of households with infected members to mitigate the effects of HIV/AIDS. Examples include the capping of medical benefits for HIV-infected employees, reductions in funeral leave, and reductions in company contributions to funeral expenses—all examples from South Africa (White and Robinson 2000). More difficult to detect, but perhaps less difficult to amend, are the interventions or policies that inadvertently increase the risk of HIV infection or impair the ability of households and communities to mitigate the effects of AIDS. Actions that reinforce gender imbalances in power or those that displace individuals without adequate HIV monitoring and prevention efforts would fall into this category (Topouzis 2000).

What's Different?

What is the extent of "HIV/AIDS-specificity" required for an intervention to be effective in mitigating the impacts of HIV/AIDS? Specifically, when do governments, NGOs, communities, and development agencies need to (1) improve the performance of existing efforts; (2) view HIV-prevention and mitigation interventions through a poverty lens and modify appropriately; (3) view agriculture, anti-poverty, and nutrition interventions through an HIV lens and modify appropriately; or (4) design completely new interventions to address HIV/AIDS? Development agents obviously need to be open

to all possibilities, but a hard look should be taken at the role existing interventions and policies play, or could play, in HIV/AIDS mitigation before completely new and capacity-straining interventions are developed. Development practitioners should not be blind to the threat of HIV/AIDS, but neither should they be blinded by it.

Long-Term Impacts

Interventions need to be designed and assessed not only in terms of their ability to mitigate the current impacts of HIV/AIDS, but also in terms of their ability to reduce susceptibility to future infection and vulnerability to various types of impact. Effective mitigation can be one of the best methods of effective prevention (Topouzis 2000). Interventions that support the development of sustainable livelihoods can reduce future exposure to infection, although this is not a given. The existence of livelihood options that are sustainable can help reduce the incentive to undertake livelihoods that are built either on risky behavior (e.g., commercial sex workers) or on long periods of nonresidence.

Sectoral Limits

There is a need to recognize the limits of influence of sectoral policies and interventions in terms of their ability to mitigate the impacts of HIV/AIDS. Take the development of labor saving technologies and the development of social capital in affected communities. Both are crucial for mitigating the impacts of HIV/AIDS, but

agricultural policy is much more likely to be able to deliver the former as opposed to the latter.

Monitoring

It is difficult for policy and programs to respond to HIV/AIDS if the epidemic cannot be monitored effectively. A monitoring system that is relatively simple but able to track the changing HIV/AIDS situation with the required accuracy and reliability to guide timely action remains elusive. This is likely to be due both to a weak demand for such information and a weak ability to supply it. How to generate such a demand is a difficult question to answer. The stigma, denial, and silence attached to HIV/AIDS makes the task more difficult than, for example, developing early warning drought indicators. Moreover, the capacity to generate such information is undermined by HIV/AIDS. A number of such generic indicators have been suggested in the literature, but how many are likely to be cross-culturally robust is an open question (see Topouzis 2000). A balance has to be found between indicators that can be compared across communities and administrative units, and a process that can generate more context-specific indicators. Such a process must involve the community. Their knowledge will be invaluable not only in identifying indicators, but in clarifying their use and delineating what is feasible in terms of who will collect relevant data.

Targeting

If working monitoring systems can be designed, a question is raised as to whether or not non-HIV interventions should be targeted using indicators such as the prevalence of adult deaths? The World Bank's Confronting AIDS document (1997) and Ainsworth and Teokul (2000) discuss the advantages and disadvantages of using adult death rates (from all causes) in conjunction with other indicators to target poverty interventions at the household or community level. Others have suggested that the best way to use HIV/AIDS data is to modify the nature of existing interventions so that they better meet the needs of HIV/AIDS survivors (Parker, Singh, and Hattel 2000).

Scale

Most HIV/AIDS programs are very small-scale in nature, and have been referred to as "expensive boutiques," available only to a small percentage of the affected population (Binswanger 2000). For example, in Kagera, Tanzania, a highly studied region, only two of five districts are covered by HIV/AIDS services (in this case, preventive), and within these districts, a mere 5 percent population have access to services. Multisectoral top-down coordination of integrated rural development programs failed in the 1970s and 1980s (World Bank 1988), and such mistakes should not be repeated. There does nonetheless remain a need for some top-down support of bottom-up processes in the areas of setting of policies and program parameters, cofinancing programs, facilitation and training, monitoring, and evaluation (Binswanger 2000). The challenge is to find ways of scaling up locally-relevant, community-driven approaches.

Research

Finally, the research base upon which HIV/AIDS impacts are assessed and upon which interventions for mitigation are evaluated is very narrow. A small number of good studies do exist in refereed journals. More exist in the unpublished literature. But given the scale of the problem, the research base is remarkably small. We will return to this subject in Section 4.

AGRICULTURAL POLICIES AND PROGRAMS

The options for policy and program response in agriculture can be grouped around the three clusters of impacts noted in Section 2: labor losses, knowledge losses, and weaknesses in institutions. These tend to be most noticeable beyond the initial phases of the epidemic. All are compounded in a downward spiral whenever asset depletion is a short-term response.

Discussion of HIV/AIDS issues can be included in agricultural services provision. Examples include Integrated Pest Management (IPM) programs in Southern Africa that have incorporated information on HIV prevention, care, and mitigation into IPM training. Also, in Southeast Asia, farmer field schools and IPM student field schools have addressed HIV prevention issues (White and Robinson 2000). There may be a benefit to targeting scarce extension resources to higher risk groups such as seasonal agriculture workers, estate workers, and fishermen. As with any sector, monitoring systems need to be established to assess the adequacy of responses and the progression of the epidemic.

Research at national agricultural systems should be encouraged into the substitutability of labor and capital in local farming systems in anticipation of severe labor shortages.

But perhaps the most profound challenge to the agriculture sector in countries threatened by HIV/AIDS is the need to develop agricultural and natural resource management systems that are more labor-extensive and use less purchased inputs but support sustainable livelihoods. In the absence of new technology and techniques, farmers are thought to be switching to feasible low input extensive farming that is preferable to infeasible labor-intensive, higher input farming (Page 1999).

Yet, in switching to low input, low output agriculture, farmers run the risk of adopting an ultimately destructive "coping strategy." If the loss in agricultural productivity from pre-epidemic levels is sufficiently large, farm and nonfarm incomes will slowly cycle downwards. The move to low input, low output farming buys some time but is unlikely to be a sustainable solution. The challenge for the agricultural community and specifically for the agricultural research community is to develop farming practices that adapt to the reality of middle and late-stage HIV/AIDS affected environments and yet maintain productivity levels. For this to happen, it is likely that the surviving farmers should be ever more closely involved in planning and implementation of supporting research (Topouzis and de Guerny 1999). One simple example of a technological adaptation to an HIV/AIDS environment is the development of lighter ploughs for use by women and youth (White and Robinson 2000).

Proposed methods for combating information and knowledge losses include farmer field schools where experienced farmers share their knowledge with less

experienced farmers (youth and widows). For example, an initiative in Zimbabwe involves participatory training for AIDS widows in the production of cotton, a crop normally grown by men (White and Robinson 2000). Extension services—themselves severely depleted by the epidemic—must focus more on youth to "fill the void." Information losses are also crucial in terms of the role traders play in bridging the gap between farm and market. Recent research has emphasized the important role played by trader-farmer networks of information and social relations that embody reciprocity based on trust (Fafchamps and Minten 1999). This is one of the forms of social capital that HIV/AIDS is thought to undermine. Mobile traders are thought likely to be relatively susceptible to HIV/AIDS and, given the already thin nature of agricultural markets in many parts of Sub-Saharan Africa, the consequences are likely to be serious. Efforts to support these networks need to be developed.

Agriculture does not take place in a vacuum. Successful efforts to strengthen the institutions that support farming in the face of the HIV/AIDS onslaught are difficult to find. An important first step is to improve the access to HIV prevention information and technology for members of that institution. Second, what is the ability of the institution to strengthen itself? We do not know enough about which types of capacity constraints are most binding and which have been most damaged by HIV/AIDS. This is another important step to take before increasing resources for staff development and recruitment. Recent experiences from some of the most badly affected countries have demonstrated the ability of an important rural institution, microfinance, to innovate and develop

products that better meet the needs of the emerging clientele—especially as in Uganda, where national leadership has openly confronted HIV/AIDS (see Box 2).

Box 2—Examples of innovation in microfinance as a response to HIV/AIDS

- Pilot health insurance. Covers AIDS treatment, not medication. Covers limited time period. Confinancing of visits required. Certain percent of village bank members must sign up (FINCA/Uganda).
- Mandatory loan insurance. One-time fee is paid, which covers outstanding loans in the case of client death. Also, mandatory death benefit insurance covering burial and related cost for client and up to five dependents (Opportunity International, NGO).
- Education trust fund for minors (Opportunity International).
- Younger people recruited as clients (White and Robinson 2000).
- Clients encouraged to hand over businesses/farms to relatives as soon as health starts to fail (White and Robinson 2000).

Source: Parker, Singh, and Hattel 2000.

The roles of microfinance institutions and the NGO community that helps animate them will be crucial in the prevention and mitigation of HIV/AIDS in the new HIV/AIDS battlegrounds of South and Southeast Asia, where so much microfinance innovation has taken place in general. If such types of innovation are to occur at the intersection between community and institutions that are accountable to them, donors will need to be more flexible in the programming of resources (see Kraak et al. 2000 for a discussion of this in relation to food aid).

Table 3 summarizes the agriculture responses discussed in this section by the potential impacts on current mitigation efforts and on future vulnerability. The latter breakdown highlights the need for the agricultural population to look outside agriculture

Table 3—Agricultural policies and programs to reduce the current and future impact of HIV/AIDS

Agricultural	Intervention to mitigate current impact (on infected and affected)	Intervention that does not (perhaps inadvertently) mitigate current impact
Intervention that may reduce susceptibility to future infection and vulnerability to its impacts	• More high yielding, drought resistant crops that are less labor-intensive • More agriculture tools that are less labor-intensive • National Resource Management (NRM) practices and arrangements that are less labor-intensive • Diversification of livelihoods to reduce the dependence on a given type of labor • Dispersal of farming knowledge to nontraditional surviving farmers (e.g., field schools) • Clarify property rights in an HIV/AIDS context and modify if necessary to protect women • Strengthen insurance mechanisms that allow farmers to better handle risk • Stronger and more client responsive rural institutions (e.g., microfinance institutions) • Living arrangements in commercial farming that can accommodate family members of migrant workers	• Let land go fallow if it is the only way to retain control over it
Intervention that may inadvertently increase susceptibility to future infection and vulnerability to its impacts	• Low-output farming that leads to more migration of rural male labor • Import of hired labor from infected areas	• Large rural construction projects that do not take into account temporary worker conditions and HIV monitoring

as well as within it to successfully diversify labor needs—both in terms of quantity and in terms of skills.

NUTRITION POLICIES AND PROGRAMS

There are several different approaches to designing and implementing appropriate nutrition-relevant actions aimed at preventing and/or mitigating HIV/AIDS impacts. A first distinction needs to be made with regard to the intended beneficiary or beneficiaries. Interventions may be targeted to individual persons living with HIV/AIDS (PLWHA) with the aim to prevent nutritional depletion (among people who are HIV-positive), or to provide palliative nutrition care and support for people with AIDS and for the families who care for them. Relevant specific objectives of such programs might include action

- to improve quantity and quality of diet among people with HIV/AIDS;
- to build or replenish body stores of micronutrients;
- to prevent or stabilize weight loss;
- to preserve (and gain) muscle mass;
- to prevent diarrhea and other digestive discomforts associated with fat mal-absorption;
- to speed recuperation from HIV-related infections;
- to prepare for and manage AIDS-related symptoms that affect food consumption and dietary intake.

Nutritional support has the potential of significantly prolonging the life of individuals for their own benefit and those who are dependent on them for care (e.g.,

young children), thus, in a sense, postponing mitigation and reducing vulnerability to impacts.

Nutritional support for people with HIV and with AIDS should be provided in a holistic manner that strengthens all three of the main preconditions of good nutrition (food security, health and environment services, and care). Appropriate treatment of opportunistic infections, stress management, physical exercise, and emotional, psychological, and spiritual counseling and support, for example, are all potentially relevant here (Abdale and Kraak 1995).

Outside of a clinical setting, there is a major issue as to how to do this in a way that does not stigmatize the beneficiary. Community-level targeting to communities that are found to be significantly affected by HIV/AIDS (using whatever proxy indicators are relevant) is likely to be far more feasible and effective than targeting to individuals or households. A second-stage targeting might be employed with regard to stages in the life cycle that are particularly susceptible and vulnerable (e.g., adolescent girls, pregnant women, and young children).

Nutrition (and related, hygiene) interventions are likely to have the greatest overall impact early in the course of disease by prolonging the period of relative health with asymptomatic infection (this is the period before metabolic abnormalities are driving the nutritional course of infection, before AIDS) (Piwoz and Preble 2000). Unfortunately, relatively few people know they are infected at this time.

Various conventional nutrition interventions will be affected differently when an HIV lens is applied (Piwoz, personal communication). For example, within breastfeeding

and complementary feeding programs the need to provide clear information to policymakers, health providers, and communities about MTCT facts, including risks and benefits of breastfeeding and alternatives, needs prioritizing. There is a need to anticipate the increased challenges to complementary feeding programs as more women may choose to stop breastfeeding earlier. Households affected by HIV/AIDS will have even greater time and economic constraints to the provision, preparation, and feeding of appropriate complementary foods.

Programs to address women's nutrition may not require substantial content changes, but need much greater support all around, especially for breastfeeding women. Again, these challenges will be further accentuated by the progressive weakening of health care and other delivery systems.

Affected communities may be targeted for the following types of interventions:

- nutrition education and counseling in health facilities, in community settings, or at home to change dietary habits, to increase consumption of key foods and nutrients, or to manage anorexia and other conditions that affect eating patterns;
- water, hygiene, and food safety interventions to prevent diarrhea;
- food baskets for home preparation; and
- home-delivered, ready-to-eat foods for homebound AIDS patients who are unable to prepare their own meals.

HIV/AIDS is also affecting populations that are not traditionally reached by nutrition programs (e.g., young adults and men), which adds importance to interventions that reach broader segments of the population. One question here, for example, concerns the feasibility of small-scale fortification. Finally, given the effects of HIV/AIDS on agriculture and household livelihoods, the nutritional implications of agricultural policies and programs will assume even greater importance.

How Does Mother-to-Child-Transmission Change Policy?

The finding that HIV is transmitted through breastmilk has complicated infant feeding recommendations (Nicoll et al. 1995). Recognizing breastfeeding as a significant and preventable mode of HIV transmission, the Joint United Nations Programme on HIV/AIDS (UNAIDS), the World Health Organization (WHO), and the United Nations Children's Fund (UNICEF) issued new guidelines on HIV and infant feeding (WHO 1998). These guidelines call for urgent action to educate, counsel, and support HIV-positive women in making decisions about how to feed their infants safely.

Evidence of the protective effect of exclusive breastfeeding (Coutsoudis et al. 1999, 2001) only emerged after these guidelines were published. Further confirmation of this finding and the benefits of "safer" breastfeeding practices (see Table 4), on the risk of mother-to-child transmission of HIV, is a necessary first step in the development of a policy recommendation that would permit infants to benefit from the myriad benefits of exclusive breastfeeding while avoiding the risk of HIV transmission through partial breastfeeding. Much of the debate and controversy in this area has revealed a limited

understanding of the multiple extra benefits of exclusive breastfeeding and the serious trade-offs and dangers of moving away from such a policy recommendation.

Table 4—"Safer breastfeeding" practices for women infected or at risk of HIV

All women who choose to breastfeed should…	HIV+ women who choose to breastfeed should also…
• Initiate breastfeeding immediately after birth. • Receive counseling and support to demonstrate appropriate infant positioning and breast attachment. • Receive counseling and support to encourage, understand, and implement the practice of exclusive breastfeeding. • Become familiar with the process of lactation in order to be able to identify potential problems associated with breastfeeding and how to overcome these while continuing to breastfeeding (e.g., breast engorgement, inflammation, sore nipples, etc.). They should know how to relieve engorgement with frequent emptying of the breast and hot compresses. • Receive counseling and support to encourage safe sexual activity and to understand the risk of HIV transmission through breastfeeding (and alternatives). • Receive counseling and support to continue breastfeeding and to introduce safe and appropriate complementary foods after 6 months.	• Be advised to express and discard breastmilk if there are signs of engorgement, blocked ducts, or inflammation. They should continue to feed from the unaffected breast. Medical attention should be sought if the engorgement or blocked ducts do not resolve within 1-2 days or if breast pain, fever, or other indication of mastitis or HIV disease progression is experienced. • Receive counseling and support describing the risks and benefits of early cessation of breastfeeding. On an individual basis, their ability to secure safe and appropriate replacement feeding should be assessed. They should be advised that continuing to breastfeed may still expose their baby to HIV but that early cessation of breastfeeding may increase the risk of poor growth and non-HIV diseases such as diarrhea. • Women who choose to discontinue breastfeeding should receive counseling and support to facilitate a rapid transition to replacement feeding.

Source: Piwoz and Preble (2000).

Yet despite these findings slowly gaining acceptance, there remains a strong resistance on the grounds that exclusive breastfeeding is both rare (Haggerty and Rutstein 1999) and difficult to promote. Much clearly remains to be done. Breastfeeding

promotional efforts need to be rapidly improved, including expanding the Baby Friendly Hospital Initiative (BFHI) to rural hospitals, and strengthening its links with communities (the tenth step in the Innocenti Declaration), as well as advocating for the breastfeeding rights of working women (using, for example, the new ILO Maternity Protection Convention 183 and Recommendation 19, which advocates longer paid maternity leaves and other needed workplace support).

The Importance of Process

As a multifaceted subject requiring action from several sectors, nutrition is, and always has been, vulnerable to bureaucratic inertia deriving from compartmentalized organizational structures that offer few incentives for integration or convergence. Magic bullets are generally the preferred way to go—witness the prominence attached to vitamin A capsule distribution and salt iodization during the 1990s. There is nothing intrinsically wrong with magic bullets unless they end up crowding out other important and necessary longer-term holistic approaches to nutrition. This has certainly happened, and the UN Sub-Committee on Nutrition's *Fourth Report* (ACC/SCN 2000) shows the relative stagnation of child anthropometric outcomes when compared to micronutrient indicators. While micronutrient supplementation (particularly vitamin A) will have a role in nutritional support to AIDS-affected communities, this mistake should especially not be repeated in the case of HIV/AIDS communities—not least given the significantly raised energy and protein requirements of PLWHA that cannot be met by pills.

Better advocacy strategies—that consider the role of values, attitudes, and interests as well as information—undertaken by skilled policy entrepreneurs, ideally backed up by prominent champions in the countries concerned, need to be developed.

At the community level the key is to create space for this iterative process of assessment, analysis and action. In a malnutrition context, the incentive to implement such a time-intensive process is that the nutrition of pregnant women, children, and babies can get better, to some extent, as a result of interventions. HIV interventions can only offer avoidance of the (devastating) negative, at least at the individual level. At the community level, the promise of declines in the incidence of HIV can be proffered.

The urgency of the situation requires that external facilitators of such local decision-making processes anticipate the ways in which external support can be channeled before an assessment. This does not pre-suppose the findings of the assessment, which usually result in identification of certain bottom-up action priorities and areas for external (top-down) support. But it does avoid raised expectations being dashed.

Finally, there appears to be a need for the international nutrition community to come to a consensus on how to approach HIV/AIDS mitigation. The debate about MTCT has overshadowed the potential contributions of nutrition. The United Nations Sub-Committee on Nutrition (ACC/SCN) is an ideal forum to seek such a consensus.

4. RESEARCH IMPLICATIONS AND PRIORITIES

What is the role of the research community in improving the effectiveness of agriculture and nutrition policy and program response in areas affected by HIV/AIDS? What is the main constraint to more effective mitigation? Information? Money? This is an issue on which there is no consensus, but it is one that should be further investigated. The lack of hard evidence behind many of the points summarized in this paper, however, is a clear indication of an information deficit. The paper has suggested that more and better information and analysis is needed in order to make more effective use of existing resources. It may also lead to more resources being available to combat HIV/AIDS. In short, the resource and information constraints are connected.

Given that there is an information gap to be filled, the need to act quickly is fuelling some evident tensions in how best to proceed. Is the real bottleneck the absence of information or rather its inaccessibility? If indeed more information needs to be generated, does research focus more on the impact of HIV/AIDS or more on evaluating the policy and program responses to HIV/AIDS? In either case, where is the greater emphasis placed: on developing and funding new data collection efforts or on augmenting existing data collection efforts? Should research efforts be undertaken in the mostly Sub-Saharan countries in which HIV/AIDS prevalence rates are relatively high or mostly in the countries of Asia and Latin America, where they are relatively low? Should the research effort be focused more at the small-scale intervention level or more at the national policymaker level?

The answers to these questions will be context specific and the choices made will likely reflect degrees of emphasis rather than absolutes. In short, there is a need to act on different fronts, depending on the intended audience. This section suggests and describes action on five fronts, ranging from activities that will bear fruit in the short term (information sharing and capacity assessments) to those that will take a longer time to deliver (information generation activities).

INFORMATION-SHARING: CLEARINGHOUSE

It is clear that there is no real forum for information exchange from the field on mitigation experiences. Such a forum would permit an exchange of information on effective innovations in one region that might be successfully adapted for another region. Intervention attempts will be able to draw on the lessons learned from previous efforts. Advocacy efforts can be supported through giving a voice to development practitioners and researchers who are working to increase the overlaps between the agriculture, food, and nutrition communities and the HIV/AIDS community. Important short-term goals for such a clearinghouse could be to help to place HIV/AIDS on to the agenda for a number of upcoming international fora, such as the World Food Summit+5, as well as the 2002 Barcelona AIDS Conference (re: mitigation work).

CAPACITY ASSESSMENT: IMPACTS OF HIV/AIDS AND ABILITY TO RESPOND

Action research is needed to (1) develop methodologies and tools for assessing and analyzing community capacity to mitigate HIV/AIDS impacts, in order to improve

the congruence between external programmatic inputs and community needs; and (2) improve the content and process of direct approaches to building such capacity.

In numerous nutrition-related program evaluation reports, limited progress or failure is attributed at least in part to "inadequate capacity." Yet capacity is rarely pro-actively assessed up front as part of the problem definition and program design process. Existing capacity gaps and weaknesses thus persist as constraints to implementation and impact.

Capacity constraints at all levels from the household to national institutions will be even greater in the face of HIV/AIDS and as the epidemic progresses, such capacities will be further eroded. It is thus essential that existing capacities are assessed quickly but comprehensively as a part community-driven assessment-analysis-action (Triple-A) process, and that such assessments be repeated periodically. This is relevant to any mitigation activity, not just nutrition.

The human rights-based approach to nutrition programming now being advocated and articulated by many United Nations agencies demands a focus on capacity—simply because any duty-bearer (such as a child's primary caregiver or a government) cannot be held accountable unless the capacity exists for such duties or obligations to be carried out.

ACTION RESEARCH ON MITIGATION INTERVENTIONS RELATED TO AGRICULTURE, FOOD, AND NUTRITION

Not enough research is being undertaken that is intimately tied to mitigation interventions (e.g., community based HIV/AIDS monitoring, new microfinance services, new patterns of crop cultivation, and new cultivation technologies). This is particularly true of interventions in the areas of agriculture, food, and nutrition. This type of research is given high priority by many experts in this area. As Topouzis (1999) concluded in a recent review of food security impacts of HIV/AIDS, "research on the impact of HIV/AIDS on rural households should only be undertaken in the context of process-oriented action research that combines data collection with raising awareness of HIV/AIDS."

There are many challenges to this kind of research. For evaluation, the ability to randomize interventions at the community level is always desirable, for both quantitative and qualitative research methods. This minimizes the biases due to program placement and the self-selection of participants. However, even where intervention resources are insufficient to address the entire needs of the eligible population, such randomization is difficult both politically (the leaders of community's that are excluded in a random fashion understandably feel aggrieved) and ethically (if one has a good idea that a mitigation intervention will be effective, what are the grounds for denying the control group the intervention?).

The difficulties surrounding these issues are heightened in the context of HIV/AIDS due to the severity of the shock and the issues of stigma that surround

infection. At the very least the research team has to commit itself to working with the intervention team to provide advice and other supplementary health services to those affected and afflicted with HIV/AIDS. Although qualitative research might lessen the difficulty of some of these issues due to a less expansive research design, the more intensive nature of the research may result in additional problems (i.e., confidentiality). Nevertheless, these difficulties have been overcome in other fields, such as nutrition, fertility and STD infection. In areas where the evaluation of HIV/AIDS prevention interventions has taken place, the evaluation of mitigation efforts may pose less of a problem. Mitigation research will be more difficult in locations where there is no open discussion of the infection.

RESEARCH ON THE AGRICULTURE, FOOD, AND NUTRITION POLICY PROCESS AND INFLUENCE OF HIV/AIDS

When do policymakers in the agriculture, food, and nutrition area begin to realize that they can contribute to the mitigation (and prevention) of HIV/AIDS? What can we learn from the countries most heavily affected by HIV/AIDS about the policymaking process in agriculture, food, and nutrition in relation to HIV? How do policymakers learn? What are the relative roles of information, and the attitudes, values, and interests of decisionmakers? When are pressure/advocacy groups important? It would also be instructive to evaluate existing policies with regard to their effects on the distribution or severity of HIV/AIDS impacts. Which policies are HIV-averse, which are neutral, or

which are positive with regard to impacts? Which have potential for modification, and how might such changes be promoted?

These are some of the political science or political economy questions that can be unraveled via a set of policy case studies. The value of this work would be particularly high for the countries that have not yet felt the full force of HIV/AIDS if a way could be found to overcome sensitivities about one region learning from another.

DYNAMICS OF HIV/AIDS IMPACTS: FOCUS ON INTERGENERATION AND SPATIAL EFFECTS

The research on the impacts of HIV/AIDS as an aggregate shock has not been well served by those who have worked on other types of aggregate shock. Consequently, the lessons learned and the methodological tools used in investigating the impacts of and private and public responses to shocks have not been sufficiently well integrated into the HIV/AIDS impact and mitigation literatures. Similarly, the results of the few studies on HIV/AIDS impacts and shocks have not exerted much of an influence on the general shocks literature.

These two research communities need to come together. Pragmatism should be a guiding principle for the design of new research. Such an approach will help pull these two communities together and it will reduce the research costs and the time lag for the results to be of use.

For example, many household surveys exist from the early 1980s in areas that are now affected by HIV/AIDS. Resurveys of these areas will prove difficult in terms of

keeping attrition to acceptable levels, but survey protocols do exist to improve our ability follow households and individuals, and resources for this can be built in. What could such resurveys accomplish? They would examine how adult death affects the economic and social trajectory of different types of households. Why have some households been better able to withstand the adult death shock? Asset mix? Livelihood portfolio? The absence of other aggregate shocks? Better social networks? The resurveys would also allow us to test the validity of predictive models such as those put forward by Barnett and Blaikie (1992) on the vulnerability of certain types of agricultural systems. In order to maximize the value of such longitudinal survey data, it will be important to undertake connected qualitative studies of subsets of households and families to understand how assets, livelihoods, and other shocks interact and how households and families respond and how public policy helped or did not.

Where baseline surveys do not exist, HIV/AIDS modules (or shock modules more generally) could be added to ongoing or planned surveys. Cross-section analyses are not as rich as longitudinal analyses, but they have value in terms of estimating the impacts of shocks as evidenced in recent studies by Davis and Handa 2000 (the Peso crisis in Mexico); Datt and Hoogeveen 2000 (El Niño in the Philippines); and Dorosh, del Ninno, and Smith 2000 (the floods in Bangladesh).

Whether longitudinal or cross sectional surveys are used, the type of impact of HIV/AIDS on demographic structures and on private behavioral responses may render household and community units of analysis inappropriate for investigation of the impacts

of HIV/AIDS. For example, interhousehold links both within and across communities might be the key way of defining the investigation space.

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