

Vulnerability to HIV/AIDS in Sub-Saharan Africa

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Abstract: Labor is the vital component of agricultural production in Sub-Saharan Africa. If size and structure are changed productivity of the labor force will directly affect food production and consumption in the region. Sub-Saharan Africa, with 11 percent of global population, has an estimated 73 percent of global HIV/AIDS—related infections. Little is known about the net affect of HIV/AIDS on the agricultural economy, but vulnerability to food insecurity will certainly increase in the severely affected countries. The estimated health and productivity costs of the epidemic will have long-term implications on the economic growth of the countries.

Keywords: Sub-Saharan-Africa, AIDS, HIV, population growth, food production, food consumption, labor productivity.

Introduction

The projections of food gaps reveal the intensity of the current as well as the future food security problems in Sub-Saharan Africa. By 2010, this region is projected to account for 65 percent of the total (all 67 countries covered in this report) gap to maintain consumption and 75 percent of the gap to meet nutritional needs even though the region's population constitutes only 25 percent of the 67-country total. The region's nutrition gap, as a share of consumption (total available food supplies), is projected to exceed 10 percent by 2010. Added to the food problem is the prevalence of HIV/AIDS in the region. The future impact of the HIV/AIDS disease on food systems is of major concern because of the already low and declining per capita food consumption and the low level of agricultural productivity in the region. Also, coping with and combating the disease in rural areas where poverty is at its highest and education is at its lowest level is the biggest challenge facing both individual countries and the international community. This article reviews the historical role of population (and the labor force) in food markets in Sub-Saharan Africa and the expected impact of HIV/AIDS on the structure of the population. It also examines the likely implications of the disease on food security in highly infected countries. The final section reviews the coping mechanism and response capacity.

Background: Changes in Population Growth and Structure

Sub-Saharan Africa's population growth during the 1980s was the highest in the world—about 3 percent per year. Since

then, it has declined to 2.7 percent and is projected to decline further during this decade. The high population growth in Sub-Saharan Africa resulted from sharp mortality declines in the 1950s due to improved health services. Rapid population growth occurred in industrial countries between 1890 and 1920 and was supported by strong income growth and improvements in education and health. Their experience also shows that high population growth, when accompanied by appropriate and adequate investments in agricultural technology and supportive government policies, can have a positive impact on agricultural development. In Sub-Saharan Africa, however, fertility rates have remained high, incomes have stagnated, and low education levels have persisted. Although the high population growth put additional pressure on the demand side of the food market, it has remained the key source of productivity on the production side. In most Sub-Saharan countries, modernization of the agricultural sector has not yet occurred. Limited uses of new technology and poor market infrastructures are the two characteristics that have precluded an increase in agricultural productivity (see "Resource Quality, Agricultural Productivity, and Food Security in Developing Countries" p. 24.)

Now, after a long period of dealing with the burden of growing populations, the region is facing a sharp decline in population growth rates. The problem, however, is that the decline is not a natural progression of development, but a result of the rapid spread of HIV/AIDS. The disease has major implications for the economies and agricultural sectors of Africa.

The two severely affected regions are Southern and Eastern Africa. In Southern Africa, seven countries—Botswana, Lesotho, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe—are reported to have adult HIV prevalence of

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more than 20 percent. In most East African countries, HIV prevalence is more than 10 percent. In these countries, life expectancy is projected to decline to 30-40 years instead of 60-70 years (an estimate used prior to the spread of HIV/AIDS). According to a UN report, about 55 percent of all HIV infections in Sub-Saharan Africa are among women. Peak HIV prevalence among women is at age 25, that is 10 to 15 years earlier than for men, changing the structure of the population. Thus, the most productive age cohort, 15-45, is dying the fastest from HIV/AIDS. This age cohort is nearly 50 percent of the population in highly HIV/AIDS affected countries. HIV prevalence among the relatively educated as well as high-income urban population is as high or higher than among low-income and rural groups. In Rwanda, Congo, and Zambia, the level of HIV infection in the highest socioeconomic strata is two to four times higher than among those in the lowest category.

HIV/AIDS and Food Security

In the countries mostly affected by HIV/AIDS, slow growth in agricultural productivity and overall economic growth that limited purchasing power resulted in growing food insecurity over the last two decades. Even in countries such as Uganda where food supplies are projected to be nutritionally adequate, food insecurity remains a major concern because of the low and wide disparity in purchasing power. Table B-1 shows the projected nutritional vulnerability in selected countries that are highly affected by HIV/AIDS. These projections include the decline in population growth and productivity of labor, as well as can be estimated. Most of the available studies have focused on the medical costs, and there is limited information on long-term economic costs of HIV/AIDS and the variation of the effects on different groups within countries. By the same token, any quantification of the net effect of HIV/AIDS on the food system is preliminary. However, the food system will be certainly subjected to shocks that could amplify the food insecurity of many countries.

Shocks to Agricultural Productivity and Output from HIV/AIDS

The size of the supply shock depends on the extent to which HIV/AIDS reduces the productivity of the agricultural labor

in rural areas. The agricultural sector plays a crucial role in the economy of African countries in terms of both sources of food and exports to finance food imports. A review of the statistics of selected countries in table B-2 shows that with the exception of Kenya, the agricultural sector provides 80 percent of grain consumption in these countries. Grains contribute as much as 80 percent of per capita calorie consumption in these countries. The share of the agricultural sector in GDP for the same set of countries is in the range of 11 percent in Zambia to 47 percent in Tanzania.

With labor as the prime component of agricultural production, the implication of the HIV/AIDS epidemic on food security of the countries could be staggering. In projecting crop production for these countries, we use an elasticity of 0.3, meaning that with a 1-percent decline in labor availability, production will decline by 0.3 percent. However, we did not account for a change in the quality of labor. In the Food Security model, the marginal productivity of labor is assumed to remain constant over the projection period. For the Sub-Saharan countries, this may be an overestimation because the decline in population growth is in part due to the spread of HIV/AIDS, which affects the most productive segment of the population. A decline in healthiness of rural populations is expected to reduce labor productivity in rural areas. The World Health Organization estimates that local losses in agricultural productivity from HIV/AIDS at the household or village level range from 10 to 50 percent in about 10 Sub-Saharan African countries.

The high rate of infection among women will, in particular, have enormous implications on nutrition and poverty. Many farms are headed by women and on other farms women provide a large portion of total labor. For example, a study of two towns in Tanzania found that women provide 48 percent of agricultural labor including land preparation, planting, weeding, and harvesting while men did most of the marketing. Economic consequences will be compounded by the fact that women are barred from owning land in many countries. If a husband dies, the wife's lack of collateral limits her ability to obtain credit to keep the farm in operation or to purchase labor-saving technology. Also, an increase in the number of orphans places a burden on healthy women in the community

Table B-1--Grain market performance profile for selected countries

Region/ country	Annual production growth		Ratio of nutritional gap in grain equivalent in year 2010 to:	
	1980-99	1989-99	Production	Imports
	Percent			
East Africa:				
Kenya	0.44	-1.04	12.12	25.21
Tanzania	2.03	0.00	33.57	353.67
Uganda	2.18	1.29	.00	.00
Southern Africa:				
Malawi	1.83	4.14	18.11	213.54
Zambia	-1.22	-3.63	69.91	356.20
Zimbabwe	-1.06	-1.10	2.41	21.75

Source: Economic Research Service, USDA.

Table B-2--Agricultural indicators for selected countries

Region/ country	Grain import share in consumption 1997-99	Agricultural share in GDP 1997	Agricultural share in exports 1997
	Percent		
East Africa:			
Kenya	32.2	24.4	56.2
Tanzania	9.0	47.4	63.3
Uganda	5.2	41.4	76.0
Southern Africa:			
Malawi	12.9	44.6	76.8
Zambia	19.6	11.1	4.6
Zimbabwe	10.6	13.9	46.2

Sources: Economic Research Service, USDA and World Bank data.

who must care for the sick and dying, while simultaneously increasing their child care responsibilities. This dilemma compounds the effect of HIV/AIDS on agriculture because healthy women will have less time for farming activities.

Another factor that can worsen the situation is the likely change in cropping patterns. For example, farmers are expected to move away from labor-intensive export crops to more subsistence crops that use less labor. Among food crops, a switch from corn to cassava would conserve considerable labor. However, cassava is less nutritious than corn. Nutritional intake is already below minimum standards in several countries, including those highly affected by HIV/AIDS. In 14 of the 17 countries in East and Southern Africa, per capita daily caloric intake is below the level required to attain a minimum nutritional standard (the calories required to sustain life with minimum activity). The nutritional vulnerability of the countries is projected to grow by 30 percent in the next decade. A domino effect follows: food supply deficits and decreased healthiness impair agricultural productivity through reduced food availability, which further reduces agricultural productivity and may hasten the onset of HIV/AIDS in weakened HIV-positive people.

Effects of HIV/AIDS on Food Market Demand

One of the effects of HIV/AIDS is declining living standards and, consequently, a reduction in food demand through lower population and income growth. The bleakest economic outlook is for GDP growth to decline from its already meager pace (table B-3). In Kenya, for example, GDP will probably be 14.5 percent lower than projections that do not account for the effects of HIV/AIDS. In Tanzania, the annual direct medical costs and losses in labor productivity are projected to be 2 percent to 4 percent of GDP. These costs are very troublesome because public and private incomes in these countries have stagnated or declined in the last 20 years and any increase in public and private outlays on health care must come at the expense of investment in economic development. More immediately, many health care needs are likely to be unmet due to prohib-

itive costs. To put this in perspective, the average public health expenditure for the region was 1.7 percent of GDP during 1990-97 and the region's per capita GNP in 1997 was \$308; thus, annual health care spending was \$5 per capita. Even in a country such as Zimbabwe that is on the high end of the region's income, the per capita expenditure was not much more than \$10 per person. According to available reports, the life-extending drugs costs \$11,000 a year in the United States. Even at a discounted rate, their costs far outstrip health expenditures in these countries.

The implication of HIV/AIDS on the demand for food is clear. As incomes decline due to the spread of HIV, demand for food will decline, but as expected, the impact is more damaging to the lower income countries than the higher incomes. Low-income countries spend more than half of their income on food. In Africa, this share is in the range of 40 percent to 70 percent. The average income-calorie elasticity for Sub-Saharan Africa is estimated at 0.14 percent (using cross-country data). Thus, a 10-percent decline in income over the projected period will reduce calorie consumption by 1.4 percent. While this kind of decline would not affect the nutritional well being of high income countries such as the United States where per capita calorie availability is about 3,700 per day, it can have serious implication for the countries that live on the margin of the minimum calorie requirement. In Sub-Saharan Africa the average per capita calorie availability was about 2,200 per day in 1998, the lowest of all developing regions of the world. Added to the low level of calorie consumption is the quality of food consumed in the region. Cereals and starchy roots and pulses, low-cost foods, comprise 70 percent of the region's calorie consumption, while higher cost foods such as meat and dairy products that are good sources of vitamins and minerals are consumed at the lowest rates in the world.

The decline in income will have varying implications for the entire population. Skewed income distribution in these countries exacerbates the problems for the poor. In most countries, the poorest 20 percent of the population holds only 4 percent to 8 percent of total national income, while the richest 20 percent holds nearly 50 percent. This disparity in purchasing power could worsen with the spread of HIV/AIDS. The food security estimates for the year 2000 indicate that food consumption by 60 percent of Sub-Saharan Africans falls short of meeting their nutritional requirements. More alarming, however, is the depth of the problem. Food consumption of the lowest income group is estimated to be 20 percent less than the nutritional requirement in year 2000. If the income distribution worsens, the implication will be serious. In African countries, most of the poor live in rural areas. In rural areas, most farmers are subsistence producers and have limited assets to bear the reduction or loss in their productivity. For the rural landless laborer, HIV/AIDS means a severe cut in purchasing power. Also, there is no formal safety-net program to provide support for the sick and unemployed in these countries. Therefore, the family network must provide the support.

Table B-3--Social indicators in selected countries

Region/ country	Adult HIV infection rate in Dec. 1999	Per capita GNP 1998	Population below poverty line	Public expenditure on health, share of GDP 1990-97	Life expectancy at birth 1997
	Percent	US Dollars		Percent	Years
East Africa:					
Kenya	14.0	330	42.0	1.9	51
Tanzania	12.0	210	51.1	1.1	49
Uganda	8.0	320	55.0	1.9	42
Southern Africa:					
Malawi	16.0	200	54.0	2.3	43
Zambia	20.0	330	68.0	2.9	43
Zimbabwe	25.1	610	25.5	1.7	51

Source: World Development Report, World Bank, 1999.

Overall, any reduction in agricultural output and/or demand for food below the current low levels will have serious consequences for food security of the severely affected countries. Even without taking into account the side effects of HIV/AIDS, a continuation of present trends in food consumption is projected to lead to deteriorating food security in these countries. Investment and a concerted policy response by the affected governments must occur if these losses are to be minimized.

Coping Mechanism and Response Capacity

To identify coping options in dealing with the impact of HIV/AIDS on food security, one should examine forces that shape the food markets of these countries. One important characteristic of the market is that the agriculture sector is the main source of both food production and exports to finance food imports. Agricultural sectors in Sub-Saharan Africa have performed poorly and are generally characterized by (1) low productivity that is now compounded by the spread of HIV/AIDS, (2) a lack of resources and affordable technology to increase productivity, and (3) a low literacy rate that limits access to knowledge and technology as well as access to knowledge for essential behavioral change. These factors reinforce each other, and altering the situation requires attacking all three problems simultaneously.

To reduce the economic costs of HIV/AIDS, African countries must design an economic strategy in which health policy is a major component. Public policy should aim at providing information wherein health is a precondition of economic wellbeing. Currently, there are success stories in the region. Uganda has launched major preventive efforts during the last decade and has managed to reduce the rate of infection. Now, the growing awareness by officials at the international level has led to an increase in financial aid to improve and expand the preventive measures to reduce the rate of infection. This should ease costs and support national programs.

Educational messages to prevent the spread of disease, if combined with economic assistance to cope with the situation, are the most efficient ways of using new resources. For example, in response to the reduction in food supplies, nutritional education, particularly the mother's education, is important to provide information on food processing and nutritional conservation. To promote self-reliance and more sustainable responses in highly affected HIV areas, governments should encourage communities to diversify their economic activities. Many communities in Africa have started income-generating activities such as raising poultry or gardening to improve their financial situation and to help families affected by HIV/AIDS. In Malawi and Uganda, village banks give small loans to households to start their own enterprise such as market trading and honey production. In Uganda, 75 percent of households who received loans recently reported that they were caring for orphans (U.S. Agency of International Development (USAID)-Impact on HIV, June 2000).

In sum, the projected long-term food outlook for these countries shows a steady increase in food gaps, both to maintain per capita consumption and to meet nutritional requirements. Sub-Saharan Africa historically has shown the smallest improvement in average daily per capita calorie consumption. The HIV/AIDS crisis, which has already reduced the supply of labor in many countries, is projected to deepen the food insecurity problems of the region. Our projections, however, do not capture the full economic implications of HIV/AIDS, such as the decline in labor quality, medical/care costs, and costs associated with change in population structure. The challenge is new and has no simple remedy. As for the agriculture sector, strategies should aim at promoting domestic production. Unless urgent steps are taken to reverse the technological stagnation in the agricultural sector, HIV/AIDS will further deteriorate the food security problem of the region. The process, however, will be long and require consistent policies and credible institutional bodies. Given current economic and resource constraints, governments will have to

make difficult choices about HIV/AIDS care, prevention, and revitalization of their economies.

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