

THE DOUBLE THREAT OF HIV/AIDS AND DROUGHT ON RURAL HOUSEHOLD FOOD SECURITY IN SOUTHEASTERN ZIMBABWE

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This chapter provides a case study of how Zimbabwe's HIV/AIDS epidemic has contributed to shaping its ongoing food security crisis. It explores the combined impact of HIV/AIDS and drought on the food security of rural households. Fieldwork conducted in the semi-arid, southeastern region of Zimbabwe relied on a combination of ethnographic and survey-based methods. The analysis examines the implications of a double-threat from drought and HIV/AIDS by comparing data from a severe drought year in 2005 with a nondrought year in 2004. It explores household food insecurity as a product of a complex strategy for accessing food that depends on a household's resource base, its ability to exploit opportunities in the marketplace, and channel resources through its social network. The findings suggest that the combination of drought and HIV/AIDS intensifies immediate and long-term food security. However, the differences in food security attributed to HIV/AIDS are sometimes blurred by an ongoing economic crisis that has made survival difficult in general. This article contributes to studies about HIV/AIDS and livelihoods in rural Zimbabwe and has relevance for understanding of how other HIV/AIDS epidemics can erode household food security in drought prone areas. [HIV/AIDS, livelihoods, agriculture, drought, Zimbabwe]

AIDS-related disease and premature mortality exacerbates poverty and increases food insecurity by eroding the resource base of households, making it increasingly difficult for them to access food. In countries with prolonged and intense epidemics, such as Zimbabwe, the impacts of HIV/AIDS have severely weakened food and cash production activities (Barnett and Whiteside 2002). Zimbabwe's HIV/AIDS epidemic began with the first documented case in 1983, grew rapidly in the 1990s, reached its peak in 2001 with a prevalence rate of 23.7 percent, but has since declined to 14.3 percent in 2009 because of widespread behavior change (Halperin et al. 2011; UNAIDS 2010; Zimbabwe Ministry of Health and Child Welfare 2009). The epidemic affects a greater number of women; the prevalence rate among females aged 15 years and older is 59.8 percent compared to 40.1 percent among males. The epidemic is endemic in rural areas and rates of infection are roughly equal between rural and urban settings (15 and 17 percent, respectively; UNAIDS 2010). The impact of the epidemic on food security is particularly destructive for rural households located in drought-prone areas of southeastern Zimbabwe. Rural populations in this region live under conditions of chronic poverty and depend on a livelihood system

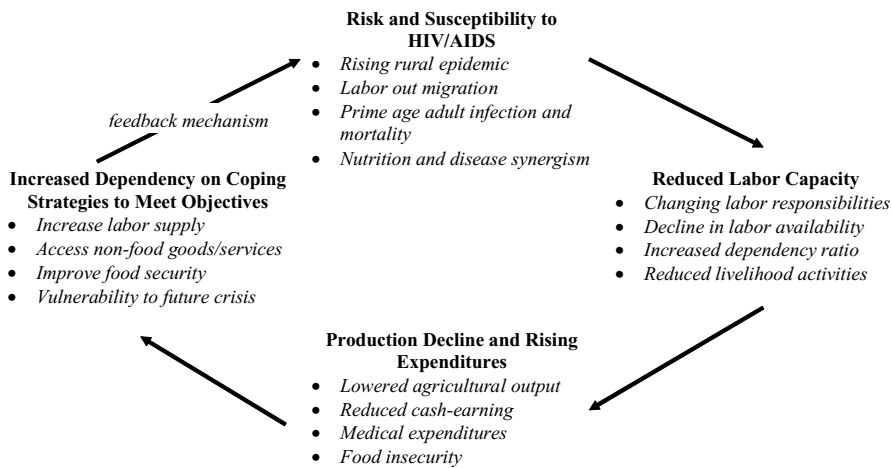


FIGURE 1. The Impact of HIV/AIDS on Household Livelihoods.

based on animal husbandry and labor-intensive, rain-fed maize agriculture to meet basic food and cash needs (Bird and Shepherd 2003).

According to the new variant famine hypothesis, AIDS-affected households are more vulnerable to food insecurity in the context of recurring droughts because the frequent drought combined with a generalized HIV/AIDS epidemic works to intensify poverty, reduce food production, and weaken the capacity of households to recover from one crisis before the next occurs (de Waal and Whiteside 2003). One of the contributions of this research is to assess the processes operating at the household level that erode long-term food security and is responsible for a new variant famine scenario in southeastern Zimbabwe. The ways in which HIV/AIDS creates vulnerability to food insecurity varies depending on how a household accesses food and organizes its livelihood activities. Although scholars recognize a causal relationship between HIV/AIDS and rural food insecurity in Zimbabwe, few studies offer a detailed analysis of how HIV/AIDS acts on labor supply, land use, and food access (Chingumira and Mathe 2004).

This article offers some insights into understanding the household-level processes by which HIV/AIDS erodes livelihoods and contributes to intensifying poverty and food insecurity in rural Zimbabwe. It explores the synergism between drought and HIV/AIDS in reducing the productive capacity of households located in a semiarid region and makes use of qualitative and longitudinal survey data to compare food security across drought and non-drought years. The analysis describes how the presence of HIV/AIDS contributes to food insecurity because of the loss of household labor, subsequent changes in land use, and declines in income-generating activities. The double crisis of HIV/AIDS and drought follows a cycle that begins with HIV infection, leading to a loss of labor that has measurable impacts on livelihood outcomes, and creating a greater dependence on coping strategies as a response to heightened food insecurity (see Figure 1).

The article primarily addresses the second and third parts of the model, which includes the ways in which HIV/AIDS reduces household labor capacity and the production

decline, declines in agricultural production, and rising expenditures on food and medical care. The conclusion section discusses the implications of this knowledge for strengthening the resilience of households to HIV/AIDS by describing how this research helped in the design of a home-based care (HBC) program for households caring for someone living with HIV/AIDS. The design of the HBC program included both health and livelihood programming to address HIV/AIDS and represents a broader shift in approaches to addressing food insecurity away from an emergency relief framework to one that examines the underlying conditions of food shortages (Baro and Deubel 2006).

SETTING AND METHODS

The setting for this research was rural villages located on communal lands across southeastern Zimbabwe.¹ Ethnographic fieldwork was conducted in four districts: Gweru, Chirumanzu, Zaka, and Masvingo, of which the first two are located in the southern part of the Midlands province and the others are part of the Masvingo province. These districts were selected because the majority of the population depends on subsistence maize agriculture, and the region is dominated by a semiarid climate making it prone to drought. Most of the districts in this study fall into ecological zones four and five where rainfall ranges from less than 450 mm/year to 650 mm/year. Few parts of the study area included areas in agroecological zone three where rainfall approaches 800 mm/year, still considered dry compared to other parts of the country, especially the north and northwest (Vincent and Thomas 1960). HIV/AIDS rates in the study area were similar to national prevalence rates, at around 14 percent in 2009 and there were no antiretroviral (ARV) therapies being offered. HIV is now endemic in rural areas whereas in the past, migration was an important risk factor. These areas also experience chronic food insecurity, and documented levels of maize production have declined since 2004 (Mazzeo 2009). Growing poverty caused by Zimbabwe's ongoing economic crisis was also a significant concern for households. The population has felt the effects of inflation through drastically reduced government services and price inflation rendering food, medicines, and basic goods less affordable. In 2008, over 80 percent of the population was estimated to be living below the poverty line, more than twice as many as in the mid-1990s (Coltart 2008). Declines in food access among households have a measurable effect on reducing body mass index (BMI), especially of women, and stunting child growth, especially children younger than two years (Hoddinott 2006; Olivieri et al. 2008).

A substantial portion of fieldwork was dedicated to understanding the organization of agricultural and income-generating activities of rural households. The vast majority of households depend on hybrid maize production to provide most of the food they consume and to generate a surplus that is sold in the market. Income generating activities mostly include informal labor sales, crop sales, and seasonal migration to large cities or internationally to South Africa. Maize is the staple food for this region and the words for food and ground maize (mealie meal) are used synonymously. Maize production is organized by individual households, or in this setting, residential units that encompass the individuals, material structures, and land belonging to a household head with complete

decision-making authority. In some instances, individual households belonged to larger compounds of related households occupied by extended kin and living on a single homestead under the authority of a patriline's eldest male. This larger unit benefits from the large pool of labor and acts as a corporate body to protect its members during times of crisis (Bourdillon 1976). Although large compounds are less common, mutual support among kin is important and, in times of crisis, individual households rely on their broader social network for food, cash, cattle, and labor.

This study utilized a mixed methods approach to capture two types of data. The first was qualitative and included a detailed description of how specific households engage in livelihood strategies under conditions of drought and while coping with HIV/AIDS. This was accomplished by collecting 30 in-depth case studies about households using semi-structured interviews. Households were purposively selected to provide a range of experiences and perspectives and the interviews covered topics such as the agricultural and income-generating activities of household members, the experience of chronic illness in the household, how chronically ill members were cared for, and the decisions of household heads in response to food shortages and acute illness episodes. Some of these data have been prepared into short passages and are included to help understand the ways in which households experience HIV/AIDS.

Statistics about livelihood activities and food security were drawn from the results of several household livelihood surveys (HLS) conducted by an international NGO in Zimbabwe.² The author of this article has worked closely with the NGO from 2004–09 to design, implement, and analyze the findings of the HLS. The information provided was used to help improve the NGO's HIV/AIDS sector work by identifying the ways in which HIV/AIDS impacts household food security and offered some new insights into how health and food security programs could be integrated (see Mazzeo 2005a, 2005b, 2006). Few studies about HIV/AIDS and food security in southern Africa have benefited from longitudinal research, even though this type of perspective is useful in identifying trends that might not be visible during a single survey year. This approach can also help to illuminate the varying pathways by which AIDS-related illness and mortality can impact livelihoods over time depending on the ecological, sociocultural and political-economic contexts in which households are situated (Drinkwater et al. 2006; Peters et al. 2008).

The design, sampling, and implementation of the HLS was consistent from year to year and each survey captured households from ten districts: Chivi, Bikita, Gutu, Masvingo, Mwenezi, Mberengwa, Chirumanzu, Gweru, Zaka, and Zvishavane. The database includes information from 3,045 households from 145 wards in ten districts. Information from the HLS have been prepared into tables and help to measure differences between households based on HIV/AIDS status and between drought and non-drought years. Measuring the impact of HIV/AIDS was accomplished by disaggregating households by an HIV/AIDS status variable. AIDS-affected households were defined as those currently caring for an adult member over the age of 18 whose chronic illness falls within the AIDS proxy definition.³ The definition also includes households who have lost an adult member to a chronic illness in the past twelve months. The classification used here to define "AIDS-affected" does not capture households providing ongoing assistance to

AIDS-affected households, households experiencing a death related to chronic illness more than 12 months ago, or households currently caring for AIDS orphans or other displaced members. Of the total sample of 3,045 households, 518 (17 percent) were affected by HIV/AIDS, 2,321 (76 percent) were not affected, and the status of the remaining 206 (7 percent) was unclear. Additionally, drought and non-drought years are represented by data collected from 2004, a nondrought year, and 2005 during a severe drought.

THE DOUBLE THREAT OF HIV/AIDS AND DROUGHT ON HOUSEHOLD FOOD SECURITY

How Does HIV/AIDS Affect Household Labor?

This analysis first examines the loss of adult labor to AIDS-related illness and mortality and its impact on agricultural decision-making (see Figure 1). HIV/AIDS and poor nutrition can have a compounding effect as it lowers a person's capacity to recover from infections, thereby leading to even further reductions in a household's food supply. Infected individuals suffering from malnourishment are more likely to develop AIDS-related illnesses that shorten the lifespan while diminishing their ability to support dependent household members (Topouzis and du Guerny 1999). Data from the survey shows that most HIV-infected adults were in their prime productive years. The highest percent of individuals living with AIDS were 31 to 35 years old, those typically responsible for supporting the household, and in 63 percent of households, this was the household head.

Nearly all households (92 percent) caring for an adult living with AIDS reported that the sickness has led to a shortage of labor because of the time needed to provide care. Household labor is affected twice over by HIV/AIDS. In addition, another adult spends significant time caring for the sick. On average, a person was bedridden for fourteen days or nearly half of the month just prior to the interview, and a substantial proportion of this group, 26 percent, was bedridden for 22 or more of the past 30 days.

People living with HIV/AIDS (PLWHA) described how chronic illness has eroded their ability to participate in agricultural and income generating activities. There was a strong and statistically significant relationship between the onset of chronic illness and the reduction or cessation of labor activities. The majority of those with AIDS (65 percent) were not involved in any form of agricultural labor. Table 1 shows the proportion of individuals involved in agricultural activities before and after the onset of AIDS. Cultivation, the most labor-intensive activity, exhibits a slightly greater reduction compared to less labor-intensive agricultural work, such as crop processing. Similar to agriculture, the majority of adults (62 percent) were not involved in non-agricultural or cash generating activities. Table 2 compares the proportions of individuals involved in 13 income-generating activities before and after the onset of AIDS symptoms. Agricultural labor sales were the most heavily affected in contrast to less labor-intensive forms of work, such as livestock sales.

Another way of measuring the impact of AIDS on a household's labor pool is by calculating a dependency ratio, or the ratio of nonworking members to working

TABLE 1. Participation in agricultural and income generating activities prior to and while living with HIV/AIDS

Participation by Activity	Prior to HIV/AIDS	Living with HIV/AIDS
Agricultural Labor	92%	18%
Weeding	91%	18%
Planting	90%	12%
Cultivation	90%	17%
Harvesting	82%	18%
Crop Processing	70%	14%
Tending Livestock	70%	16%
Income Generating Activities		
Agricultural Labor Sales	69%	9%
Vegetable Sales	67%	17%
Cereal Crop Sales	61%	8%
Non-Agricultural Labor Sales	60%	6%
Government Public Works	45%	9%
Petty Trade	43%	6%
Livestock Sales	33%	11%
Beer Brewing	32%	4%
Formal Employment	19%	3%
Fishing	16%	2%
Skilled Trade/Artisan	15%	2%
Gold Panning	15%	0%
Medium/Large Business	7%	1%

members.⁴ A comparison of the mean dependency ratio for AIDS-affected and non-affected households revealed a significant difference in the dependency ratio for AIDS-affected households (1.3 dependents per working member) and non-affected households (0.9 dependents per working member). A high dependency ratio in AIDS-affected households is likely because of an individual being unable to work because of his or her illness and the caregiving responsibilities for the sick that often keeps female labor occupied at home. The majority of sick individuals (78 percent) received care from

TABLE 2. The Primary Reason for Leaving Arable Land Fallow by Household HIV/AIDS Status, 2004–05 Season

Primary reason for leaving land fallow	Non-Affected Households	AIDS-Affected Households
Low Rainfall	47%	28%
Insufficient Manual Labor	7%	29%
Insufficient Draft Power	29%	24%
Lack of Seed	17%	19%
Total	100%	100%

another household member during the 48 hours before the household interview. On average, 16 hours over 48 hours, or eight hours per day, are spent providing care for the sick.

The following passages highlight how the onset of AIDS-related illness provides a context for understanding the loss of labor, land use patterns, and production outcomes. These case studies narratives help to contextualize the statistical measures provided above and show how the loss of labor is closely related to livelihood activities and decision-making. In most of the cases, there are clear connections between declines in productivity and a growing shortage of food and cash for essential expenditures. The first case is a female informant who describes how she and her husband, both suffering from AIDS-related symptoms, are unable to work the land they occupy. The concurrent experience of AIDS symptoms by both adults in the household was common among interviews, and in most cases the husband fell ill first.

I am 32 yrs of age and have been ill since 2003. I am so ill that I can't do heavy work. I was diagnosed TB. I am married, but my husband is not working because he is sick too. Sometimes he assists, but he can't do anything. He had TB, but it was treated. Since December, he has had severe stomach pains so nobody could work in the fields and none of us felt well enough to go for *maricho* [informal labor sales].

In this case, the field belonging to the household had little if any maize left standing because the cessation of farming activities and drought destroyed what the household had planted. She went on to explain that they anticipate that most of their immediate food will have to come from informal labor sales or they will have to wait for NGO food distributions to begin.

In a similar account, a male interviewee carefully outlined how his health problems made it difficult for his household to afford many of its basic needs. This 54-year-old male with AIDS explained how his chronic illness reduced his capacity for work to just a couple hours per day. At the time of the interview, he was being treated for TB and exhibited significant wasting in addition to swelling in his legs.

I am 54 years old, married and have two wives and five children. I used to work in a mine and left the job a few years ago when I was no longer feeling well. I suffered from herpes and had serious chest pains. Since then, I have not been working and am staying home. My health worsened this year since I developed a case of herpes and, at one point, I started vomiting blood. I sweat at night and, at times, I feel so cold that blankets are not enough to keep me warm. Today I have chest pains and a serious headache. Because of my poor health, I am unable to do anything to support my family. I cannot afford to buy [school] uniforms and books for my children. Long back, I used to keep and sell pigs but now I am unable to do such work. This season I was not well enough to plow as I used to do and now my household has a shortage of food.

I am the head of my household, but I can barely contribute because of my illness. Take for example yesterday, that day I was feeling better compared to others. I woke at seven in the morning to open the cattle kraal to let them out to graze. This was easy. Then I spent the next three hours working in a small vegetable garden. This exhausted me. When I returned home, I fixed some porridge with a cup of tea. I had to recover. After eating, I managed to repair part of my fence, but this soon tired me and I went home to rest. I slept until that

evening when I ate *sadza* [ground maize porridge] and vegetables with my family and then immediately went to sleep again.

His account of his health problems and its influence on his capacity to work were common among interviewees. Other interviewees experiencing similar health problems also became exhausted and relied on friends and family to finish their work.

How Do Changes in Household Labor Because of HIV/AIDS Influence Agricultural Land Use?

Another question this research addresses is how the loss of agricultural labor from HIV/AIDS can influence land use decisions. Decisions about land use were attributed to both the shortage of household labor and the late arrival of rains, which some people associate with a possible drought or long dry spell to come. Households in the study region combined rain-fed maize grown in outfields with small, irrigated gardens near the house-yard area. Staple cereal crops of maize and small grains were grown in outfields and depend completely on rainfall. The households interviewed in this research followed a crop rotation pattern involving three-to-four-year production cycles led by maize and followed by other crops on the same piece of land.

The cycle begins with application of bulked manure to a field, part of a household's total land holdings, because different parts are at various stages of cultivation in the rotation. Farmers grow maize for two to three years on a single parcel without reapplying manure and the following year they plant groundnuts and either millet or sorghum. Gardens occupy small areas of intensively cultivated land sometimes bordered by a protective enclosure.

Drought years in which rains fall late and for a short time place considerable pressure on households to find adequate labor under severe time constraints. Rainfall for the 2004–05 season arrived far later than expected, in December 2004 rather than in September or October. As a result, the window of opportunity to prepare fields for planting was narrow, creating a surge in the demand for draft power for field cultivation. The short duration of the first rains in 2004 stressed the labor capacity of AIDS-affected households since there is need for a greater quantity of labor in a shorter time to clear land of vegetation, break up the soil, and plow and sow seed. Cultivation and planting had to be completed before the rains ended, and households lacking draft power or relying solely on hand cultivation were at a disadvantage for planting on time. In situations where a household had to rent draft cattle, the cost ranged between US\$4–5 per acre during the 2004–05 season. On average, a household plants 1.9 acres of their arable land with maize, and if they relied completely on rented draft power it would cost US\$7–10.⁵ This is a significant outlay of cash unaffordable for most households, and, given the low yields during a drought, much of this investment may be lost.

Late germinating maize missed most of the early rainfall and faced a long dry spell in early 2005 that lasted from January to March. Maize growth was stunted and in many cases completely failed. When the rains fell again in March, crops were already damaged or dead. Those fields that survived the dry spell yielded poor harvests. A late harvest from

May to June, rather than in April, showed extremely low levels of production falling far short of preseason expectations.

Analysis of the survey data shows a significant relationship between household AIDS status and the decision to place arable land under cultivation. The decision not to cultivate in 2004 depended on several factors, most importantly labor supply, adequate rainfall at the start of the season and access to draft power. Insufficient manual labor remains the primary reason for leaving arable land fallow among AIDS-affected households while late and insufficient rains were the primary reason for nonaffected households (see Table 2). Insufficient labor was the least most influential reason for nonaffected households to leave land fallow, but was strongly associated with AIDS-affected households' status.⁶ By contrast, there is a very small difference between affected and non-affected households with regard to draft power and agricultural inputs. Thus, it appears that both types of households encounter similar obstacles in accessing draft power and agricultural inputs. Additionally, when quantity of land placed under cultivation is examined, AIDS-affected households cultivated a smaller proportion of arable land, and during the 2004–05 season AIDS-affected households cultivated an average of 65 percent (2.3 acres) of arable land while nonaffected households cultivated 74 percent (2.9 acres).

The case of a widowed female, aged 52, supporting her four children and three young grandchildren, illustrates how a labor shortage affects land use. Although her household manages five acres of land, it only cultivated one acre during the 2004–05 season. After her husband died, she continued to occupy the homestead and cared for her grandchildren. None of her husband's relatives have made any claims to the homestead or its property. Women are ordinarily not allocated land in their own right, but have access through their husbands because the Zimbabwean Constitution reserves the allocation of land to men. Land and property is customarily passed on to the immediate male relatives of a woman's late husband (Izumi 2006). In this interview, not only were her rights to occupy the land tenuous, but the deterioration of her health over the past five years has also compromised her capacity to place it under cultivation.

Five years ago, life took a turn for the worse. My health has been poor and I can't work anymore. I have to force my children to work. Work was difficult before I was sick, but now it is impossible to do anything because I am constantly sick. When my daughter died after being sick for eight months, I lost that help around the household. When my husband died years ago he left us with no cattle, no plow, no goats. After his death, we were forced from his family's land and moved to a new homestead.

She also explained that a shortage of manual labor and draft power limited her capacity to farm. Her household does not own draft animals and cannot afford to hire someone to plow for her. Cultivation was done with hand hoes and proceeded slowly. She knew the risks of overcommitting labor to cultivate too large a plot. If they could plant their maize before the rains ended, their investment would be wasted. Rather than take this risk by cultivating more land, she felt that she could safely cultivate one acre. Last season she relied on the help of her eldest son, who lives in Kwe Kwe, but since then rising transportation costs have prevented him from traveling to his mother's homestead. This

TABLE 3. Cereal Production by Household AIDS Status, 2004–05 Season

Measures of Cereal Production	Non-Affected Households	AIDS-Affected Households	P	Percent Change
Total Cereal Production (kg)				
Maize	65	75	0.048	–13%
Small Grains	12	18	0.009	–33%
Total	77	93	0.005	–17%
Per Acre Cultivated Cereal Production (kg/acre)				
Maize	39	46	0.037	–15%
Small Grains	14	20	0.063	–30%
Total	31	38	0.008	–18%

year a combination of fewer hands, lack of draft power, shortages of seed, and low rainfall has influenced her decision not to plant the majority of her land.

How Does HIV/AIDS and Drought Impact Maize Production and Income Generating Activities?

This section examines outcomes for agriculture and income-generating activities and whether AIDS-affected households are more vulnerable to drought and prone to food insecurity. Changes in labor supply and land use patterns among AIDS-affected households have been associated with a strong shift from semi-subsistence to complete subsistence in other parts of Zimbabwe (Bollinger et al. 1999; Kwaramba 1997). Overall, the findings show that outcomes in terms of crop production and cash earnings were lower for AIDS-affected households. The analysis explores cereal production, defined as all sources of grain produced by a household, since it has traditionally been an important source of food for rural households. It also examines cash generating activities, since the purchase of food on the market has become an increasingly important way for households to meet their food needs.

Data for cereal production was compared by household AIDS status for the 2004–05 agricultural season. Percent change between the two types of households for each variable provided an estimate of the influence of AIDS-related illness and mortality.⁷ The variable “total cereal production” is combined weight of maize that has already been harvested and the estimated weight of the standing crop.⁸ The data revealed that overall production was extremely low during this drought year, but that AIDS-affected households produced significantly less cereal during the 2004–05 season. Table 3 shows total cereal production was 77 kilograms for AIDS-affected households and 93 kilograms for non-affected households. When cereal production was examined per acre, there were significantly lower values for AIDS-affected households. Table 3 also reports the amount of grain harvested per acre under cultivation for that crop.⁹ AIDS-affected households produced 31 kilograms/acre while non-affected households produced 38 kilograms/acre. Low production and food scarcity was common for households during the 2005 drought, and more severe for HIV/AIDS affected households. The following description from one

TABLE 4. Income streams by household AIDS status

Income Source (Past 12 Months)	AIDS-Affected Households [Average Z\$] and [Rank]	Non-Affected Households [Average Z\$] and [Rank]	% Change	NonPar p
Cash Employment	[\$144,000] [5th]	[\$320,000] [1st]	−55%	0.001
Labor Sales	[\$170,000] [4th]	[\$205,000] [4th]	−17%	0.014
Marketing	[\$187,000] [3rd]	[\$219,000] [3rd]	−15%	0.002
Livestock Sales	[\$262,000] [2nd]	[\$196,000] [5th]	34%	0.137
Crop Sales	[\$306,000] [1st]	[\$240,000] [2nd]	28%	0.566
Total Income	Z\$1,069,000 [US\$53]	Z\$1,180,000 [US\$59]	−9%	0.002
Per Capita Income	Z\$204,000 [US\$10]	Z\$224,000 [US\$11]	−9%	0.001

household head suffering from HIV/AIDS and tuberculosis represents the experiences of others in his situation during the severe drought year.

This year we planted, but we don't have any maize from our harvest. We get help from family who stay nearby. They helped using during the plowing season and, in return, my wife helped them in their fields with weeding. From our efforts, we only managed to harvest a little maize. Because of the drought nearly everything died. Last week we took the last bucket of maize kernels to the grinding mill. From this, we were left with only ten kilograms. This can last us for two weeks. We have already eaten half and have one week of food left. If we had something to sell we would, but we don't even have any chickens to sell for food. Sometimes my uncle helps me with food, but him being a family man he has his own responsibilities.

Market purchases constitute an important source of the staple food, especially during years of low household production. The data on income suggests that the onset of AIDS-related illness and death causes a reduction in income earned and influences the types of income generating activities in which PLWHA participate. The majority of households rely on diverse income sources. This offsets the risk of failure for a single activity and helps to maintain cash flow year-round. For AIDS-affected households, it is important that these activities not be labor intensive and that all members can participate. Low household income is common in the study region, and two-thirds of households earned less than the equivalent of US\$50 during 2003, when the bottom ten percent of households earned no cash whatsoever.

Table 4 compares households by AIDS status according to cash earnings by source, total earnings and per capita earnings and compares AIDS-affected households to nonaffected households. Statistical testing of the differences by AIDS status relies on a nonparametric means test because the data is highly skewed. Each income source was ranked to establish an order of importance from greatest (first place) to least (fifth place) contribution to total reported income. The bottom of the table provides total income from all of the above-mentioned sources and per capita income for affected and nonaffected households.¹⁰ AIDS-affected households have significantly lower total income and per capita income than do non-affected households. Despite statistical significance, the actual cash amount and the percent change are not as great as anticipated. Although livestock sales do not

TABLE 5. Primary expenditures by household AIDS status

Primary Expenditure	Non-Affected Households	AIDS-Affected Households	% Change
Food	85%	79%	−7%
Medical Care	2%	12%	500%
School Fees	13%	9%	−31%
TOTAL	100%	100%	

exhibit a significant difference, the increase in livestock sales possibly reflects a type of coping strategy employed more frequently by AIDS affected households as a way to raise cash quickly. The slight increase in crop sales among AIDS affected households is mostly from vegetable sales and may suggest increased emphasis on intensive gardening and a move away from cereal crops.

Growing emphasis on cash generating activities is part of a broader regional process of “deagrarianization”—the tendency emphasize income-earning activities and move away from strategies strictly oriented toward agricultural subsistence (Bryceson 1996). Most rural households have increased efforts to diversify income sources over the past decade to meet basic expenditures amidst declining returns from agriculture. Households experiment with income sources, while retaining their subsistence farming orientation (Bryceson 2002). Typically, investments of cash and savings aim at building wealth outside of maize agriculture by starting small businesses.

Expenditures on food consume most of the cash a household generates. During a drought year, the amount of food a household purchases is far greater because of the shortfalls in its own account production. Expenditure patterns provided in Table 5 demonstrate the food, mostly maize meal, is the single greatest expenditure for most households regardless of AIDS status. Food expenditures are greater in ecological regions where rainfall is lower and the chances of crop failure are higher. Households in the drier areas of the study region, agroecological zones four and five, spend on average up to 66 percent of their total income on food.

AIDS-affected households report higher than average expenditures on medical care than non-affected households. The data show that AIDS-affected households are far more likely to report medical care as their primary expenditure: twelve percent as compared to three percent in non-affected households.¹¹ Spending on medical care includes transportation and the cost of treatment for all forms of care, including biomedical and traditional. Spending on medical care during the 30 days before the household livelihood survey (HLS) for AIDS-affected households was on average US\$8. That amount represented fifteen percent of the household’s total income for previous twelve months. If figures for the previous 30 days were extrapolated for the year, households would have spent US\$96, or nearly twice what they earned in the past year. Medical expenses represent a substantial cost to AIDS-affected households and PLWHA are not getting all of the care they need because of affordability. Other expenses, such as school fees (US\$37 in 2005), are also important and have to be budgeted with medical costs.

During interviews, caregivers expressed discontent about the medical care available in their areas. Most complaints highlight high transportation costs, the limited availability of medication, and a lack of food for those undergoing treatment. The cost of seeing a care provider was not the most expensive part of treatment, because the government subsidizes this cost and many patients purchase medical plans through clinics that further reduce costs. An interviewee described the major expenses come from patient transport, in-home care, and medications.

People will only go to the clinic only when they are seriously ill. Some people walk up to fifteen kilometers from their homes. Those who are bed ridden have to be taken to the hospital in scotch cart or even a wheelbarrow. Sometimes they are carried to the main road and from there they hire a car or truck to the hospital. When they get to the clinic there are no drugs and referral hospitals are too far and too expensive. Many of the patients who seek care for their symptoms do not have enough food, yet the tablets they are required to take need them to eat.

What Are the Differences in Food Access during Drought and Nondrought Years?

The last part of the analysis presents a comparison of household food security in 2005 (grown during the 2004–05 agricultural season) with the previous year (grown during the 2003–04 agricultural season). The purpose is to demonstrate how the presence of drought combined with HIV/AIDS in the study region places AIDS-affected households at heightened vulnerability to food insecurity. Households access maize meal through a combination of production, Grain Marketing Board (GMB) purchases, nonofficial sellers, in-kind labor exchange, and reciprocal gift giving through one's social network.¹² The comparatively lower food security situation of AIDS-affected households can be attributed to a combination of labor loss, declines in cash earning, increasing expenditures, and reduced agricultural output.

Table 6 compares the quantity of cereal and its proportion to total household cereal supply for each source. The greatest difference between the two years was the contribution of agricultural production. The 2004 harvest was not affected by drought, and it accounted for 465 kg or 59 percent of total household access to cereal. Severe drought the following year reduced production in 2005 by 80 percent and farming accounted for only 92 kg or 17 percent of cereal access. In 2005, households made up for shortages in agricultural production by increasing local market purchases (also called nonofficial), relied more on labor sales, sourced more food through gifts or borrowing, and relied on a variety of other food access strategies.

The data in Table 6 shows that the proportion of cereal each source generated was nearly identical, however, the quantity from each source was less for AIDS-affected households. In other words, during a non-drought year, AIDS-affected households employed the same strategy for sourcing food, but they were not as successful as nonaffected households. During a drought year (2005), cereal was difficult for all households to source and the results show a more similar cereal security situation. However, the greatest differences are found in the proportion each source of cereal contributed to total access for the year. AIDS-affected households relied more on gifts of cereal or borrowed cereal.

TABLE 6. Sources of Ground Maize Meal, Quantity and Proportion of Total Access, for Non-Affected and AIDS-Affected Households During 2004 (non-drought) and 2005 (drought)

Source of Ground Maize Meal	2004 (non-drought)						2005 (drought)						% Change for All Households, 2004 and 2005			
	Non-Affected			AIDS-Affected			Non-Affected			AIDS-Affected						
	Households			Households			Households			Households						
	kg	%		kg	%		kg	%		kg	%					
Agricultural Production	475	60%		438	59%		93	17%		76	14%		92	17%		-80%
Local Market	92	12%		93	13%		126	23%		109	20%		124	23%		33%
Grain Marketing Board	153	19%		124	17%		119	22%		106	20%		117	21%		-16%
On-Farm Labor	30	4%		32	4%		64	12%		63	12%		64	12%		83%
Off Farm Labor	19	2%		18	2%		33	6%		36	7%		33	6%		74%
Gifts & Borrowed	18	2%		22	3%		71	13%		108	20%		75	14%		226%
Other	9	1%		11	1%		44	8%		44	8%		44	8%		340%
Total	796	100%		738	100%		550	100%		542	100%		549	100%		-30%

Also, purchased foods from local markets and the GMB contributed to less of total access.

Although gifts and borrowing of food ranked low in terms of overall food access, their value for survival should not be underestimated since this means of obtaining food is an important safety net for households with no means of self-support. Most instances of food gifts occur between kin, especially close kin such as children or grandchildren. Although friends may help out with cereal, kin supply purchased groceries or non-cereal items. Friends are reluctant to give purchased food commodities; this has to do with the cost of these goods, whereas cereal can be grown or earned through labor sales. Kin are obligated to support one another and are willing, therefore, to spend cash. Support from traditional figures may be obtained from the Chief through the *zhunde ramambo* (chief's granary). A chief designates agricultural land to cultivate maize and the harvest is set aside to support disadvantaged households. A chief acquires labor from households that fall under his traditional jurisdiction and the chief's household provides seed and draft power. The *zhunde ramambo* is another social safety net and source of food during times of scarcity.

HIV/AIDS HOME-BASED CARE PROGRAMMING

The findings of this research have influenced HBC programming by encouraging the inclusion of a diverse food aid package, health supplies that include personal hygiene first aid and medical supplies, capacity building for in-home, primary caregivers. It recognizes that HIV/AIDS prevention and treatment cannot be isolated from other household objectives such as food, education, income generation, and agriculture. The core of the HBC program focuses on the provision of primary care by both in-home caregivers and community based caregivers. Community caregivers received extensive training in HIV/AIDS, opportunistic infection, and how to provide primary health care in the patient's home setting. The community caregivers make weekly visits to program households to deliver hygiene supplies, health kits, and to provide some education for in-home caregivers. Another core component of the HBC project are peer educators, some of which also serve as community caregivers, who provide HIV/AIDS awareness education for their community. Finally, all HBC households are enrolled into a monthly food aid distribution that includes the standard food aid commodities (cooking oil, beans, corn-soy blend cereal, and ground maize meal) and additional food items that enhance the nutritional value of the package (peanut butter, canned fish, and a variety of vegetables).

In addition to the core components of the HBC program, HIV/AIDS affected households were enrolled in other programs operated by the NGO because they were considered vulnerable to food insecurity. Research from other parts of southern Africa confirms the connections between livelihood insecurity, HIV/AIDS, and environmental change and emphasizes the importance of capacity building and the strengthening of livelihood activities for HIV/AIDS-affected households (Ziervogel and Drimie 2008). The programs offered to households had more of a livelihoods emphasis and included a community

gardens project, distribution of agricultural inputs, and conservation farming. The community garden project was directed at female-headed households and provided shared labor, land, inputs, and irrigation sources for the production of vegetables intended for consumption and sale. One of the unanticipated outcomes of the gardens was that they served as a social space for women to exchange ideas and offer support to one another. Another program targeted to HIV/AIDS affected households was the distribution of agricultural inputs, maize and bean seeds, as a means for reducing household expenditures on these items. Complementing the distribution of seed was a conservation farming program that offered households more techniques about maize farming that is better suited for a dry climate and poor soils. Conservation farming is a long-term approach to strengthening livelihoods in rural Zimbabwe that has been demonstrated to be effective in similar parts of the country (Frost et al. 2007).

The HBC program encountered some of its most difficult challenges when targeting aid specifically to HIV/AIDS affected households. Selective targeting of affected households during a widespread food crisis created tensions between households. During the 2004–05 season drought, local leaders and the communities resisted proposals to conduct selective targeting of program resources. For example, some community members refused to work with AIDS-affected households in agricultural initiatives. Discrimination against HIV/AIDS infected individuals were the foundation for refusals. Some of the arguments included that HIV/AIDS infected households did not deserve help or were physically incapable of following through with project objectives. Experiences of discrimination by PLWHA were common and consistently raised during interviews. A female informant explained,

Some prefer to fetch water from a different well than the one I drink from. When neighbors come to visit me most do not greet me with a handshake, they just ask you how I am feeling while sitting or standing far away from me. If I sell fruits and vegetables, they are not bought since people are afraid that they might catch the disease. The only way that I can sell my fruits and vegetables is sending someone to do that for me.

AIDS-related chronic illness increased a household's dependence on its social networks, especially those with lineage elders and wealthier households. Communities argued that assistance should also be given to people providing help as a way of strengthening natural safety nets. They were concerned about the sustainability of social networks forcing increasing demand and general economic insecurity. Finally, many of the HIV/AIDS affected households were dissolved after the deaths of the household head and other households were obliged to absorb members, child orphans, and sick adults unable to care for themselves. It was difficult and resource intensive for the HBC program to track the movement of individuals and deliver program resources.

CONCLUSION: NEW VARIANT FAMINE IN ZIMBABWE?

While the food security situation of most southern African nations has recovered since 2004, the food crisis affecting Zimbabwe persists. In 2009, the country produced

1.4 million metric tons of cereal to meet a national requirement of 2 million. Shortages of foreign currency and the rising cost of food have prevented the nation from importing sufficient food to satisfy its domestic requirements and the nation has come to rely on foreign food aid to bridge that gap. Even though Zimbabwe's food shortage has recently somewhat ameliorated because of short-term improvements in crop production and a momentary stabilizing of the economy, US\$54 million in food aid was requested in the 2010 UN appeal and the World Food Program estimates that 1.6 million people will require food aid (United Nations 2010; World Food Program 2010). Critics of traditional food aid approaches argue that U.S. political-economic interests have guided emergency food relief leading to a mismanagement of aid resources and potential damage to long-term food security. Approaches to addressing HIV/AIDS in southern Africa need to be responsive to local context and incorporate knowledge about the particular ways in which households utilize available human, natural, and economic resources to pursue a livelihood strategy for the purposes of securing food and meeting other needs (Marchione and Messer 2010).

Undoubtedly, the presence of HIV/AIDS in chronically poor and drought prone areas will accentuate the current food crisis among households affected by HIV/AIDS. This article has examined several of the mechanisms by which HIV/AIDS in the context of drought acts on labor, land-use patterns, and income-generating activities to intensify poverty and food insecurity among rural households. The analysis provided quantitative and qualitative data from drought and non-drought years. In the context of an agricultural, subsistence oriented, livelihood system, the onset of AIDS initiates a devastating crisis for households because it most often strikes adults of prime labor age who are often household heads and decision makers. AIDS-affected households have scaled back cultivation to accommodate a reduced labor force and restrict cash earning activities to those that require less labor and capital input. Subsequent declines in production because of reduced agricultural and income activities have reduced the ability of AIDS-affected households to obtain sufficient food to meet their consumption needs. These households are significantly more food insecure and engage in coping strategies, such as livestock sales or relying on social networks, to obtain food. Some of these coping strategies, such as divesting livestock or assets, further reduces resilience to future crises and permanently damages the productive capacity.

One of the central questions this article set out to answer is if Zimbabwe faced a 'new variant famine' as a result of production losses attributed to a concurrent HIV/AIDS epidemic and drought (de Waal and Whiteside 2003). Although this article has demonstrated how HIV/AIDS erodes rural livelihoods and reduces food security, the data show that some of the differences in production outcomes and food access are not as great as would be predicted by the new variant famine hypothesis. Rather, the findings suggest that other factors in addition to HIV/AIDS, such as widespread crop loss and rises in food prices, also play a significant role in creating rural food insecurity. However, projects that target HIV/AIDS affected households should still account for the ways in which chronic illness impacts aspects of production and consumption. Based on the findings of this research, strengthening the resilience of HIV/AIDS affected

households to drought and other crises should combine both health and livelihood style interventions.

The findings of this research were used by the international NGO to help design its home based care (HBC) program for households caring for individuals living with HIV/AIDS. The approach to HIV/AIDS in this model is holistic and includes prevention, care, treatment, and mitigation. The design of the program reflects a close relationship between the research and practice found to be highly effective by other researchers (Loevinsohn and Gillespie 2003). Clearly, a one-size-fits-all approach when it comes to HIV/AIDS programming does not accommodate the diverse livelihood strategies found across the region. Programs benefit from diversified interventions that account for variability across different types of households as the relationship between HIV/AIDS and production activities vary (Swaans et al. 2008).

In conclusion, this research demonstrates the connection between research and its ability to inform household based responses to HIV/AIDS. This communication of research findings to HBC programming in general is critical to mitigating the immediate impacts of HIV/AIDS in drought prone areas but also important in the long-term sustainability of rural livelihood strategies. This case study adds to broader findings from other researchers working in the region and promises to make a positive contribution to effective programming. In particular, the above research calls for greater attention to improving the productive potential and sustainability of livelihood activities in areas where HIV/AIDS and drought pose an ongoing threat to rural populations.

NOTES

1. Communal lands were established by the Communal Lands Act of 1982 and according to this act, all land is the property of the State and controlled by the President. A combination of government and traditional authorities entrust parcels of arable land to individuals for agricultural use, but individuals cannot legally purchase or sell land. Communal lands, for the most part, consist of the poorest agricultural areas in the country.

2. The identity of the international NGO has been kept confidential at the request of the organization.

3. For the purposes of AIDS surveillance an adult is considered to have AIDS if at least two of the following major signs are present in combination with at least one of the minor sign, and if these signs are not known to be because of a condition unrelated to HIV infection (Grant and De Cock 2001). Major signs include weight loss; Chronic diarrhea for >1 month; Prolonged fever for >1 month (intermittent or constant); Persistent cough for >1 month for those diagnosed with TB. For the complete list of minor signs see Grant and DeCock 2001.

4. Dependency ratio is calculated as (number of members not working or contributing to the household) divided by (number of members who contribute labor). The number of working members was provided by the head of household, who was asked to determine "the number of household members who were making a significant contribution to the upkeep of the household through some form of work."

5. Arable land is land suitable for agriculture. Not all of a household's land is appropriate for farming, such as the land occupied for structures or land that is designated for livestock grazing.

6. $\text{Gamma} = 0.73$, $p = 0.000$

7. Percent change calculated as $[(x_1 - x_2) / x_2] * 100$ is used to demonstrate the impact of AIDS on households [x_1 (AIDS-affected households) and x_2 (nonaffected households)].

8. The weight of postprocessing cereal from standing crops was estimated by interviewers based on an estimate provided by the household.

9. Production per acre (kg/acre) = amount of crop (kg) / area of arable land cultivated for that crop (acres).
10. Per Capita Income = Total Income / Number of Household Members.
11. $\Phi = 0.17$, $p = 0.000$
12. Maize is a controlled commodity in Zimbabwe and can only officially be purchased and sold by the government's Grain Marketing Board.

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