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OUT-MIGRATION IN THE CONTEXT OF THE HIV/AIDS EPIDEMIC: EVIDENCE FROM THE FREE STATE PROVINCE

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CSSR Working Paper No. 57

Published by the Centre for Social Science Research
University of Cape Town
2003

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Price in Southern Africa (incl. VAT and postage): R 15.00

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ISBN 0-7992-2229-1

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December 2003

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This research project is sponsored jointly by USAID, DFID and AUSAID and administered by the Joint Center for Political and Economic Studies under subcontract JCNAT674-97-P006-02 from Nathan Associates

Out-migration in the context of the HIV/AIDS epidemic: Evidence from the Free State province

Abstract

This paper investigates the characteristics and determinants of out-migration in the context of the HIV/AIDS epidemic, using data from a panel designed to investigate the household impact of the epidemic. Departure models show that individual attributes, notably age and gender, play an important role in explaining out-migration from households that have not experienced morbidity or mortality. In affected households, a number of household-level variables, notably the gender of the household head, place of residence, family structure, the dependency ratio, human capital and household size, feature as important determinants of out-migration. Health shocks in the form of increased mortality, which characterises the impact of the epidemic, independently explain part of observed differences in out-migration from affected households, the out-migration of ill persons from affected households, and the out-migration of orphaned children from affected households. Thus, migration represents an important strategy for poorer households having to cope with the HIV/AIDS epidemic, both as an economic survival strategy and as a social strategy aimed at accessing support from the extended family.

1. Introduction

South Africa faces one of the highest HIV prevalence rates in the world. The estimated adult prevalence of HIV amongst 15-49 year olds in 2001 was 20.1 percent (UNAIDS, 2002), while the ASSA2000 model put adult prevalence amongst 20-65 year olds at 24.1 percent (ASSA, 2003). A recent national household survey in turn has put the 2002 estimate of adult prevalence amongst those older than 25 years at 15.5 percent (HSRC, 2002).

The role of migration in the HIV/AIDS epidemic has been explored in a number of studies. The predominant interest, though, has been with the spatial

distribution of HIV prevalence rates and AIDS cases (Ellis, 1996) and the manner in which migration is contributing to the spread of the virus (Decosas *et al*., 1995; UNAIDS & IOM, 1998; Lurie, 2000; Soskolne & Shtarkshall, 2002).[1] Questions about how HIV/AIDS may affect patterns of migration have received little attention. Verghese *et al*. (1989), for example, argued that the urban to rural migration of HIV/AIDS patients is unknown and underestimated. This is also true in the case of the post-diagnosis migration of HIV-infected persons in South Africa and other developing countries in Southern Africa. Knowledge of such migration and of the impact of the HIV/AIDS epidemic on migration patterns is crucial for informing planning with regard to the funding and delivery of health care and social services aimed at mitigating the impacts of the epidemic.

This paper investigates certain aspects of out-migration in the context of the HIV/AIDS epidemic with the aid of data from a panel designed to investigate the household impact of the epidemic. Section 2 presents an overview of migration in the context of the HIV/AIDS epidemic. Section 3 describes the data and method, while section 4 elaborates on the departure model employed to assess the determinants of out-migration. Section 5 reports on the empirical evidence on the link between HIV/AIDS and out-migration. Section 5.1 reports on differences in the characteristics and determinants of out-migration in affected households and household not affected by morbidity and mortality. Sections 5.2 and 5.3 focus on the characteristics and determinants of out-migration of ill persons and orphaned children respectively from affected households. Finally, section 6 discusses the results and concludes.

2. Migration in the context of the HIV/AIDS epidemic: an overview

Early migration theory put the individual at the centre of the migration decision. These microeconomic models of migration argue that individuals would migrate when the perceived benefits of migrating exceed the associated costs (Greenwood, 1985; Findlay, 1987; Junming, 1997; Posel, 1999; Kok *et al*.,

[1] According to Lurie (2000), the role of migration in the diffusion of the HIV/AIDS epidemic remains unclear, given the focus on 'receiving' areas only in most migration studies, thus precluding the study of migrants and their families concurrently in both the 'receiving' and 'sending' areas.

2003), for example, when the migrant anticipates a higher future return on investments in education and training (Lauby & Stark, 1988). Alternatively, Stark (1984) has endeavoured to explain individual migration using a relative deprivation approach, with migratory movements acting to improve the migrant's position relative to some perceived deprivation.[2] Increasingly, however, there has been a realisation that household-level factors are equally important in explaining the determinants of migration (Root & De Jong, 1991). The basis for this development was the idea that migration in developing countries is undertaken as a family or household strategy rather than an individual decision and that social factors also play an important part in explaining migration patterns (Greenwood, 1985; Findlay, 1987; Lauby & Stark, 1988; Massey, 1990; Junming, 1997; Kok *et al*., 2003). Thus, the household is conceived as a unit in which migration decisions have as their goal the maximisation of household rather than individual income (Findlay, 1987; Posel, 1999). This theory is particularly relevant in the context of the HIV/AIDS epidemic, given that the epidemic exposes households to numerous shocks or crises. For example, as adult members of the household become ill and are forced to give up their jobs, household income will fall. To cope with the changes in income resulting from these shocks and the need to spend more on health care, children are often taken from school to assist in caring for the sick or to work so as to contribute to household income. Because expenditure on food comes under pressures, malnutrition often results, while access to other basic needs such as health care, housing and sanitation may also come under threat. This acts to further reduce the resistance of infected adults and children to opportunistic infections, given lower levels of immunity and knowledge, which in the longer term will result in further mortality shocks (World Bank, 1998; Gaffeo, 2003). Therefore, HIV/AIDS and the associated burden of morbidity and mortality expose households to further shocks (Desmond, 2001; Poku, 2001; Whiteside, 2002). Thus, migration represents a strategy to help the household survive so as to cope with the impacts of the epidemic. Examples of such strategies include employment migration, the inter-household reallocation of labour, and migration that access support from the extended family (Findlay, 1987; Young & Ansell, 2003a).

[2] Junming (1997) contrasts these microeconomic models of migration with the macroeconomic model of migration. The macroeconomic model represents migration as a factor that ensures spatial equilibrium in market economies, with flows of people attributed to geographical disparities in employment opportunities, income levels, and the availability of amenities (Brown & Goetz, 1987; Junming, 1997; Kok *et al*., 2003).

Apart from the role of HIV/AIDS in affecting migration patterns, knowledge about the nature of the post-diagnosis migration of HIV-infected persons and AIDS patients is also important. This is the case for four reasons. *Firstly*, an understanding of migration is more crucial in the context of HIV/AIDS than is the case with other diseases, given that the population at risk of infection is relatively young (HIV-prevalence rates in South Africa, for example, peak between the ages of 15 and 29 years) and highly mobile (these young adults normally migrate during this time for reasons related to education, employment and marriage). *Secondly*, migration of infected persons will determine where additional health care services will be needed to care for these persons once they become ill, which holds further implications for the manner in which HIV/AIDS funds are allocated to departments responsible for providing health care and welfare services targeted at HIV/AIDS patients. *Thirdly*, HIV-infected persons that migrate may contribute to the spread of the epidemic in recipient areas, which is the aspect of migration addressed in the majority of the literature on this topic. In fact, Rumley *et al*. (1991) report that although initially the patient population migrated from urban areas, they are now largely being replaced by locally infected or so-called 'home-grown' patients. *Lastly*, this influx of HIV-infected persons in certain areas may necessitate improving and extending prevention and awareness programmes as well as general education about HIV/AIDS. This would not only curb the spread of the HIV/AIDS epidemic in these areas, but also educate these communities about the nature of the epidemic and the ways in which communities can support those infected and affected by HIV/AIDS (Davis & Stapleton, 1991; Rumley *et al*., 1991; Cohn & Klein, 1994; Buehler *et al*., 1995; Ellis, 1996; Ellis & Muschkin, 1996).

Most of the evidence on post-diagnosis migration of HIV/AIDS patients comes from studies conducted in the United States (Davis & Stapleton, 1991; Cohn & Klein, 1994; Ellis, 1996). There is evidence that HIV-infected persons move to urban areas and in particular larger metropolitan centres in order to access health care services (Buehler *et al*., 1995; Ellis, 1996; Wood *et al*., 2000). However, the available evidence also indicates that the opposite has occurred, i.e. infected persons have migrated to rural areas to access health care services and social support in rural rather than in urban settings (Davis & Stapleton, 1991). Ellis (1996: 1002) describes these differences in migration patterns in terms of a 'stage model of mobility for people infected with HIV/AIDS'. He argues that persons who are unaware of their status will migrate as in general do people of the same age, gender, population group and educational status. Once aware of their infected status and once having experienced the associated symptoms of HIV/AIDS-related illness, these individuals are likely to migrate from rural

areas to urban centres where health care services are more readily available. In the final stages of the disease, these persons may migrate back to those rural areas where they originate, in order to access the care and support of their families in the final months of their lives (Ellis, 1996; Ellis & Muschkin, 1996).[3]

There is anecdotal and empirical evidence of migration of infected persons (many of whom reportedly were infected and diagnosed in urban and larger metropolitan areas) to those rural areas or towns where they grew up or where their immediate family resides, particularly for reasons related to social support and health care (Verghese *et al*., 1989; Davis & Stapleton, 1991; Cohn & Klein, 1994; Ellis, 1996; Ellis & Muschkin, 1996; Wood *et al*., 2000).[4] As such, social support from the family remains an integral part of caring for HIV/AIDS patients (Verghese *et al*., 1989). In North Carolina, for example, almost 90 percent of patients that had lived outside of the state indicated that they had migrated to North Carolina for better social support, while 65 percent moved to be near family. Almost three quarters of patients diagnosed outside of the state indicated that they had moved there for health reasons, i.e. for better or more personalised health care or for help caring for their HIV diseases (Cohn & Klein, 1994). Elsewhere, HIV/AIDS patients who had moved to Iowa or back to Iowa utilised a substantial share of HIV/AIDS-related health care services provided in an outpatient clinic located in a rural area (Davis & Stapleton, 1991). In Southern Africa, such urban to rural migration accompanying the HIV/AIDS epidemic is likely to be strengthened by existing systems of migrant labour, with HIV/AIDS-related chronic illness causing migrant workers in cities to return to their homes in rural areas (Girdler-Brown, 1998). Verghese *et al*. (1989) argued that we know little about the migration of HIV/AIDS patients. This is also true in the case of the post-diagnosis migration of HIV-infected persons in South

[3] There exists no general theory of migration. In fact, Arango (2000), in a recent review of different theories of migration, argues that migration is too diverse, too hard to define, too difficult to measure, and too multifaceted to be explained by a single theory. Moreover, not one of the theories discussed in this review makes any reference to the role of health or disease in explaining patterns of migration. However, this may be the result of the focus of the paper being on international migration.

[4] An exception, though, to the above evidence of urban to rural migration of HIV/AIDS patients are two studies conducted in Canada (Hogg *et al*., 1997) and the United States (Buehler *et al*., 1995). Both studies found that a relatively small proportion of infected persons actually changed residence between AIDS diagnosis and death. However, this may reflect the limited mobility of people in the stages between AIDS diagnosis and death, given that illness at this stage is quite severe and patients are often weak and unable to perform any daily tasks. Therefore, the latter evidence does not negate the above evidence that mobility is relatively high between HIV diagnosis and treatment or death.

Africa and other developing countries in Southern Africa. Knowledge of such migration is crucial for informing planning with regard to the funding and delivery of health care and social services aimed at mitigating the impacts of the epidemic.

According to Young and Ansell (2003a: 464), "children's migration has… been unsatisfactorily subsumed within family migration". Yet, children often migrate on their own and separately from other members of the household. In fact, these independent migrations of children would rise as the orphan crisis associated with the HIV/AIDS epidemic takes its toll. Based on qualitative evidence from a multi-country study, Young and Ansell (2003a) point out that children leave their households for four main reasons: to care for the ill, due to the death of one or both parents, due to the inability of the family to take care of them in light of increasing poverty, or as a result of the remarriage of widowed parents. The authors distinguish between five types of migratory movements of children associated with the HIV/AIDS epidemic. Firstly, children may be 'adopted' into the household as members of the family unit. Alternatively, migrating children may be received by families as workers rather than as fully-fledged members of the family. Some children will migrate to orphanages of families of street children. In addition, children affected by the epidemic may engage in multiple migratory moves, or may be separated from their siblings (Young & Ansell, 2003a; Ansell & Young, 2004). Young and Ansell (2003a) argue that issues pertaining to the migration of children in response to the HIV/AIDS epidemic are under-researched. It is the objective of this paper to contribute to the above corpus of knowledge related to the impact of HIV/AIDS on migration.

3. Data and method

The household impact of HIV/AIDS was assessed by means of a cohort study of households affected by the disease. The four waves of data collection were respectively completed in May/June and November/December of 2001 and in July/August and November/December of 2002. The survey was conducted in two local communities in the Free State province, one urban (Thabong township in Welkom) and one rural (the former Qwaqwa homeland), in which the HIV/AIDS epidemic is particularly rife. Both areas are relatively disadvantaged in terms of levels of development. According to the report entitled *Measuring Poverty in South Africa* published by Statistics SA early in 2000, the Welkom magisterial district had a headcount poverty ratio of 0.34 in 1996. The incidence

of poverty was a staggering 0.69 in the magisterial district of Witsieshoek, which is within the boundaries of the former Qwaqwa and represented one of the poorest in the country (Statistics South Africa, 2000). A descriptive analysis of these two areas based on data from the 1996 population showed levels of unemployment to be relatively high and levels of education to be relatively low (Van Rensburg & Redelinghuys, 2001.) Migration, therefore, is likely to play an important role in these two communities as a household survival strategy, given that people and households that reside in underdeveloped areas generally have a greater economic incentive for migration.

Comparisons are drawn between so-called affected households and households that have not experienced morbidity or mortality in any period. Affected households were sampled purposively via NGOs and other organisations involved in AIDS counselling and care and at baseline included at least one person known to be HIV-positive or known to have died from AIDS in the previous six months. Informed consent was obtained from the infected individual(s) or their caregivers (in the case of minors). The incidence of morbidity and mortality are considerably high in these affected households and exhibits a classic HIV/AIDS pattern, with large numbers of adults (i.e. those aged 15-49 years) having experienced illness or having died. Moreover, between 70 and 80 percent of morbidity and mortality in affected households can be attributed to HIV/AIDS or related infectious diseases and opportunistic infections (Bachmann and Booysen, 2003; Booysen *et al*., 2003). Households that have not experienced morbidity or mortality represent households living in close proximity to affected households. These households at baseline did not include persons suffering from tuberculosis or pneumonia or persons experiencing morbidity or mortality in any of the four waves of the panel. (These households are not called 'non-affected households', as is the common practice, given that they may include HIV+ persons.) The subsequent analyses, therefore, albeit based on data from a relatively small, purposive sample, present some indication of the socio-economic impact of HIV/AIDS on households. Yet, the classification of households employed in this analysis, although useful for the purposes of our analysis, belies the fact that HIV/AIDS affects entire communities and various households directly or indirectly at different stages of the epidemic, rather than select groups of households that directly experience morbidity and mortality (Freire, 2003).

Households were defined in terms of the standard definition employed by Statistics South Africa in the *October Household Survey* (OHS), i.e. "a person or a group of persons who live together at least four nights a week at the same

address, eat together and share resources". A survey on the quality of life and household economics was conducted. Interviews were conducted with one key respondent only, namely the "person responsible for the daily organisation of the household, including household finances". During follow-up interviews, fieldworkers were also able to determine who had left the household by checking the names of the current household members against the household roster for the previous interview. After determining who had left the household, interviewers asked a number of questions regarding the socio-demographic characteristics of these persons, the reasons why they had left, what their current whereabouts were and whether and how they had contributed to the household before leaving.[5] These data makes it possible to investigate the characteristics and determinants of out-migration in the context of the HIV/AIDS epidemic.[6] Bivariate analysis is used to compare out-migrants in affected households with out-migrants in households that have not experienced morbidity or mortality. *Chi2* tests are used to assess the statistical significance of these differences. The characteristics of ill persons and orphaned children that left affected households are described using univariate analysis. Furthermore, a pooled probit regression is employed to investigate the determinants of out-migration. These analyses were performed using *SPSS 10.1* and *Stata7* statistical software.

Standards of living were measured at the household rather than the individual level, given that the focus here is on the household impact of HIV/AIDS. Poverty is here interpreted in terms of the command over commodities that resources afford people via income and consumption (Lipton and Ravallion, 1995). The concern, therefore, is with 'poverty proper' (i.e. resource adequacy) and not with the physiological, sociological or political dimensions of poverty (Kgarimetsa, 1992; Woolard and Leibbrandt, 1999). (One should note that the complex nature of the association between poverty and HIV/AIDS also requires that capability, social exclusion and participatory approaches to poverty

[5] Caution, however, is required insofar as this survey did not track all households or migrating individuals, but due to cost constraints rather opted for tracking no one anywhere, apart that is from households that moved from one residence to another in the same study site. As such, the results presented in this paper do not present a complete picture of migration patterns in this cohort of households. Nevertheless, the data provide some useful insights into aspects of out-migration in the context of the HIV/AIDS epidemic.

[6] Similar data were collected since round 3 of the panel for persons that had joined the households in the study since the previous round of interviews. These data are not analysed here due to the fact that one does not have information about the characteristics of the households from which these persons originated. Given that the so-called departure models employed to investigate determinants of migration requires such information, out-migration rather than in-migration is the focus of this paper.

eradication be focused on this research topic, as argued by Stewart (2003), approaches that cannot be explored here due to the nature of the survey.) During the survey, data were collected from one informant of each household regarding the employment income, non-employment income (which includes social grants) and receipts of remittances for the members of the particular household. An estimate of total monthly household income was derived from these figures by adding up the various component items. Where appropriate, income estimates were converted into real values using the most recent CPI estimates (2000=100) published by Statistics South Africa (2003). These data on the characteristics of out-migrants and the receiving households are employed to investigate the characteristics and determinants of out-migration in the context of the HIV/AIDS epidemic.

The results reported in this paper are based on an analysis of data for out-migrants from the approximately 400 households interviewed during this study. Due to the sampling design and small sample size, however, the findings from this study cannot be generalised to households across South Africa, but pertain largely to the impact of HIV/AIDS on a group of poor, African households. Thus, the research is indicative only (but nevertheless telling) of the socio-economic impact of the HIV/AIDS epidemic, a characteristic shared by most other HIV/AIDS household impact studies (Booysen and Arntz, 2003).

4. Investigating the determinants of migration: departure models

This paper proposes to assess the characteristics and determinants of out-migration in the context of the HIV/AIDS epidemic. So-called departure models are used for this purpose. These models incorporate a variety of individual-, household- and community-level variables in comparing migrants to non-migrants using data collected at the area of origin, the aim being to elucidate the determinants of migration decisions in the process (Bilsborrow *et al*., 1987; Brown & Goetz, 1987; Bilsborrow & Zlotnick, 1992; Donato, 1993; Kok *et al*., 2003). Some models of migration, however, focus on the analysis of the determinants of family migration (i.e. the movement of entire families), rather than the interaction between individual- and household-level factors in explaining migration at an individual level (Root & De Jong, 1991). Furthermore, there has been much focus on the development of multi-level analysis of migration, i.e. analysis that integrates individual-, household- and

community-level data (in some cases, these include even national-level policy variables) to investigate patterns of development (Bilsborrow *et al.*, 1987; Massey, 1990; Junming, 1997; Kok *et al.*, 2003). This also signifies an integration of the micro- and macroeconomic models of migration. Junming (1997: 5) argues that, "it is impossible to predict the strength and direction of the relationship between the likelihood of migration and individual background variables in the absence of information on the social, economic, and historical conditions of places of origin and destination". Findlay (1987), for example, hypothesises that the probability of migration would decline as the level of socio-economic development in the community increases, an argument Brown and Goetz (1987) back up with empirical evidence. However, an application of such multi-level analysis, at least at the community level, is not feasible here, given that the necessary data are not available for magisterial district level. (Yet, in the future, we hope to access the 2001 census data for the districts in which this study has been conducted, which would make such analysis feasible.) This paper takes the empirical route common to many studies of migration, i.e. incorporating a variety of individual- and household-level variables in a model to investigate the determinants of migration.[7] This model can be written as:

$$M_{ij} = f(X_{ij}, X_{jk}),$$

where M_{ij} represents the probability of migration of individual *i* in household *j*. X_{ij} and X_{jk} represent vectors of those individual and household characteristics influencing the migration decision (Bilsborrow *et al.*, 1987). The dependent variable included in these departure models of out-migration was coded as a binary or dichotomous variable. Migration status took on a value of one if the person had left the particular household by the time the follow-up interview was conducted. Migration status took on a value of zero for those individuals who had not migrated from the household. Migration status was coded for five sub-samples of individuals:

- CMIGRANT: Migrants (n=185) and non-migrants (n=4087) from all affected households and households that have not experienced morbidity or mortality.
- AFFMIG: Migrants (n=144) and non-migrants (n=2725) from affected households.

[7] According to Massey (1990), however, this predominant focus on the determinants rather than the consequences of migration has meant that our understanding of migration has remained partial. Greenwood (1985) correspondingly highlighted the fact that most advances in migration studies in the 1980s pertained to our knowledge of the causes of migration.

- NAFFMIG: Migrants (n=41) and non-migrants (n=1362) from households that have not experienced morbidity or mortality.
- ILLMIG: Migrants (n=22) and non-migrants (n=694) from affected households that had been continuously ill in at least one period.
- ORPHMIG: Migrant children (n=13) and non-migrant children (n=363) in affected households aged fifteen years or under whose mother and/or father were reportedly not alive.

Given the relatively small numbers of out-migrants in each of the sub-samples, the data was pooled. The independent variables considered for inclusion in these departure models are those individual and household characteristics that were included in empirical studies on the determinants of migration and that were available from the dataset (Greenwood, 1985; Bilsborrow *et al*., 1987; Brown & Goetz, 1987; Findlay, 1987; Lauby & Stark, 1988; Root & De Jong, 1991; Anyanwu, 1992; Bilsborrow & Zlotnick, 1992; Brockerhoff & Eu, 1993; Donato, 1993; Fraser, 1993; Junming, 1997; Posel, 1999; Kok *et al*., 2003).

The *individual-level variables* included the following:

- Age; age squared; gender; highest level of education; marital status; self-employment status; economically active status (employed or unemployed but looking for work).

The *household level-variables* considered for inclusion in the departure models included:

- Characteristics of the household head: gender; age, age squared; highest level of education
- Characteristics of the household: Household size; real employment income; real income from social welfare grants; real income from other non-employment sources; real remittance income; poverty status and poverty gap; asset index; home ownership; land ownership; total years of education of household members; number of children age under six years; number of adults (aged 15-49 years); number of employed persons; dependency ratio; ratio of employed household members to number of dependents (dependents are children under the age of fifteen and persons that qualify to receive an old age pension from government: male 65 years or older and female 60 years or

older); extended family; experienced out-migration in previous period[8]; urban/rural place of residence; access to piped water; use of electricity as a source of energy for cooking, heating and lighting; access to flush toilet; weekly refuse removal.

In addition, given the focus of this paper in investigating the link between HIV/AIDS and migration, a number of variables approximating *HIV/AIDS-related impacts* were considered for inclusion in the departure models as independent variables. These variables included the following:

- General: affected status
- Morbidity: experienced morbidity; number of ill persons, presence of ill adult (15-49 years)
- Mortality: experienced mortality; number of recent deaths, presence of adult death (15-49 years)
- Orphan crisis: household sheltered orphaned child; number of orphaned children in household

Finally, a small number of additional independent variables were considered for inclusion in the departure models for the out-migration of ill persons and orphaned children, given the association these variables are likely to have with the probability of migration:

- Determinants of migration of *ill persons*: access to medical aid; number of persons in household with access to medical aid; person did not seek treatment; household accessed a disability grant; household accessed a care dependency grant
- Determinants of migration of *orphaned children*: household accessed a foster care grant; household accessed a child support grant

A number of determinants of out-migration included in departure models described in the literature could not be included in the estimated models, given that the relevant information was not collected and/or insufficient information

[8] According to Findlay (1987) and Donato (1992), migration runs in families and the probability of migration is higher for households with previous experience of migration. However, the findings presented in these pages provide no evidence to this effect and past migration experience was not a statistically significant determinant of out-migration in any of the departure models.

was available to calculate similar variables. These omitted determinants of out-migration included the following:

- Individual attributes: ethnicity; occupation; number of languages spoken; number of recent births
- Household attributes: life-cycle stages; links to community at destination
- Other attributes: distance to destination; cost of moving
- Community attributes: socio-economic level of development; availability of amenities

5. Evidence on out-migration in the context of the HIV/AIDS epidemic

In the following pages, the results of the departure models are reported and discussed in detail. Preceding the presentation of each departure model is a brief overview of the information on migration collected from each person that had left his or her respective household during the study period. These include the socio-demographic characteristics of these out-migrants, the reasons why they had left, what their current whereabouts were and whether and how they had contributed to the household before having left. First, however, we present some evidence on the association between migration and HIV/AIDS-related households impacts. Table 1 reports on the impact of HIV/AIDS on the probability of out-migration. A distinction is drawn between the total sample of individuals and members of affected households only. On aggregate, the classification of a household as affected increased the probability of out-migration by 25 percent. Mortality strongly enhanced the probability of out-migration, regardless of the choice of proxy of the mortality impact ($P<0.01$). An adult death increased the probability of out-migration by just more than 40 percent. The association between morbidity and out-migration, however, was relatively weak in the overall sample. Only in the case of the experience of morbidity did the probability of out-migration rise significantly ($P<0.01$), while the number of ill persons in the household exhibited a weak association with the probability of out-migration ($P<0.15$). Similarly, a larger number of orphaned children acted as a disincentive for out-migration, given the increasing burden of care this places on adult household members.

The evidence for affected households only broadly mirrors these findings (Table 1), with mortality again exhibiting a strong impact on the probability of out-migration (in the order of a third). Thus, the evidence points to the importance of health shocks associated with the HIV/AIDS epidemic in explaining differences in the probability of out-migration. In the subsequent pages, these variables will be added to the departure models to assess the extent to which HIV/AIDS impacts represent independent and statistically significant determinants of out-migration when controlling for other individual and household determinants of out-migration.

Table 1: Impact of HIV/AIDS on probability of out-migration

Household-level HIV/AIDS impacts	***Coefficient***	***P***	***95% Confidence interval***
A. Total sample (n=4272)			
Affected status (0=no, 1=yes)	0.249	0.001	0.096 - 0.402
Morbidity (0=no, 1=yes)	0.224	0.001	0.090 - 0.358
Number of ill persons	0.064	0.126	-0.018 - 0.147
Adult illness (0=no, 1=yes)	0.001	0.980	-0.150 - 0.154
Mortality (0=no, 1=yes)	0.403	<0.001	0.220 - 0.587
Number of deaths	0.390	<0.001	0.225 - 0.555
Adult death (0=no, 1=yes)	0.408	<0.001	0.200 - 0.616
Shelter orphan (0=no, 1=yes)	-0.006	0.922	-0.144 - 0.130
Number of orphans	-0.055	0.112	-0.123 - 0.012
B. Affected households (n=2869)			
Morbidity (0=no, 1=yes)	0.143	0.080	-0.016 - 0.303
Number of ill persons	0.001	0.977	-0.093 - 0.095
Adult illness (0=no, 1=yes)	-0.107	0.196	-0.270 - 0.055
Mortality (0=no, 1=yes)	0.343	<0.001	0.153 - 0.533
Number of deaths	0.338	<0.001	0.167 - 0.508
Adult death (0=no, 1=yes)	0.345	0.001	0.132 - 0.558
Shelter orphan (0=no, 1=yes)	-0.013	0.864	-0.169 - 0.142
Number of orphans	-0.052	0.181	-0.129 - 0.024

Note: Results of a pooled probit analysis with respective indicators of HIV/AIDS impacts in $period_t$ regressed on migration status in $period_{t+1}$ as sole independent variable. *Morbidity* was defined relative to the presence in the household of persons who had been continuously ill for the 30 days preceding the interview. *Mortality* was defined relative to the presence in the household of persons who had died in the six months preceding baseline or in the time that elapsed between follow-up interviews.

5.1 Out-migration in affected households and households that have not experienced morbidity or mortality

Table 2 reports on the differences between persons that had left affected households and persons that had left households that had not experienced morbidity or mortality. The early literature on migration and HIV/AIDS highlighted the danger that the predominant male migration to urban areas posed in accelerating the spread of the epidemic, resulting in calls for labour migration to avoid disrupting families and allowing male workers to migrate to the areas where they are employed with their wives and families (Lucas, 1991). Here, however, a slightly larger proportion of out-migrants were female, which may suggest that the traditional phenomenon of mainly male migration may actually be evolving into a phenomenon of female migration. Girdler-Brown (1998) also emphasise the increasing migration of South African women from rural to urban areas. The majority of out-migrants were single, including divorced, separated or widowed. In terms of age, the largest proportion of out-migrants was aged 25-49 years. The median age of out-migrants was 22 to 23 years.

In terms of familial ties, the majority of out-migrants were children, other relations or grandchildren of the head of the household (Table 2).[9] The main reasons for out-migration were mainly 'conventional', i.e. related to employment, cohabitation and education. However, out-migrants in both groups in almost a fifth of cases cited adoption or fostering as the main reason, as well as reasons related to the need to escape conflict in the household or to relocate with their parents. It is interesting to note the relatively high proportion of persons that were temporary visitors, i.e. who were in transit or who visited the particular household at the time (15 to 16 percent). (It should be noted that the household definition employed by Statistics South Africa in the *October Household Survey* probably exaggerates this pattern, given that the household is defined with reference to living arrangements over a period of one week only. Other household surveys, for example, define the household with reference to living arrangements over a longer period of time, e.g. three months or longer.) The relatively large proportion of grandchildren that have left households in the sample and the prominence of adoption and fostering as main reason for out-

[9] This paper reports and discusses the nature of these familial relations as if they have the same meaning for everyone. Caution, however, is required in such interpretation, given that these relationships may mean different things in different social and linguistic settings.

migration provides evidence of the impact of the epidemic on family life, of the growing orphan crisis in these communities and the role of the extended family in coping with this crisis (Booysen *et al*., 2003).

However, the only statistically significant differences between out-migrants from affected households and households that have not experienced morbidity or mortality is that the former migrants were more likely to have contributed to the household prior to having left ($P<0.05$)(Table 2). Almost all persons contributed to the household in monetary terms. However, there was no significant difference in the average monetary contributions of the out-migrants. Furthermore, there is weak evidence of significant differences between out-migrants in terms of destination. Out-migrants from affected households were more likely to have moved to rural areas compared to out-migrants from households that have not experienced morbidity or mortality. However, about half of out-migrants moved to areas in the close vicinity, i.e. the same or a nearby village or neighbourhood, regardless of the affected status of the household.

The above findings present relatively weak evidence of the possible post-diagnosis urban-to-rural migration of persons with HIV/AIDS. The analysis on the determinants of out-migration of ill persons from affected households presented elsewhere in these pages will shed more light on the extent to which our results supports the hypothesis of urban-to-rural migration of the infected, other things being equal.

Table 3 presents the regression results of the departure models for affected households and for households that have not experienced morbidity or mortality. Both models performed well in terms of overall statistical significance ($P<0.05$) and explain 10 and 25 percent of differences in migration status respectively. Four variables, all household-level determinants of out-migration, featured as statistically significant determinants of out-migration in both models. The probability of out-migration was higher for individuals from rural households. Kok *et al*. (2003) similarly report the probability of migration to be higher for persons from rural areas, but only in the case of labour migration.

Table 2: Comparison of characteristics of out-migrants from affected households and households that have not experienced morbidity or mortality (%)

Characteristic	***Affected households (n)***	***Households that have not experienced morbidity or mortality (n)***	***P***
Gender:			
Male	36 (52)	46 (19)	0.914
Female	64 (92)	54 (22)	
Total	*100 (144)*	*100 (41)*	
Marital status:			
Single	79 (30)	85 (35)	0.259
Married	21 (114)	15 (6)	
Total	*100 (144)*	*100 (41)*	
Contributed to household	23 (33/144)	10 (4/41)	0.043
Median monetary contribution (Rand)	400 (31)	400 (4)	0.837
Contributed in kind	9 (3/33)	0 (0/4)	
Age:			
0-5 years	7 (9)	14 (5)	0.512
6-18 years	25 (33)	17 (6)	
19-24 years	22 (29)	28 (10)	
25-49 years	33 (43)	33 (12)	
50+ years	12 (16)	8 (3)	
Total	*100 (130)*	*100 (36)*	
Median age (years)	22	23	0.426
Relation to head of household:			
Head/partner	7 (10)	5 (2)	0.917
Child	37 (53)	46 (19)	
Grandchild	16 (23)	15 (6)	
Parent	4 (6)	5 (2)	
Other relation	27 (39)	22 (9)	
Not related	9 (13)	7 (3)	
Total	*100 (144)*	*100 (41)*	
Destination:			
Immediate vicinity	51 (73)	51 (21)	0.110
Urban area	27 (38)	42 (17)	
Rural area	20 (28)	7 (3)	
Other	2 (3)	0 (0)	
Total	*100 (142)*	*100 (41)*	
Main reason for leaving:			
Employment	25 (36)	18 (7)	0.282
Cohabitation	18 (25)	25 (10)	
Education	11 (16)	23 (9)	
Illness or death	5 (7)	3 (1)	
Adoption or fostering	18 (26)	15 (6)	
Temporary visitors	17 (24)	18 (7)	
Other	6 (8)	0 (0)	
Total	*100 (142)*	*100 (40)*	

Note: Percentages may not add up to 100 due to rounding.

Membership of an extended family (defined here as a three- or four-generational household) increased the probability of out-migration by a considerable margin (in excess of a third). This provides evidence of the important role migration plays with regard to enabling a household strategy to benefit from the support available from the extended family, which as argued elsewhere, represents an important coping strategy for households having to deal with the impacts of the HIV/AIDS epidemic.

Furthermore, the probability of out-migration increased as real employment income increased. (This was also the case when total real adult equivalent income was employed as an indicator of household welfare and for non-employment income in the case of affected households.) On the one hand, migration may be more likely in households with lower levels of income, given that households may engage in labour migration as a strategy to alleviate poverty. On the other hand, more affluent households are in a position to afford the costs and risks associated with migration, thus the probability of migration may increase as household income rises (Findlay, 1987). According to Kok *et al*. (2003), the probability of labour migration in South Africa declines as household income increases, while the probability of non-employment migration increases as income increases. This suggests that some of the migration from affected households may not be related to employment and that only more affluent households may be in a position to use migration as a household strategy, as was reflected in the reasons for migration reported in Table 2 (75 percent of reasons for out-migration was not related to employment). Yet, the probability of out-migration increased in affected households as real remittance income declined. Conversely, it means that the probability of migration declined as the level of remittance income increased, which suggests that affected households that already have access to remittances are less likely to in subsequent periods send someone out looking for work. As such, there is some evidence suggesting that migration is employed by affected household as an economic response to changes in economic fortunes.

Table 3: Determinants of migration in affected households and households that have not experienced morbidity or mortality (%)

	Affected households				*Households that have not experienced morbidity or mortality*			
Determinant	***β***	***P***	***95% Confidence interval***		***B***	***P***	***95% Confidence interval***	
Individual determinants:								
Gender (male=1, female=2)	0.106	0.318	-0.102	0.314	-0.515	0.032	-0.987	-0.044
Age	-0.007	0.102	-0.015	0.001	0.089	0.003	0.031	0.146
Age square	0.000	0.181	0.000	0.000	-0.001	0.010	-0.002	0.000
Marital status (1=single, 0=married)	0.060	0.734	-0.287	0.407	1.163	0.018	0.199	2.127
Education (no education=1)								
Primary education	-0.453	0.175	-1.109	0.202	-0.163	0.801	-1.434	1.108
Secondary education	-0.185	0.578	-0.838	0.467	-0.445	0.514	-1.779	0.889
Tertiary education	-0.549	0.151	-1.298	0.200	-0.239	0.745	-1.677	1.199
Self-employed (0=no, 1=yes)	0.031	0.912	-0.522	0.584	0.107	0.848	-0.985	1.199
Economically active (0=no, 1=yes)	0.090	0.738	-0.440	0.621	-0.788	0.151	-1.863	0.287
Household variables:								
Female head (0=no, 1=yes)	0.270	0.023	0.037	0.503	0.214	0.518	-0.436	0.865
Age of household head	0.014	0.758	-0.073	0.100	0.093	0.378	-0.114	0.301
Age square of household head	-0.289	0.642	-1.506	0.929	-1.709	0.271	-4.752	1.335
Years education of household head	0.019	0.296	-0.017	0.055	-0.093	0.052	-0.188	0.001
Household size	0.186	0.003	0.065	0.307	-0.140	0.438	-0.495	0.214
Real employment income (Rand)	0.000	0.112	0.000	0.000	0.000	0.027	0.000	0.000
Real grant income (Rand)	0.000	0.419	0.000	0.000	0.001	0.166	0.000	0.002
Real other non-employment income (Rand)	0.000	0.008	0.000	0.000	-0.001	0.626	-0.003	0.002
Real remittance income (Rand)	-0.001	0.047	-0.002	0.000	0.000	0.676	-0.001	0.001
Asset index	0.016	0.709	-0.069	0.102	-0.271	0.021	-0.500	-0.041
Total years of education of household	-0.016	0.017	-0.029	-0.003	0.026	0.104	-0.005	0.058
Number of children aged under 6 years	-0.279	0.001	-0.449	-0.109	0.091	0.668	-0.323	0.504
Number of adults	-0.072	0.302	-0.210	0.065	-0.177	0.417	-0.605	0.251
Employed persons: dependents ratio	-0.285	0.289	-0.813	0.242	-0.008	0.985	-0.867	0.851
Member of an extended family (0=no, 1=yes)	0.373	0.022	0.053	0.694	0.483	0.124	-0.133	1.098

Number of employed persons	0.073	0.557	-0.170	- 0.315	0.186	0.379	-0.228	- 0.600
Informal dwelling (0=no, 1=yes)	-0.039	0.861	-0.478	- 0.400				
Out-migration in previous period (0=no, 1=yes)	-0.183	0.282	-0.515	- 0.150	-0.325	0.386	-1.061	- 0.410
Number of ill persons	0.063	0.340	-0.066	- 0.192				
Number of deaths	0.329	0.005	0.099	- 0.558				
Number of orphaned children	-0.165	0.003	-0.274	- -0.057	-0.175	0.294	-0.503	- 0.152
Place of residence (1=urban, 2=rural)	0.319	0.038	0.017	- 0.621	0.617	0.083	-0.082	- 1.315
Access to piped water (0=no, 1=yes)	-0.086	0.578	-0.387	- 0.216	0.724	0.179	-0.332	- 1.781
Electricity main source of energy (0=no, 1=yes)	0.287	0.043	0.009	- 0.566	0.251	0.436	-0.380	- 0.881
Access to flush toilet (0=no, 1=yes)	-0.216	0.189	-0.539	- 0.106	0.219	0.648	-0.722	- 1.161
Refuse removed on weekly basis (0=no, 1=yes)	0.369	0.024	0.049	- 0.689	-0.186	0.665	-1.026	- 0.654
Constant	-1.411	0.530	-5.815	- 2.993	3.558	0.523	-7.368	- 14.484
Sample (n)				*1971*				*969*
LR chi2 (P)			*79.83 (<0.05)*					*55.27 (<0.05)*
Pseudo R2				*0.100*				*0.254*

Note: Results are for a pooled probit regression. The dependent variable was coded as 0 (non-migrant) or 1 (migrant) for those persons who had migrated from the household by the time the follow-up interview was conducted. Includes only migrants aged 15 years or older, given inclusion of employment status and economic activity status amongst independent variables. Certain possible determinants of the migration of orphaned children were excluded from the model due to the fact that the respective outcomes did not vary significantly by migration status, i.e. there were too few observations in certain clusters to allow a meaningful analysis. These omitted variables include land ownership, home ownership and in the case of non-affected households, informal dwelling.

Lastly, the level of human capital (total years of education of all household members) was associated with the probability of out-migration. The sign of the coefficient, however, was different. In the case of affected households, the probability of out-migration increased as the level of human capital declined. In the case of households that have not experienced morbidity or mortality, the probability of out-migration increased with the level of human capital. In terms of the empirical evidence, education in most cases is positively associated with migration probabilities (Lauby & Stark, 1988). However, if human capital is taken to reflect the income earning potential of the household, the evidence suggests that out-migration from affected households may represent the need to improve the economic status of the household, while in the case of households that have not experienced morbidity or mortality, the evidence may suggest that only more affluent households are likely to opt for out-migration.

Additional support for this argument pertaining to the importance of out-migration as an economic coping strategy used by affected households can be found in the positive, statistically significant association between the probability of out-migration and gender of the household head (households headed by women are generally poorer than male-headed households) and household size. Bilsborrow *et al*. (1987) similarly found the probability of migration to increase with household size. According to Findlay (1987) and Lauby and Stark (1988), migrants are likely to originate from larger households, given that larger households are more likely to send a person away to contribute remittances to the household or to be cared for by someone else so as to alleviate the resource constraint in the household. Also, larger families translate into a larger supply of labour for domestic tasks or household production, which increases the likelihood of migration. The above argument makes sense insofar as affected households have been shown to be relatively poorer than households that have not experienced morbidity or mortality. Yet, most households in the study population can be described as disadvantaged, given generally low levels of household welfare (Booysen *et al*., 2003). In fact, the departure model for households that have not experienced morbidity or mortality also provides evidence of out-migration being an economic strategy. In this case, the probability of out-migration increased as the level of education of the household head declined and as the asset index declined. Therefore, the evidence supports the fact that migration in general represents an important economic coping strategy for poor households in developing countries.

Equally if not more important, however, is the extent to which individual determinants of out-migration represent statistically significant determinants of

out-migration from households that have not experienced morbidity of mortality, but not so for out-migration from affected households. In households that have not experienced morbidity or mortality, the probability of migration was higher for males (being male increased the probability of out-migration by just more than 50 percent), increased marginally with age, but declined with age squared, and was substantially higher for single persons. Similarly, Donato (1992), Fraser (1993) and Kok *et al*. (2003) found the likelihood of migration to be higher amongst males, given that men generally have better employment prospects than women. This finding is common to empirical work on the determinants of migration (Greenwood, 1985). Anyanwu (1992) also found migration to be selective of males, as well as of single people.

Empirical evidence on the association between age and migration suggests that this relationship should be a negative one (Greenwood, 1985; Brown & Goetz, 1987; Fraser, 1993), given that "younger migrants face greater lifetime returns to movements and lower costs of relocation" (Bilsborrow *et al*., 1987: 200). In the case of affected households, the association between age and probability of migration was indeed negative, but statistically weak (P=0.10). Junming (1997) and Posel (1999), however, argue that the relationship with age is non-linear, which is reflected in a positive, significant association with age and a negative, significant association with age squared. This makes sense insofar as younger persons are generally less mobile, as are older persons. Adults in turn are economically active and are the most mobile (Kok *et al*., 2003). Our results bear this out in the case of households that have not experienced morbidity or mortality, with age and age squared being associated positively and negatively respectively with the probability of out-migration.

Hence, the evidence on the determinants of out-migration in households that have not experienced morbidity or mortality fits much of the evidence on the role of individual-level variables in explaining out-migration. This relative unimportance of individual-level variables in explaining out-migration from affected households may, as explained elsewhere, on the one hand suggest that out-migration in these cases is a household rather than an individual strategy, given the more important role of household-level variables in explaining out-migration. On the other hand, these results may also reflect the wide variety of reasons for out-migration from affected households, which include economic and non-economic motivations (Table 2). For this reason, Kok *et al*. (2003) reports results for departure models for labour migration and non-labour migration. Their results highlight the extent to which the associations of the likelihood of out-migration with age, gender, education, income and place of

residence differ across these two types of migrants. We will consider similar avenues in future work to elucidate the different migration patterns within affected households, particularly as the data from additional rounds of the panel study will increase the number of out-migrants in each of the sub-samples.

Significantly, in the case of affected households, the number of recent deaths again represents a statistically significant determinant of out-migration, with one death increasing the probability of migration by about a third. Hence, the evidence again underscores the importance of health shocks associated with the HIV/AIDS epidemic in explaining differences in the probability of out-migration. As reported in Table 1, a larger number of orphaned children acted as a disincentive for out-migration, given the increasing burden of care this places on adult household members. The probability of out-migration declined by 17 percent for every additional orphaned child that joined the household. In addition, the probability of out-migration declined as the number of young children increased, again emphasising the extent to which the presence of children is a disincentive for out-migration (Brockerhoff & Eu, 1993).

Lastly, there is also some evidence that access or lack of access to public amenities can influence migration decisions. In affected households, the probability of out-migration increased with access to electricity and refuse removal. However, one would have expected the probability of out-migration to decline as access to public amenities improve. Findlay (1987) argues that migration decisions will be influenced by the presence or absence of amenities. The model in Table 3 provides some evidence, albeit rather weak, of the impact of the availability of amenities on out-migration. Hence, this may present a spurious result, particularly in light of the absence of other variables to assess access to a wider range of public and private amenities.

5.2 Out-migration of ill persons from affected households

In this section, the characteristics and determinants of the out-migration of ill persons from affected households are explored in more detail. A total of 22 persons that were continuously ill in the month leading up to the interview had left their respective households by the time of the follow-up interview. The age distribution across these cases of illness suggests that the analysis in part is indicative of HIV/AIDS-related migration patterns. Just over two fifths of the ill

out-migrants were aged 19-49 years; the average age was 41 (Table 4). However, a substantial proportion of the out-migrants were relatively old (50+ years). The majority of ill persons that left were children of the head of the household, while almost two fifths were members of the extended family. i.e. parents, grandchildren or other relations of the head of household (Table 4). A relatively large proportion of persons had headed the household or were a husband/wife/partner of the head of the household.

More than half of persons left for destinations in close proximity to their original place of residence, i.e. the same or a nearby town/village. There was no clear preference for urban over rural destinations. Most ill persons left to be close to their family and moved with or to be with their parents or grandparents, which fulfils a caring, adoption or fostering role. The second most prominent reason for migration was related to cohabitation followed by visitation. Respondents attributed the out-migration of ill persons directly to illness or death in only 10 percent of the cases. Finally, it is worth noting that half of these persons contributed to their respective households before leaving. Whilst one person contributed to the household in kind, the others contributed to the household in monetary terms. The above evidence suggests that the duty to care for the ill is being shared amongst related households in the same community, again emphasising the role of the extended family in coping with the HIV/AIDS epidemic.

The departure model of the out-migration of ill persons from affected households performed well in terms of overall statistical significance ($P<0.05$) and explains 61 percent of differences in migration status. Significantly, not one individual attribute featured as a statistically significant determinant of out-migration. This hints at the relative important role of household determinants of out-migration compared to individual determinants of out-migration.

Table 4: Characteristics of ill persons that had left affected households (%)

Characteristic	***Percentage (n)***
Gender:	
Male	14 (3)
Female	86 (19)
Total	*100 (22)*
Marital status:	
Married	18 (4)
Single	82 (18)
Total	*100 (22)*
Contributed to household	50 (11/22)
Median monetary contribution (Rand)	620 (10)
Contributed in kind	5 (1/11)
Age:	
0-5 years	9 (2)
6-18 years	5 (1)
19-24 years	18 (4)
25-49 years	23 (5)
50+ years	46 (10)
Total	*100 (22)*
Median age (years)	41 (22)
Relation to head of household:	
Head/partner	18 (4)
Child	36 (8)
Grandchild	5 (1)
Parent	14 (3)
Other relation	18 (4)
Not related	9 (2)
Total	*100 (22)*
Destination:	
Immediate vicinity	55 (12)
Urban area	18 (4)
Rural area	18 (4)
Other	9 (2)
Total	*100 (22)*
Main reason for leaving:	
Employment	9 (2)
Cohabitation	18 (4)
Education	5 (1)
Illness or death	9 (2)
Adoption or fostering	27 (6)
Temporary visitors	18 (4)
Other	14 (3)
Total	*100 (22)*

Note: Percentages may not add up to 100 due to rounding.

In part, the evidence suggests that out-migration may be an economic strategy aimed at helping households cope with welfare shocks (Table 5). The probability of out-migration increased as household size increased, as the level of human capital (total years of education) declined and as real remittance

income declined. On the other hand, some of the evidence in Table 5 suggests that more affluent household may be more likely to be able to afford to send ill persons away to live elsewhere.

Table 5: Determinants of out-migration of ill persons from affected households (%)

Determinant	***Coefficient***	***P***	***95% Confidence interval***	
Individual determinants:				
Gender (male=1, female=2)	0.760	0.644	-2.463	- 3.983
Age	0.035	0.605	-0.097	- 0.167
Age square	-0.000	0.851	-0.002	- 0.001
Marital status (1=single, 0=married)	1.175	0.362	-1.354	- 3.705
Household variables:				
Female head (0=no, 1=yes)	0.417	0.767	-2.340	- 3.174
Age of household head	0.420	0.440	-0.646	- 1.487
Age square of household head	-7.035	0.361	-22.137	- 8.068
Household size	2.701	0.086	-0.386	- 5.788
Real employment income (Rand)	0.001	0.080	0.000	- 0.002
Real grant income (Rand)	0.000	0.971	-0.006	- 0.006
Real other non-employment income (Rand)	0.005	0.133	-0.002	- 0.012
Real remittance income (Rand)	-0.007	0.145	-0.015	- 0.002
Asset index	0.649	0.461	-1.077	- 2.376
Total years of education of household	-0.170	0.050	-0.340	- 0.000
Number of children aged under 6 years	-2.154	0.109	-4.784	- 0.477
Number of adults	-3.334	0.096	-7.264	- 0.596
Employed persons: dependents ratio	2.457	0.351	-2.704	- 7.618
Number of employed persons	0.610	0.391	-0.783	- 2.003
Place of residence (1=urban, 2=rural)	1.689	0.380	-2.086	- 5.464
Access to piped water (0=no, 1=yes)	-1.951	0.318	-5.778	- 1.877
Electricity main source of energy (0=no, 1=yes)	3.960	0.117	-0.996	- 8.916
Access to flush toilet (0=no, 1=yes)	0.394	0.874	-4.462	- 5.249
Refuse removed on weekly basis (0=no, 1=yes)	-3.949	0.224	-10.314	- 2.415
Number of ill persons	1.173	0.289	-0.993	- 3.338
Number of deaths	-1.264	0.460	-4.617	- 2.089
Number of orphaned children	-0.101	0.849	-1.145	- 0.942
Access to disability grant (0=no, 1=yes)	2.473	0.229	-1.560	- 6.507
Did not seek treatment for illness (0=no, 1=yes)	-3.435	0.270	-9.538	- 2.668
Constant	16.662	0.476	-29.189	- 62.513
Sample (n)				*288*
LR chi2 (P)				*49.63(<0.05)*
Pseudo R2				*0.616*

Notes: Results are for a pooled probit regression. The dependent variable was coded as 0 (non-migrant) or 1 (migrant) for those persons who had been continuously ill for the 30 days preceding the interview and who had migrated from the household by the time the follow-up interview was conducted. Certain possible determinants of the migration of ill persons were excluded from the model due to the fact that the respective outcomes did not vary significantly by migration status, i.e. there were too few observations in certain clusters to allow a meaningful analysis. These omitted variables include informal dwelling, extended family and past experiences of migration, as well as access to medical aid and a care dependency grant. Employment and economic activity status were excluded from the model due to the fact that almost all these individuals were unemployed and economically inactive.

The probability of out-migration increased as real employment income and other non-employment income increased. The probability of household migration was also higher for households that employed electricity as the main source of energy for eating, heating and lighting, which represents but a proxy of the socio-economic status of the household. The main problem of course with this analysis is that one is not aware of the health state of the person preceding or following their out-migration. The only thing one knows is that the person had been ill at some stage and had left his or her respective household by the time of the follow-up interview. Thus, one possible explanation is that the ill person had recuperated from his or her illness and had left in search of employment or to take up a job, with the aim of improving the economic status of the household. On the other hand, the ill person may have been sent away because the original household could not cope with the burden of care on the household labour supply and purse. The latter argument is backed in part by the evidence in Table 5 that shows that the probability of out-migration increased as the number of adults and young children declined. Given the relatively few cases in which the respondent cited employment as the main reason for the out-migration of the ill person (Table 4), it is probably a case of the latter rather than the former.

5.3 Out-migration of orphaned children from affected households

The proportion of households in the study population that have sheltered an orphaned child has steadily increased over time, as has rates of orphanhood. This presents stark evidence of the mounting orphan crisis in these two communities, as well as the fact that entire communities, rather than affected households *per se* have to cope with this crisis (Booysen *et al*., 2003). The evidently high mobility of children and grandchildren, in particular, hints at the HIV/AIDS related orphan crisis. Therefore, this paper also aims to investigate the characteristics and determinants of the out-migration of orphaned children from affected households. Orphans here represent children aged 15 years or under that had lost at least one parent.[10] A total of 13 orphans had left affected households over the study period. Given the small sample size, the evidence in

[10] Caution is required insofar as these findings are based on self-reported orphan status (based on whether the child's father and/or mother was alive at the time). This could result in the over-reporting of paternal orphanhood particularly as the father may be reported as deceased where the mother does not know the father of her child and/or the father is estranged from the child's mother or family.

this paper presents only an indication of the migration patterns of orphaned children.

The majority of orphaned children that left affected households were female and of school-going age, i.e. aged 6-15 years (Table 6). The majority of orphaned children (85 percent) represented members of the extended family, i.e. grandchildren or other relations of the head of the household. More than half of the orphaned children left for destinations in close proximity to their original place of residence, i.e. the same or a nearby town/village. There was no clear preference for urban over rural destinations. Most orphaned children left to be close to their family and moved with or to be with their parents or grandparents, which fulfils a caring, adoption or fostering role. The second most prominent reason for migration was education. Respondents attributed the out-migration of orphans directly to illness or death in 15 percent of cases only. Given their age, not one of the orphaned children contributed to their respective households before leaving. This evidence emphasises the important role of the extended family in coping with the orphan crisis of the HIV/AIDS epidemic.

Table 6: Characteristics of orphaned children that had left affected households (%)

Characteristic	***Percentage (n)***
Gender:	
Male	23 (3)
Female	77 (10)
Total	*100 (13)*
Age:	
0-5 years	15 (2)
6-15 years	85 (11)
Total	*100 (13)*
Median age (years)	11 (13)
Relation to head of household:	
Child	15 (2)
Grandchild	23 (3)
Other relation	62 (8)
Total	*100 (13)*
Destination:	
Immediate vicinity	54 (7)
Urban area	23 (3)
Rural area	23 (3)
Total	*100 (13)*
Main reason for leaving:	
Education	31 (4)
Illness or death	15 (2)
Adoption or fostering	39 (5)
Temporary visitors	15 (2)
Total	*100 (13)*

Note: Percentages may not add up to 100 due to rounding.

A number of individual and household variables were statistically significant in explaining the out-migration of orphaned children from affected households. The departure model performed well in terms of overall statistical significance ($P<0.05$) and explained 51 percent of differences in the out-migration status of orphaned children. In terms of the individual attributes, migrating orphans were likely to be female and to have completed a higher standard at school. According to Bonney and Love (1992), household factors may also prove to be particularly important in explaining migration processes in the case of younger migrants. The results presented in Table 7 bear this out. Interestingly, the probability of out-migration increased as the number of children aged five years or under declined. This hints at the role older children may play in taking care of younger siblings.

There is also evidence to suggest that the out-migration of orphans may be an economic strategy to help cope with the orphan crisis, i.e. a response by the household to its inability to care for these children (Young & Ansell, 2003b) (Table 7). Migrants are likely to originate from larger households, given that larger households are more likely to send a person away to contribute remittances to the household so as to help feed the many mouths. The probability of out-migration increased as the ratio of employed household members to dependents declined, thus suggesting out-migration to be more likely where lack of resources is more acute. The number of deaths was a weak predictor of the probability of out-migration ($P=0.18$), suggesting that only some orphaned children move to live with other relatives following the death of a parent. According to Findlay (1987), migration decisions will be influenced by the presence or absence of amenities. One would expect the probability of out-migration to decline as access to public amenities improve. In this case, the probability of out-migration was higher for households that did not have access to waterborne sanitation (a flush toilet). Given that access to sanitation presents some proxy of living conditions, affected households living in poor conditions again were relatively more likely to have sent an orphaned child to live elsewhere. Again therefore the evidence hints at the importance of migration as a response to the socio-economic impact of the HIV/AIDS epidemic. Yet, the number of employed persons in the household saw the probability of out-migration increase, all other things being equal, which suggests that more affluent households may be in a position to afford to send orphaned children to be taken care of by family relations living elsewhere. Therefore, the evidence for the out-migration of orphans as an economic response to shocks to household

welfare is not strong. Ultimately, these migrations are driven by complex social forces rather than by pure economic considerations (Young & Ansell, 2003a).

Table 7: Determinants of out-migration of orphans from affected households (%)

Determinant	***Coefficient***	***P***	***95% Confidence interval***	
Individual determinants:				
Gender (male=1, female=2)	1.503	0.074	-0.145	- 3.151
Age	-0.277	0.343	-0.849	- 0.295
Age square	0.003	0.843	-0.024	- 0.030
Years of education	0.240	0.106	-0.051	- 0.530
Household variables:				
Female headed (0=no, 1=yes)	-0.043	0.940	-1.164	- 1.078
Age of household head	0.250	0.331	-0.255	- 0.756
Age square of household head	-3.884	0.293	-11.118	- 3.349
Household size	0.285	0.429	-0.421	- 0.991
Real employment income (Rand)	0.000	0.501	0.000	- 0.001
Real grant income (Rand)	-0.001	0.396	-0.003	- 0.001
Real other non-employment income (Rand)	0.000	0.769	-0.002	- 0.002
Real remittance income (Rand)	0.002	0.405	-0.002	- 0.006
Asset index	-0.259	0.329	-0.779	- 0.261
Total years of education of household	-0.002	0.965	-0.071	- 0.068
Number of children aged under 6 years	-2.655	0.047	-5.275	- -0.035
Number of adults	-0.566	0.346	-1.743	- 0.611
Employed persons: dependents ratio	-3.100	0.064	-6.379	- 0.178
Number of employed persons	1.277	0.063	-0.068	- 2.622
Informal dwelling (0=no, 1=yes)	-1.116	0.426	-3.862	- 1.629
Member of an extended family (0=no, 1=yes)	-0.040	0.969	-2.057	- 1.978
Place of residence (1=urban, 2=rural)	0.138	0.898	-1.961	- 2.236
Access to piped water (0=no, 1=yes)	0.554	0.534	-1.190	- 2.298
Electricity main source of energy (0=no, 1=yes)	1.136	0.296	-0.995	- 3.266
Access to flush toilet (0=no, 1=yes)	-1.406	0.108	-3.120	- 0.308
Refuse removed on weekly basis (0=no, 1=yes)	-0.669	0.502	-2.624	- 1.285
Number of ill persons	0.352	0.264	-0.266	- 0.970
Number of deaths	0.707	0.180	-0.326	- 1.740
Number of orphaned children	-0.219	0.453	-0.791	- 0.353
Access to child support grant (0=no, 1=yes)	-0.112	0.903	-1.916	- 1.692
Constant	13.190	0.332	-13.468	- 39.848
Sample (n)				*290*
LR chi2 (P)				*50.98(<0.05)*
Pseudo R2				*0.510*

Notes: Results are for a pooled probit regression. The dependent variable was coded as 0 (non-migrant) or 1 (migrant) for those children aged fifteen years or under whose mother or father was not alive and who had migrated from the household by the time the follow-up interview was conducted. Certain possible determinants of the migration of orphaned children were excluded from the model due to the fact that the respective outcomes did not vary significantly by migration status, i.e. there were too few observations in certain clusters to allow a meaningful analysis. These omitted variables include access to a foster care grant and care dependence grant and past experience of migration. Marital status and employed and economic activity status were excluded from the model due to the fact that all the individuals were single, unemployed and economically inactive.

6. Discussion and conclusion

Based on the results from the departure models employed here to assess the determinants of out-migration, individual determinants played a role of lesser importance in explaining out-migration from affected households. In the case of households that have not experienced morbidity of mortality, individual attributes such as gender and age were significant determinants of out-migration, as is suggested by much of the empirical literature on out-migration. Moreover, a number of household-level variables featured as important determinants of out-migration in the context of the HIV/AIDS epidemic, notably the gender of the household head, place of residence, family structure, the dependency ratio, human capital and household size (all indicators of lower socio-economic status). Furthermore, the evidence suggests that health shocks associated with the HIV/AIDS epidemic, particularly mortality, independently explain part of the observed differences in out-migration from affected households, be it of individuals in general or of ill persons or orphaned children that belong to affected households. Thus, the evidence suggests that out-migration is an important strategy for poorer households having to cope with the HIV/AIDS epidemic, both as an economic survival strategy and as a social strategy aimed at accessing support from the extended family.

The paper, however, also lays bare the complexity of migration, with persons reportedly having left their respective households for a variety of reasons and the same departure model providing evidence that probabilities of out-migration are associated both negatively and positively with socio-economic status. In methodological terms, this requires one to estimate separate departure models for different types of migration (e.g. labour versus non-labour migration) in order to elucidate migration patterns in affected households. Such further analysis will become more feasible as data from additional rounds of this panel study becomes available, thus increasing the number of out-migrants that left their respective households for similar reasons.

The observed out-migration of ill persons from affected households suggests that the post-diagnosis migration of infected persons is important and needs to be researched more extensively. Migration has budgetary implications, given that in South Africa, as in many other countries, conditional grants for HIV/AIDS-related programmes are allocated according to HIV-prevalence rates based on the province in which the person was diagnosed. For example, the size of the conditional grants allocated to provinces for funding Voluntary Counselling and Testing (VCT), Community Home-based Care (CHBC) and

Life Skills programmes is determined, amongst others, by HIV/AIDS prevalence rates reported in the annual antenatal survey (Hickey, 2001). The evidence suggests that some infected persons are migrating elsewhere once diagnosed and once they start experiencing AIDS symptoms (e.g. persons may leave the province where they work for the province where their families reside). As a result, budgetary allocations may be sub-optimal and may discriminate against those provinces that are likely to, in future years, experience an increasing burden on health care services. This increase in the burden on health care services need not only arise from the rising influx of HIV/AIDS patients from elsewhere, but may also be caused by the HIV/AIDS epidemic peaking in the local population (Rumley *et al*., 1991). In fact, evidence on inter-provincial migration patterns, although scarce, suggest that the provinces with the highest HIV prevalence rates (i.e. those provinces prioritised in the allocation of conditional grants for HIV/AIDS programmes) are the largest net recipients of migrants (Haldenwang, 2001). This implies that the increased urban to rural migration of infected persons in later stages of the epidemic may result in resource allocations being relatively ineffective in matching treatment needs.

Lastly, the paper also emphasises the complexity of movements of children associated with the HIV/AIDS epidemic. The departure model for orphaned children from affected households shows that such out-migration may be an economic strategy adopted by households to cope with the orphan crisis. However, the departure model for affected households in general suggests that the orphan crisis may inhibit out-migration, with the probability of out-migration declining as the number of orphaned children sheltered by the household increase. Thus, the orphan crisis may obstruct the normal migratory responses of households to survival crises. This raises questions regarding the types of settings that would provide the best type of care for orphans and vulnerable children (e.g. whether it is better for these children to stay with their families or to be taken care of by their grandparents or other members of the extended family). In both cases, it necessitates policy interventions that will support orphaned and vulnerable children in the most supportive setting. If out-migration is feasible as an economic strategy to help households cope with this crisis, support should reach children even if they choose to migrate and reside with members of the extended family. If the presence of orphans in the household in turn constrains migration, then social welfare grants such as the foster care and child support grant may be important in enabling these families to care for orphaned children. Unfortunately, however, we know relatively little

of the extent to which these public transfers actually benefit the intended recipients. Thus, research on the migration of orphaned children and on the incentives created by social transfers, including incentives for migration can combine to assess the appropriateness of these interventions in comparison to other possible interventions such as education grants, feeding programmes at school, and the provision of pre-schools.

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