

Staff Paper

**Collection and Analysis of Cross-Sectional Household
Survey Data on Rural Morbidity and Mortality:
Lessons Learned from Initial Surveys**

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ABSTRACT

In southern Africa, HIV/AIDS is considered to be a critical factor conditioning rural economic development, exacerbating already difficult problems with climatic variability and poverty. In their efforts to use household surveys to obtain information on rural adult mortality and morbidity and their effects on rural household livelihoods, Michigan State University researchers and their local collaborators in the Ministries of Agriculture of Rwanda (MINAGRI) and Mozambique (MADER), have learned various lessons. Using household surveys to estimate the impact on the households requires careful attention to detail as well as skilled use of econometric tools. The difficult modeling issues involved in such estimation is not be discussed in this paper. Rather, we focus on the basic data collection required and the formulation of effective survey questions. Based on the survey instruments used in these two countries, suggestions are made to improve the ability of researchers to estimate mortality rates, evaluate changes in demographic composition of the households, and elicit information from households regarding incidence of illness and death, their effects on household livelihoods, and the households' response strategies. This paper provides recommendations for future survey instruments to improve the knowledge base so critical for the design of interventions.

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(34 Pages including Annexes)

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Collection and Analysis of Cross-Sectional Household Survey Data on Rural Morbidity and Mortality: Lessons Learned from Initial Surveys

1 CONTEXT

As HIV/AIDS prevalence continues to rise in most countries of sub-Saharan Africa, epidemiologists are working to understand the extent of the epidemic in rural areas. With the lack of health posts in many rural parts of southern Africa, extrapolation from the few existing rural centers has been relied upon to provide information on rural HIV prevalence. Current estimates of HIV prevalence in most countries of sub-Saharan Africa are unable to disaggregate national and/or provincial HIV prevalence estimates to obtain accurate estimates for rural areas. Thus, there are growing questions about the use of samples from women at antenatal clinics to extrapolate to the population (Rehle and Shisana 2003). The recently released HIV prevalence statistics for Mozambique (Grupo Técnico, 2003) demonstrate just such a weakness.

Very few randomly selected, broad-based surveys on HIV prevalence have been conducted, and the need for medically trained enumerators and costly testing of blood or other samples make such surveys prohibitively expensive. Recent Demographic and Health Surveys (DHS) are beginning to do this, but they rarely include any more information than age and gender of the person involved, thus the databases have limited analytical value. However, the need for specific information about mortality and morbidity in rural areas of sub-Saharan Africa will become vitally important not only for health sector programs but also for programs in agriculture and rural development in general.

In response to the demand for current information on rural morbidity and mortality in sub-Saharan Africa, Michigan State University (MSU) researchers have worked with host-country partners to combine information across a number of different aspects of household welfare in one national survey – information that is typically collected in isolation in un-linked surveys. For example, national DHS contain important information on household demographics and health, but these surveys seldom contain insights on household assets, livestock and crop production, agricultural and off-farm incomes, and expenditure behavior. Likewise, national income and expenditures surveys have typically not contained detailed health and mortality information. As a result, most large-scale data collection activities in Africa have not been able to provide a nationally-representative picture that links household and individual economic attributes with health and mortality status.

The approach of MSU researchers has been to work with national statistical organizations and other local groups to include a demographic/health/mortality component on national surveys

primarily oriented toward agricultural and income information, in order to examine empirically the impact of prime-age adult mortality on rural households' agricultural production, cropping patterns, asset levels, and incomes. Because of this eclectic approach to adding on to existing national surveys, the surveys differ as to style and content across countries, reflecting the priorities and funding constraints in each country. The differences across survey instruments result in subsequent advantages and disadvantages for analysts.

MSU researchers have learned various lessons in the process of designing and implementing such survey instruments to obtain estimates of rural adult mortality and morbidity. When combined with other household information, such estimates can provide valuable information on the effects of HIV/AIDS in rural areas, particularly on agriculture (Donovan, *et al.* 2003; Yamano and Jayne, 2004; Mather *et al.* 2004). However, using household surveys to estimate the impact of adult morbidity and mortality on affected households requires careful attention to detail as well as skilled use of econometric tools. Those modeling issues will not be dealt with here. In this paper, we focus on the basic demographic data collected and how the survey questions are formulated. Instead of summarizing survey experience from the many studies that are now being conducted or have recently been reported, this paper discusses our experience with the surveys implemented in Mozambique and Rwanda, in order to improve the quality of future research as more and more researchers go to into the field. While the survey instruments themselves (see annexes) may be helpful in the design of instruments for future research, this paper provides a summary of the advantages and disadvantages of the instruments, based on our recent experience with them, as well as suggestions for improvements.

2 OBJECTIVES OF THE ADULT MORTALITY SECTIONS IN RURAL HOUSEHOLD SURVEYS

In many countries, large sample rural household surveys are often guided and undertaken by or for a specific branch of government, for example the Ministry of Agriculture as in Mozambique and Zambia, and shed light on vital aspects of agricultural productivity, cropping patterns, and a range of other aspects. In addition, these surveys may be modified at relatively low marginal cost to gain insights on the presence and impacts of HIV/AIDS in rural areas, as well as premature adult death for any cause. To do this well, researchers will need to develop new tools, learning lessons from the health and demographic literature, as well as from the experience of others.

To put the surveys in context, the objectives of including demographic sections concerning household death and illness in the current surveys were the following:

1) Determine the prevalence of prime-age¹ adult death, especially death due to illness This can be useful for two reasons. First, information on rural mortality rates is scarce in many countries, as the one source of rural health statistics for many countries, the Demographic and Health Survey (DHS), typically focuses on mother and child mortality. Second, given information collected regarding the deceased individual and the affected household, prevalence (of PA death by illness) can be analyzed by province/region, gender of the deceased individual, household income quartile (post-death), and other factors. Such information can be valuable for the targeting of HIV/AIDS educational and mitigation programs.

2) Understand how the households were affected and how they responded As will be highlighted below, it is critical to be clear on the objectives prior to designing a survey instrument. Many times, the agency who funds research wants specific questions answered: 1) Are households switching land area to less labor intensive crops? 2) Are households sending children away and who takes care of them? or 3) Are households losing access to land? If something is considered a critical research question, it must be asked directly in a clear way and in context so that the response is unambiguous. Designing this efficiently is a challenge.

3 METHODS

3.1 Panel surveys

Where a baseline survey has been done, a panel can be developed with intervals of 3-5 years, to capture the changes in households over time. For examples of this research see Yamano and Jayne (2003), Mazhangara (2004), and Beegle (2003). This dynamic look has many advantages, but one major disadvantage. In the absence of a baseline, researchers must wait 3-5 years to get information and then model over time. This time lag between when information is needed and when it can be available is unsatisfactory to most policy makers and so alternatives are needed. The research in Mozambique and Rwanda follows that vein, responding to current needs with valuable information, although limited by reliability of recall and the use of modeling tools.

One issue to recognize with these surveys is that of attrition and missing household bias. The households that are hit the worst by HIV/AIDS and other adult illnesses may be the most likely to dissolve and thus will disappear between samples. This will lead to a bias in results, underestimating the effects of HIV/AIDS on households. Alternatively, the wealthiest households may be the most mobile, and there may be over-estimates of impacts. Recent

¹Prime age is used to refer to the ages in which an adult is in their “prime” for both income-generation and for sexual activity. This age is defined differently by each country, but tends to be near 15-49 or 15-60.

research indicates that it may not be as serious a problem as may be thought (Alderman et al. 2001), but the evidence is still limited. Thus for all households who cannot be found from one period to another, strong efforts should be made to find out what happened to the family and whether or not adult illness was involved and current household status.

3.2 Cross-Sectional Surveys with Recall

Since cross-sectional surveys are based on a single interview, recall is used to capture historical data on deaths and other demographic events, such as new arrivals, departures, and illness. Recall periods may vary according to the aspect that is being assessed. In the case of major events (such as a death), 4-5 year recall may be fairly reliable. In the case of income, production, and other aspects, a one-year recall may be the longest that will obtain reliable answers. For consumption recall of small, constant quantities, even one week may be too long. An important advantage in multiple-year recall on death information is that, given the survey sample size and HIV prevalence in the country, the number of deaths within the year of survey implementation may not be very large, but over time, the number will be greater, enabling analysis without extremely large sample sizes.

For example, the surveys discussed here are random samples of rural households with about 5,000 households in Mozambique and 1,500 households in Rwanda. In Rwanda, the recall period of three years was fairly short but was selected to avoid the main period of adult deaths due to the genocide and immediate aftermath. Even so, one province, Gisenyi, had a high number of murders in the first year of the recall, related to the civil unrest and continued conflict in the Democratic Republic of the Congo. In Mozambique, a recall from January 1999 was used (about 3.75 years, depending on the date of the interview in 2002). However, even with multi-year recall on deaths, the resulting sample numbers on adult deaths was fairly small (only 73 adult deaths due to illness in the Rwanda sample, 50% female; 217 adult deaths due to illness in Mozambique, 51% female), thus limiting the analyst's ability to disaggregate and study adults or households with specific characteristics.

Sample design necessarily includes the calculation of the numbers needed to get significant results when breaking down by different criteria (Levy and Lemeshow (1999): death by gender, role in the household of the person who died, region of the country, or other classification, The numbers will depend on HIV/AIDS prevalence in the country, as well as the "age" of the epidemic and other factors that influence adult illness and death in a region. An alternative would be to stratify the sample population and purposively select more households with an adult death or perceived probability of a death, based on earlier work.

As with panel data surveys, there is potential bias in the sample, since some severely affected households will no longer appear in the sample if they have dissolved as a household. Orphan children and family members from affected households may be identified in other households in the sample, so some information may be available, but it will not be possible to accurately estimate the numbers of households that have dissolved with this type of survey. Any estimate of impact on households will necessarily be underestimated, however the extent of this problem remains to be evaluated.

Ideally, researchers will be able to revisit households at various later periods (every 3-5 years) and then ask about the intervening period to find out what happened and assess the impacts over time. Thus, an early cross-sectional survey may serve as a baseline for a future panel survey, as indicated above.

3.3 Use of Other Research Methods

The research described here involved relatively large sample, formal surveys. Other research methods may be used to complement this information. For example, Mazhangara (2003) worked with collaborators in Malawi to combine formal surveys with focus group and informal individual interviews that would shed light on community level and cultural issues. For the Mozambique work cited here, there was a community level questionnaire directed to community leaders asking about physical infrastructure, availability of services, and other aspects that may be important in rural household income, but also related to HIV vectors and prevalence. Recent work in Mozambique that evaluated the effectiveness of home-based care combined semi-structured interviews with focus groups as well (Breslin 2003). Whiteside et al. (2002) used obituaries in the newspapers to evaluate changes in adult death patterns in Swaziland. Costly large sample surveys are not the only source of information, but the selection of method should be done recognizing the contributions and limitations of each.

4 INFORMATION TO BE OBTAINED:

4.1 Demographic information

There are various demographic concepts that are relevant to this research, including mortality rates, excess deaths, and dependency ratios. Adult mortality rates are often estimated, and comparable statistics can be generated with the formal surveys if sufficient information is gathered at the household level on each individual during a given recall period. An annual mortality rate per 1,000 person years indicates how many people died out of 1,000 people that were counted for a given year.

Prevalence rates for HIV are often calculated as a percentage of adults infected with the virus. There is a lag between changes in prevalence rates and changes in mortality rates. Generally, current mortality rates reflect what the prevalence rate was 5 to 8 years earlier, depending on how quickly people transition from HIV to AIDS. When making comparisons, particularly regional ones, regions with high current HIV prevalence may not have high current adult mortality rates, if the epidemic is in its early stages in the region. In Mozambique, there was a high significant Spearman correlation of 0.60 between rural mortality rates by province in the survey over the 3.75 year period and the estimated provincial prevalence rates (Mather et al 2004).

Much of the AIDS literature indicates that mortality rates will increase (and life expectancy decrease) differentially for men and women as the epidemic progresses. If the demographic information is collected thoroughly, mortality rates can be estimated for the different age groups by sex. In most countries, women tend to die younger of HIV, reflecting what many see as the vulnerability of young women and the higher risk of exposure when young (Walker and Gilbert 2002). Women may also have greater risk of dying young due to stress from maternity or other sources. Where the epidemic is increasing, the rates are generally increasing for young women (15-24 age group, for example) and for slightly older men (25-49 age group), if previous trends still hold. Determining these rates can help link the rural surveys with the AIDS literature, to validate the survey method, but also to provide information to policy makers.

With respect to mortality rates, the current MSU and collaborator surveys did seem to underestimate the infant mortality rates. With HIV/AIDS, infant mortality rates can increase dramatically, but it is difficult to measure this accurately with a recall survey of family members. There are various reasons for this, including cultural. As one researcher in Mozambique indicated, in some cultures, if a child dies before it is named at the official ceremony, it never officially existed and thus would not figure as the death of a child. Thus, care will be needed if infant mortality is a key aspect of the research. We did not pursue this and thus researchers would need to find other sources to guide them.

Researchers' ability to compare the household and individual findings in this work with other population statistics commonly available depend greatly on the quality of the demographic information contained in the survey, as well as the representativeness of the sample. For example, to get mortality rates, you need to be able to calculate exactly how many "person years" there are as well as how many deaths occurred for every 1,000 person years. If the death recall goes back three years, you need to establish exactly how many people (by age and gender) were in the household during the full 3 years. Thus, survey questions must elicit information on departures, regardless of reason, arrival of new people, and return of former household members, so that for each individual, the number of months present in the households out of the full period

can be estimated. In Mozambique, the survey does not accurately determine when people who died arrived in the household, leaving analysts unable to determine if the person arrived ill, needing care before death, or the date (month/year) of arrival of those who joined the household since January 1999.

There are also possible problems with recalling all the members of a household who came and went during a period of several years. In both Rwanda and Mozambique, there was a high degree of change in the households, with a wide range of reasons given for people entering and leaving a household, including reasons related to death but also employment, studies, the search for better land, and marriage. An enumerator must carefully walk through the period with the families to avoid missing people, capturing in the survey instrument all movements of people into and out of households, while documenting the reasons for movement. In Mozambique and Rwanda, the demographics did not incorporate members who might have come and gone in the middle of the period.

Excess deaths may be estimated using these mortality rates, and hypothetical “without AIDS” mortality rates which can be found in the literature (Doctor and Weinreb 2003). In the prime ages, few deaths are expected in the absence of HIV/AIDS. When deaths are higher than expected, those deaths may be used to proxy the “excess deaths” that occur due to the presence of HIV/AIDS.

Dependency rates or conversion to adult equivalent measurements are also frequently used. These numbers are used to understand the relationship in consumption or labor between those in the family who are of prime working age and have greater consumption needs from those who are children and elderly, less likely to contribute substantial labor and with lower consumption needs. For each of these, basic age and gender information for each member of the household are needed. Health status enables the differentiation between prime age members who are able to work and those who are ill and need care, for those needing care should be considered “dependents” in a modified dependency ratio.

4.1.1 Characteristics of the person who is ill or has died

Research indicates that there are various aspects of the person who is ill or has died that may be important to understanding how that person’s illness and death affects the household and how the household reacts and deals with the stress. For example, in Rwanda the death of a female head or spouse tended to result in a new adult female entering the household, whereas the death of a male head did not tend to result in a new adult entering the household. This paper does not go into all the difficulties in defining “household” and “role” as those topics are treated in other

literature (Deaton 1995; Guyer and Peters, 1987).

The main aspects concerning the person directly affected, as cited in the literature, include:

- C Gender
- C *Age at time of death* (not age group)
- C Relationship to current head of household as well as to person who was head *at time of death*
- C Role in the household in relation to the household head *at time of death* (household head, spouse, son/daughter, orphaned child, relative child, mother/father, etc.)
- C Primary activities of person who died, *when still economically active* (particularly important to ask this carefully as people with prolonged illness may be considered to be “inactive” with no profession)
- C Education level
- C Period unable to work or period chronically ill

Ambiguity on the period of illness and how to define a prolonged illness may lead to difficulties in analysis. In Mozambique, for example, the wording of the question left in doubt whether “three months out of the past twelve months ill” meant three consecutive months or any three months out of the previous twelve. Also, was “prolonged illness” or “chronic illness” equivalent to “unable to work” for long periods, or could someone be chronically ill and still working some of the time? Specificity in the wording and definitions would have avoided some possible difficulties in interpretation.

Insufficient information to identify role in household of person who died (is ill) or other characteristics will limit the ability to draw conclusions on effects and strategies. Some questions may be ambiguous. For example, in Mozambique and Rwanda, the question was asked about the “relationship to current household head”, but it left in doubt whether the “head” was the current head or the person who was head at the time of the death. Thus, it cannot be determined if the person who died was the household head or spouse when they died, a key piece of information. In Mozambique, miners returning from South Africa were considered to be a major possible vector for HIV transmission in rural areas of the south, yet the former occupation of deceased individuals was not specifically identified.

4.1.2 Nonmembers

Another issue involves aspects of people who are not currently household members, yet maintain links with the household. Their socioeconomic characteristics may be important in understanding what is happening in the households. These aspects may include the

characteristics cited above, but also may include more detail on activities. Given the established links between migrant workers (such as miners) and HIV transmission from one area to another, information on household migration and remittances would be beneficial to any study investigating the socioeconomic correlates of adult mortality and morbidity, for nonmembers as well as members. In Mozambique, if there was a death of a non-member who had previously been sending remittances, it was not captured. The definition of “household” is key here.

4.1.3 Orphans

The current research did not directly address the issues related to orphans. In presentations, questions have arisen as to whether orphans have the same access to education as the natural born children of household heads, if they are forced to work more in the fields, if they have less access to health care, and other aspects. There are pieces of information that begin to capture the presence of orphans in rural households, but sample numbers may be too low to capture all the movements of children. The design of the demographic sheet and an arrivals sheet can be focused to understand the dynamic of children leaving and entering households.

A few key questions to be asked about all children:

- Age and sex of each child

- Relationship of each child to head of household and to spouse of household head

- Reason when and why a new child member arrived

 - Status of mother and father for each child (if the mother is alive; if she died, when; relationship to others in household if any)

- Level of schooling for each child and current school enrollment

- Household responsibilities of each child

If orphans are an important aspect of the research, the sample design may have to include stratification for orphans in able to get sufficient numbers for analysis. Achieving this might be difficult unless a household listing includes presence of orphans.

4.2 Causes of Death and Verbal Autopsies

The Mozambique and Rwanda surveys have used a simple classification system for cause of death, attempting to separate illness-related deaths from accidents, murders, death in child-birth and other causes of death that are unlikely to be associated with HIV/AIDS. Given that the enumerators are lay people, not trained health workers, simple questions directed to a household member were viewed to be the most appropriate.

For instance, in Mozambique, respondents were asked the main cause of death for each person who died, given the following options:

- C Non-prolonged illness
- C Prolonged illness (defined as at least 3 months unable to work before death, but some ambiguity in definition)
- C Death in childbirth
- C Accident
- C Murder
- C Other (to be specified)

Pre-testing on causes of death, in particular, is important. Since HIV/AIDS will become more and more known as time goes on, it will be important to explicitly include it in any list or in post-coding of “other” reasons for death, as it can serve as an indicator of public openness and awareness of AIDS. When AIDS is openly discussed and mentioned, it is a sign that knowledge is increasing. Note that the section on causes of death is not looking for medical accuracy, as most of the people who die may not have even seen medical staff, but rather the households perception of the cause of death, based on the physical symptoms that they observed.

Problematic answers on the cause of death, particularly the response “witchcraft”, make it difficult to classify a death. While neither survey here included witchcraft as an option, enumerators need to be coached to go beyond this as a response when it occurs. This does not mean that they must reject the answer saying that it could not have been witchcraft, but rather they need to probe as to the symptoms that the witchcraft took, the outward signs that led to death. This will clarify people who died due to a snake bite, for example, as opposed to those who died of illness slowly over time. In some places, the wasting away associated with AIDS is associated with witchcraft, so this issue is critical to address directly and openly.

Since policy makers are requesting information specific to HIV/AIDS, there have been some attempts to try to identify deaths due to AIDS. This is complicated, for several different reasons. A major problem is the lack of health care facilities and more specifically testing facilities to identify the presence of HIV and the cost of such testing, as well as potential participant unwillingness to be tested.² With or without testing, some illnesses are considered opportunistic diseases that take advantage of the weakened immune systems of persons with AIDS. Tuberculosis is one such disease which would be identified as the cause of death, although the weakened immune system with AIDS may have enabled the disease to become a killer.

²See the Nelson Mandela HSRC Study of AIDS (Shisana and Simbayi 2002) for an example of a recent large sample study with seroprevalence testing from South Africa.

In Mozambique, for illness-related deaths, the household was asked to identify death due to a prolonged illness as compared to death due to a non-prolonged illness. For prolonged illness, the person was to have been ill for at least three months prior to death. The definition of “prolonged” left some room for doubt as to whether the illness had to be incapacitating (“unable to work”) or not. Regardless, we have not yet found analytical differences between the two types of illness deaths and are unsure if the distinction will be found useful, given the non-technical definition of “prolonged”.

In Rwanda, research attempted to try more reliably to identify adult deaths that were caused by AIDS. Based on previous work in Tanzania (Ainsworth and Semali 1998), a more detailed verbal autopsy method was tested but found to be inconclusive. In the Rwanda survey, for each person who was chronically ill or had died due to illness (as identified by the household), the respondent was asked about whether the person had any of the four symptoms: fever, chronic diarrhea, skin rash, or weight loss. The Ainsworth and Semali (1998) research suggested that having three or more of these symptoms indicated a high likelihood that AIDS was involved. In Rwanda, many of the chronically ill as well as those who died of illness had two out of the four symptoms, but few had three or more, so the results were inconclusive.

However, recent documentation by Doctor and Weinreb (2003) seems to indicate that with further refinement, the verbal autopsy method might be quite valuable particularly in the cases of adult death. They suggest dividing the symptoms into primary and secondary to get a more accurate measure on the probability of HIV/AIDS being involved. Given the lack of medical testing in rural areas and the need to know how HIV/AIDS may be affecting rural communities, it is worth investing in this methodology and does not require skilled medical enumerators to implement it. It does require careful phrasing of the questions and access to people in the household who were around when the person was ill. It would be very useful if surveys that include actual HIV testing would also include a part of the verbal autopsy method so that it can be evaluated.

5 EFFECTS AND STRATEGIES : SUBJECTIVE EVALUATION OF HOUSEHOLDS

In both Rwanda and Mozambique, households were asked a series of open-ended questions concerning the agricultural and livestock related strategies that the household adopted to deal with the stress of illness or death. In Rwanda, additional questions were asked about the effects of illness or death on the household. These open-ended questions yield rich information, but have some difficulties. One basic problem is in household with multiple stresses that might affect their options and choices, an difficult aspect to address, but critical if working in drought/flood or other disaster areas.

5.1 Questions on the effects of adult death or illness

In Rwanda, households were asked about the effects of death (or illness) on different aspects of their activities. This was found to be valuable in gaining perspective from the households, although it would have been more valuable to attempt to separate the effects felt during the period of illness and those after a death. Since households were asked this concerning each deceased adult and each adult currently ill, the answers can be compared, but may not be as accurate a reflection of differences as specific questions to households with a death. The specificity on household aspects (effects on children, effects on off-farm income, etc.) is valuable here, for it started to get at the variety of dynamics that occur within households, depending on the household composition and other factors. However, these open-ended questions for only one single effect per factor have disadvantages. There may be effects that are common among households, yet not classified as “the main effect” for all households and so the prevalence of the effect is not truly known. If there are particular expected effects that the researcher needs to evaluate, a better format might be a simple yes/no for those effects. For example “Did the household lose access to agricultural land after the death? Yes/no”.

5.2 Strategy questions

In Rwanda and Mozambique, for each person who left (regardless of reason) and each person who has been ill, the respondents were asked to specify the strategies pursued by the household in response to the effects of this person’s departure (or illness) on agricultural and livestock activities. The question was open-ended, and each household could specify up to three strategies per person departed or ill. Strategy responses that were pre-coded included (not exclusively): shifts in land use (cultivating less land, renting out or selling land), obtaining more labor (labor hiring, labor sharing, bring back household members, take children out of school, etc.), changing crops, and selling assets (livestock, other assets).

As with the effects questions above, the open-ended nature of the questions limits the interpretation of any specific strategy mentioned, although having up to three strategies indicated helps with interpretation. In both Mozambique and Rwanda, the strategy questions were focused on agricultural and livestock activities, the main reason for the research. Nevertheless, answers received were sometimes “effects” rather than strategies and were also more related to other aspects, such as care of children or diet, not strictly related to agriculture. In a related issue, many people may have been forced to pull children out of school, but not consider it to be related to their agricultural and livestock activities and so they do not mention it. Instead they may have said “Children work more in fields.” The ambiguity in the answers thus means that care must be

taken in interpreting frequencies for the responses.

Thus, the design of these questions is intimately related to the researchers' objectives. While there is clearly value in asking open-ended questions on effects and strategies, the addition of more direct questions is strongly recommended. If the researcher wants to know whether specific strategies were used or not by affected households, the best way to ask it may be a simple "yes/no" question, such as "Did the household switch to growing new crops that are less labor intensive?" Another alternative would be to ask household to list the 5 major crops grown now and those that were grown 5 years ago or a similar question.³

Some households indicated that there were no agricultural or livestock strategies adopted when a person died in the household. In Mozambique this response tended to be associated with non-head of household or female members who died. In Rwanda it was closely related to how long a person was ill before death and whether or not the primary activity of the person who died was in agriculture. People who had been ill along time prior to death (greater than 12 months) or did not have primary activity in agriculture were more likely to have "no strategy" as the response.

5.3 Time element

There is lack of clarity in these surveys about the effects during a long period of illness as opposed to the effects after death. Most of the current literature simply attempts to look at a household after a death and evaluate the impacts, with analysis of different periods after a death, to see if the effects are gradually eroding and the household returning to pre-death levels of income and production. Research is only beginning to distinguish between the effects and strategies of households during the long period of adult illness and the effects and strategies after a death.

The questions designed on effects and strategies after a death may suggest few adjustments if the person was ill for a long period prior to death. The household may have anticipated the death in different ways. HIV/AIDS as a shock to the household is unique in that all households are

³ A caveat to this approach is that investigating changes in cropping patterns over time just among a sub-sample (affected households) does not enable the analyst to control for cropping trends among the general population over the same time period. For example, while affected households may report growing more cassava in the current (post-death) time period than previously (pre-death), it is possible that part of this effect (increased cultivation of cassava) is a general trend in the population, due to changes in market, climatic, or other factors (and not specifically caused by adult mortality).

stressed over a long period as the person becomes more gravely ill and incapacitated prior to death. By the time a death occurs, many of the effects may already have been felt (as with the strategies adopted) such that the death itself is not the defining moment of effect. The same cannot be said of unanticipated deaths such as an accident, a murder, or an abrupt illness death as with meningitis. In Rwanda and Mozambique, we can use the strategies discussed by households with a currently ill adult as a proxy for possible strategies undertaken by households prior to the death of an adult, but only if ill adults seem to reflect a similar population to those who have died.

For the design of interventions, knowing when households are likely to take irreversible steps can contribute to developing mechanisms to avoid the need for those steps. That may mean that home based care programs are needed so that agricultural activities can be continued or it may mean new agricultural technologies for any period.

6 CONCLUSIONS

Nationally representative rural household surveys with statistically sound sampling methods can help provide complementary information on the presence of adult deaths and HIV/AIDS in rural communities. These quantitative surveys, combined with other more qualitative research methodologies, are one of the only ways to quickly let policy makers know how households are affected and what the households themselves do to respond to the stress. This in turn will help the design of appropriate interventions. This brief paper is designed to complement the instruments used in recent Mozambique and Rwanda agricultural surveys in providing a base for the development of future surveys. Designing the right survey instrument is not always simple, so learning from the experience of others contributes to the quality of the information and therefore the analysts' ability to respond to the needs.

As noted, these large sample structured-interview surveys are not the only way to obtain information, nor do they alone provide all the information needed for the assessment of the problems and design of interventions. However, given the existence of such surveys being fielded for living standards measurement and for agricultural sector analysis, the marginal cost of including the extra demographic information is relatively small and provides valuable information not available in HIV prevalence studies. The key is designing the surveys in a way to get that information accurately.

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ANNEX: Mozambique

The Trabalho de Inquerito Agrícola (TIA) (Agricultural Survey Work) 2002 is the second rural household survey that was conducted in Mozambique through the Ministry of Agriculture in order to understand the dynamics of rural production, income and activities. The first was in 1996. In 2002, a revised TIA was conducted, including a section on death, illness, and demographic patterns in the household. The 2002 households are not the same as the households visited in 1996, so there is no panel here. Instead, recall was used to capture information over time. In addition to the household surveys, there was a community level surveys, with interviews of key community leaders, providing information on schools, health centers, transport, and other aspects.

The following pages are English translations of the Trabalho de Inquerito Agrícola (Agricultural Survey Effort) 2002. There were more pages to the instrument, to collect agricultural production, sales, off-farm income, and other sources. The full Portuguese versions of the Household and Community level questionnaires can be obtained at the following website: <http://www.aec.msu.edu/agecon/fs2/mozambique/survey/index.htm>

B. HOUSEHOLD MEMBERS

- We would like to ask some questions about each of the household members (HH). List the names of all people considered as being members of the household since the beginning of 2001/2002 agricultural season.

No.	Name	Sex 1 Male Female	Relation to head 1 Himself/ Herself 2 Partner 3 Son 4 Brother/ Sister 5 Father/ Mother 6 Other parents 7 Without relation	Age (years completed)	Does this person live in this house since the beginning of 2001/2002 agricultural season? 1- Yes 2- No	Academic level 0 Illiterate 01 to 12 grade 13 Bachelor degree and above 19 know how to read and write	Marital Status 1 Single 2 Married 3 Marital union 4 Polygamous 5 Divorced or Separated 6 Widow/ widower	Do you grow crops and/or breed animals as the primary or secondary activity or none? 1 Primary 2 Secondary 3 None	In the last 2001/2002 season,	
									does this person undertake any paid work (cash or kind) outside the exploration?*	does this person undertake any business or other non farm activity? +
Only for members aged 10 years and above										
MEM	NAME	B01	B02	B03	B04	B05	B06	B07	B08	B09
1										
2										
3										
4										
5										
6										
7										
8										

** If besides the interviewed person, there are other people that undertake paid work, this must be reflected on Section T. + If there are other people undertaking own business activities, request their presence immediately and interview them about Sections U or V before they go out. Additional Members go to next page (1- Yes 2- No)*

Z. THE AVAILABILITY OF FAMILY LABOUR: CHANGES THAT OCCURRED IN THE LAST 3 YEARS.

- We want to know about the availability of family labour in the last 3 years because your household capability to produce depends on the number of people available. First we are going to talk about labour reduction, then labour increase and, finally we'll talk about illness that may reduce the capability to work in agricultural activities.

A. LABOUR AVAILABILITY REDUCTION.

Z01	Since January 1999, Is there a household member who had left and is no longer member of this household for any reason, including those who died?	1= Yes, <i>Fill the table</i> 2= No, <i>go to Z11</i>	
-----	--	--	--

Line	Name	Why is he/she no longer a household member?	<i>In case of departure:</i> When has the member left the HH? <i>In case of death:</i> When was that? YEAR 2002 2001 2000 1999	Age of person age (at the time (s)he left or died)	Sex	<i>If died:</i> What was the general cause of his/her death? 1- Accident 2- Giving birth 3- Prolonged illness (at least 3 months) 4- non prolonged illness 5- Other, specify	<i>If the person who left or died was more than 15 years old:</i> Identify 3 most important strategies undertaken by your household in order to minimize the effects of the departure/death on crop production and livestock activities. <i>See the codes on the previous page: if there's only one strategy, fill the other columns with 88</i>		
Z02	Nome	Z03	Z04	Z05	Z06	Z07	Z08	Z09	Z10
1									
2									
3									
4									
5									

STRATEGY CODES 01. Cultivated less land 02. Hired more labour 03. Increased the use of labour with other household members 04. Increased mutual help practice with other families 05. Obtained more labour through the return of an adult that was working outside the HH 06. Lent land to others 07. Rented or sold land to others 08. Reduced the time allocated to weeding 09. Adopted/increased Crops requiring less labor to cultivate	10. Utilized children more in income activities 11. Removed one or more children from school 12. Sent the children to live with their parents 13. Asked for a loan or donation 14. Adopted or accepted children from other HH 15. Was forced to spend most of household savings 16. Was forced to sell animals like cattle, goats, pigs 17. Was forced to sell other assets 18. Significantly reduce quality of the diet (consumed less meat, fish and vegetables) 19. Other, specify
---	--

B. LABOUR AVAILABILITY INCREASE

PART B

Z11	Is there someone who is now living with this household who arrived since January 1999, excluding the household members' babies born since 1999?	1= Yes, <i>Fill the table</i> 2= No, <i>go to Z14</i>	
------------	---	--	--

Line	Name <i>(See Section B)</i>	No. of household member (see Section B)	Why have you joined the household ?
	Name	Z12	Z13
1			
2			
3			

C. HOUSEHOLD MEMBERS WITH PROLONGED ILLNESS. (Prolonged illness means that a person cannot work during at least 3 of the last 12 months).

Z14	Is there someone among the household members that is suffering from a severe illness at present or usually suffers from a serious illness during at least 3 of the last 12 months?	1= Yes, <i>Fill the table</i> 2= No, <i>End</i>
-----	--	--

List the name(s) of person(s) and their number of order in the following table and ask about who takes care of the ill person(s).

Line	Name of the ill person <i>(See Section B)</i>	No. of the household member (see Section B)	How many months in a year was this person ill and couldn't work? # months in the last 12 months	Who is the main person responsible for taking care of this person? (See the HH members codes from section B)					Identify 3 most important strategies undertaken by your household in order to minimize the effects of the ill person on crop production and livestock activities.		
				The name of the person that takes care of the ill person	MEM Code from Section B 00- No one, go to Z20 50- Outside the HH	Sex 1- Male 2-Female	Relation to the ill person 1- Wife/husband 2- Son/daughter 3- Father/Mother 4- Grand(father/mother)	5- Brother/sister 6- Daughter in law/ Brother in law 7- Other relative 8- not related 9- (her)himself	<i>See the codes on the previous page: if there's only one strategy, fill the other columns with 88</i>		
	Nome	Z15	Z16		Z17	Z18	Z19	Z20	Z21	Z22	
1											
2											
3											

ANNEX: Rwanda

The research in Rwanda is slightly different than that in Mozambique. While the survey was the result of a single visit to households in Mozambique, enumerators in Rwanda visited the same household over a period of about 3 years for agricultural production and land and input use. The first agricultural season covered was Season A of 2000 (covering planting in late 1999; harvest in early 2000). Then, for each of the two main agricultural seasons the household was visited, through Season B of 2002. In early 2001, a demographics component was administered to the households, as indicated in the first table. In February 2002, the households were re-visited for the demographic component with sections added on illness and death (Tables 1.1 through 1.7).

Thus overall, there is a brief time series on agricultural production and land use, two visits for the demographics, and recall on deaths and other departures and arrivals.

1.1. New Members: Additions to the household since February 2001 (time of the visit to this household when information was collected on hh demographics)

In February of 2001 you told us that your household had _____ members. Show the respondent the photocopied demographic form, and read the names off. Having these people in mind, we would like for you to tell us how many new arrivals there were in your hh since we filled out this form. Write now the number _____. Then ask the respondent to answer each of the questions in the table below about **each** and **all** new arrivals to your household since last February.

Key variables: Pref, Commune, Secteur, Cellule, Menage, NMEM

Reference Period: Since visit in February, 2001

ID	Name of new arrival to the household, or returning non-resident member of the hh.	Has this person ever lived in the hh before, or is he/she a new arrival? 1=return 2=new arrival	Why is this person now joining this household? 15=to look for land 16=studies 17=came with mother or incoming child of head-spouse 18=back from grandparent's house 19=back in hh from job 20=back from prison 21=back in family/hh 22=orphan 23=house destroyed 24=returning wife 25=to flee local patrol 1=birth 2=marriage-cohabitation 3=own illness convalescence 4=someone else's illness 5=death this hh 6=death another hh 7=other reason-not specified 8=job-to look for job 9=came to live with relative 10=came to live-not related 11=to help in hh 12=refugee who returned 13=to visit 14=returned due to problem with husband	How old is this person? In years	Age Group 1=0-4 2=5-14 3=15-60 4=>60	Sex of new mem? 1=male 2=fem	Relationship to head of hh See codes below: 1=Head 2=Spouse 3=Children of head or spouse 4=Unrelated children 5=Orphans from extended family 6=Parents, parents-in-law, grandparents 7=Grandchildren of head 8=Brother / sister 9=Other relatives (nephew, uncle, cousin) 10=Unrelated adult	Marital Status 1=single 2=monogamously married 3=free union - illegal marriage 4=divorced 5=separated 6=widowed 7=other 8=polygamously married	How many months in the past 12 months has this person been in the hh? 0-12 months	Does this person know how to read and write? 1= yes 2=no	Education - Highest level completed? 1=never 2=primary/ incomplete 3=primary/ complete 4=post-primary 5=secondary/ incomplete 6=secondary/complete 7=university	3 most important work activities-labor use- of this member? See codes below: if specialized to 1 activity, enter 88 in 2nd and 3rd columns 1=Agriculture/livestock 2 =Paid agricultural worker 3=Unskilled worker 4=Independent artisan 5=Paid artisan 6=Commerce 7=Skilled worker 8=domestic assistant-unpaid 9=Student 10=Domestic help-housekeeper 11=caring for ill hh member 12=mine worker 13 =fishing 14=other 88=specialized to one activity 99=no activity		
												1st	2nd	3rd
NMEM	Name	NM01	NM02	NM03	AgeGrp	NM04	NM05	NM06	NM07	NM08	NM09	NM10	NM11	NM12
1														
2														
3														
4														
5														
6														

1.4 Left Due to Marriage:

Follow up information on household behavior if one or more adult household members (age 15 or older) identified in the prior table was lost permanently due to marriage. List the person(s), name(s) and LMEM number(s) in the table below, and ask a series of questions about the effects on the household of the departure of each person.

Key variables: Pref, Commune, Secteur, Cellule, Menage, MAMEM

Reference Period: From prior table-past 4 years, adult leaving hh due to marriage.

ID	Prior ID ID From Lost Member Table (Put LMEM # here)	Name of person who got married and left: Write down from prior table	Was this person playing an active role in completing hh's work activities during the 12 months preceding marriage? 1=yes ->MA04 2=no ->MA03	For how long was this person inactive in completing hh ag and other duties? # months e.g. 1-48	Identify the 3 most important work activities-labor use- of this member who left. See codes below: if specialized to 1 activity, enter 88 in 2 nd and 3 rd columns			Did this person's departure affect your farming and livestock activities? 1=yes- ->MA08 2=no- ->next person	Tell us the major effects, if any, of each person's marriage on your household according to the following categories of activities: See codes below:					Identify the 3 most important strategies your hh has used to cope with the effects on your hh agricultural & livestock activities of this marriage. See codes below: if only 1 strategy, enter 88 in 2 nd and 3 rd columns			Any other effects or strategies that the respondent wants to identify? List below, linking to the specific person who left due to marriage.
					1st	2nd	3rd		Ag-cropping/livestock	Other income generation	Savings/debt	On your diet	On your	1st	2nd	3rd	
MAMEM	MA01	Name	MA02	MA03	MA04	MA05	MA06	MA07	MA08	MA09	MA10	MA11	MA12	MA13	MA14	MA15	MA16
1																	
2																	
3																	
4																	
5																	

Notes for MA16 Responses

1.5 Left Due To Migration off the farm to find work or left for other general reasons:

Follow up information on household behavior if one or more adult household member(s) (age 15 or older) identified in the LOST MEMBER table were lost permanently due to migration off the farm to get work or for other general reasons not included in other categories. List the person(s), name(s) and LMEM number(s) in the table below, and ask a series of questions about the effects on the household of the departure of each person.

Key variables: Pref, Commune, Secteur, Cellule, Menage, MIMEM Reference Period: From prior table-past 4 years, adult leaving hh due to migration/other reasons.

ID	Prior ID ID From Lost Member Table (Put LMEM # here)	Name Write down from prior table	Was this person playing an active role in completing hh's work activities during the 12 months preceding migration or leaving? 1=yes ->MI04 2=no ->MI03	For how long was this person inactive in completing hh ag and other duties before leaving? # months e.g. 1-48	Identify the 3 most important work activities-labor use- of this member who left. See codes below: if specialized to 1 activity, enter 88 in 2 nd and 3 rd columns			Did this person's departure affect your farming and livestock activities? 1 = yes ->MI08 2 = no ->next person	Tell us the major effects, if any, of each person's migration off the farm on your household according to the following categories of activities: See codes below:					Identify the 3 most important strategies your hh has used to cope with the effects on your hh agricultural & livestock activities of this departure. See codes below: if only 1 strategy, enter 88 in 2 nd and 3 rd columns			Any other effects or strategies that the respondent wants to identify? List these below, linking to the specific person who left due to migration out of the household.
					1st	2nd	3rd		Ag-cropping/livestock	Other income generation	Savings/debt	On your diet	On your	1st	2nd	3rd	
MIMEM	MI01	Name	MI02	MI03	MI04	MI05	MI06	MI07	MI08	MI09	MI10	MI11	MI12	MI13	MI14	MI15	MI16
1																	
2																	
3																	
4																	
5																	

Notes for MI16 Responses

1.6 Left Due To Death:

Follow up information on household behavior if one or more adult household members (age 15 or older) identified in Table 1.3 was lost permanently due to death. List the person(s), name(s) and LMEM number(s) in this table, and ask a series of questions about the effects on the hh of the death of each person.

Key variables: Pref, Commune, Secteur, Cellule, Menage, PILL

Reference Period: From prior table-past 4 years, adult leaving hh due to death.

ID	Prior ID ID from Lost Member Table (Put LMEM # here)	Name of the person(s) who died? Write down from prior table	What was the general cause of this person's death? 1=Accident 2=Childbirth 3=Murder 4=Disease or sickness (if 4 --> D03- D06) then all others	If died of disease or sickness, did the person experience any of the following: 1=yes 2=no				Was this person playing an active role in completing hh's work activities during the 12 months preceding death? 1=yes -> D9-11 2=no -->D8	For how long had this person been inactive in completing hh ag and other duties? # months e.g. 1-48 Go to D12	For each person who died, identify the 3 most important work activities(labor use) of this deceased member in the 12 months preceding death. See codes below: if specialized to 1 activity, enter 88 in 2 nd and 3 rd columns			Tell us the major effects, if any, of each person's death on your household according to the following categories of activities: See codes below:					Identify the 3 most important strategies your hh has used to cope with the effects on your hh agricultural & livestock activities of this death. See codes below: if only 1 strategy, enter 88 in 2 nd and 3 rd columns				Any other effects or strategies that the respondent wants to identify? List these below, linking the points back to the specific person who died.	
				1st	2nd	3rd	Ag-cropping/livestock			2 nd Ag-cropping/livestock	Other income generation	Savings/debt	On your diet	On your	1st	2nd	3rd	4rd					
PILL	D01	Name	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	D12a	D13	D14	D15	D16	D17	D18	D19	D19 A	D20
1																							
2																							
3																							
4																							
5																							

Notes for D20 Responses

1.7 Left Due to Illness:

Follow up information on household behavior if one or more adult (age 15 or older) household members identified in Table 1.3 left the household due to prolonged illness. List the person(s), name(s) and LMEM number(s) in the table below, and ask a series of questions about the effects on the household of illness of each person.

Key variables: Pref, Commune, Secteur, Cellule, Menage, LILL

Reference Period: From prior table-past 4 years, adult leaving hh due to illness.

ID	ID from Left Member Table (Put LMEM # here)	Name Write down from prior table	Will this person return to the household within the next 6 months? 1=yes 2= no	Was this person playing an active role in completing hh's work activities during the 12 months preceding departure? 1=yes 2= no ->LILL08	Before he leaves "..." for how many months was he sick/unable to do agricultural jobs or other jobs for the household? # months e.g. 1-12	For each person who left due to illness, identify the 3 most important work activities (labor use) of this member in the 12 months preceding departure? See codes below: if specialized to 1 activity, enter 88 in 2 nd and 3 rd columns			Tell us the major effects, if any, of each person's illness on your household according to the following categories of activities: See codes below:					Identify the 3 most important strategies your hh has used to cope with the effects on your hh agricultural & livestock activities of this departure. See codes below: if only 1 strategy, enter 88 in 2 nd and 3 rd columns			Any other effects or strategies that the respondent wants to identify? List these below, linking the points back to the specific person who departed due to illness.
						1st	2nd	3rd	Ag-cropping/livestock	Other income generation	Savings/debt	On your diet	On your	1 st	2nd	3rd	
LILL	LILL01	Name	LILL02	LILL03	LILL04	LILL05	LILL06	LILL07	LILL08	LILL09	LILL10	LILL11	LILL12	LILL13	LILL14	LILL15	LILL16
1																	
2																	
3																	
4																	
5																	

Notes for LILL16 Responses

Person:	Person:

Common Codes For Worker Activity, Effects on Households and Strategy To Cope Questions in Tables 1.2, 1.4, 1.5, 1.6, and 1.7.

Work Activity Codes	Codes for Effects On Household By Categories of Activity	Codes For Strategies to Cope With Effects on Your Farming and Livestock (and household) Operation
1=Agriculture / livestock	(1) If any, effects on hh agriculture-cropping/livestock	1=Get new hh member/encourage return of non-resident hh member
2 =Paid agric worker	(10) No effects	2=Hire ag & livestock labor
3=Unskilled worker	(11) Reduced farm labor	3=Seek sharing of labor from other hh's
4=Indep. artisan	(12) Lost access to land	4=Reduce schooling for children
5=Salaried artisan	(13) Reduced knowledge/skills for farming	5=Cultivate less land/leave land fallow
6=Commerce	(14) Effect not specified (15) Reduced farm income	6=Rent out some land
7=Skilled worker	(16) Production decreased (17) Reduced crop varieties	7=Loan land to relatives
8=Domestic assistant/ unpaid	(18) No money to pay workers (19) Delayed seeding time	8= Ask relatives for loan or income
9=Student	(2) If any, effects on hh other income generating activities	9=Change crop mix to raise income (specify on bottom of page. from: to:)
10=Domestic help / housekeeper	(20) No effects	10=Teach young children ag. practices
11=Care for ill	(21) Reduced non-farm enterprise income	11=Weed crops less
12=Mine worker	(22) Reduced labor income	12=Less leisure/work more hours in fields
13=Fishing	(23) Reduced remittances from family members	13=Eat fewer meals
14=Other	(24) Reduced income	14=Send children to live with relatives
88=Specialized to one activity	(25) Other	15=Change crop mix to less labor intensive crops. Specify. From: To:
99=No activity	(3) If any, effects on your hh savings/debts	16=Sell livestock
	(30) No effects	17=Sell land
	(31) Used up hh savings	18=Sell hh assets other than land
	(32) Increased hh debt	19=Other, e.g. get a job, gather hay for animals rather than grazing with herder, ag work time decreased
	(33) Effect not specified	
	(4) If any, effects on your hh's diet	20=Get credit
	(40) No effects	21=Work for food
	(41) Change diet composition for the worse	22=Go into commerce
	(42) Change diet composition for the better	23=Hire out ag skills
	(43) Eat fewer meals	24=Sell crops
	(44) Eat more meals	25=Get help/join health association
	(45) Other	26=cultivate fewer crops
	(5) If any, effects on hh children	27=get a job
	(50) No effects	28=begging at market
	(51) Reduced formal schooling of children	29=not remarry so have more time for children
	(52) Reduced time for adults to care for children	88=No 2 nd or 3 rd or 4 th strategy
	(53) Losing agriculture/farming skill via mentors	99=No strategy
	(54) Speeding up transfer of ag skills to children	
	(55) Sent to live with relatives	
	(56) Reduced income to spend on children	