AIDS Mortality and the mobility of children in KwaZulu-Natal, South Africa

Kathleen Ford [1]

Victoria Hosegood[2,3]

1. Department of Epidemiology, School of Public Health, University of Michigan, Ann Arbor, MI 48109-2029

2. Africa Centre for Health and Population Studies, PO Box 198, Mtubatuba 3935, KwaZulu Natal, South Africa.

3. Centre for Population Studies, London School of Hygiene and Tropical Medicine, 49-51 Bedford Square, London, WC1E 3DP, UK.

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Abstract

The focus of this paper is on the impact of parental and household AIDS and other mortality on the mobility patterns of children. Using proportional hazard models, we evaluated four groups of factors related to the mobility of the child. These factors include a) demographic characteristics of the child and the relationship of the child's mother and father to the household, 2) the AIDS mortality and other mortality of the child's parents, 3) the demographic and socioeconomic characteristics of the household, and 4) the AIDS and other mortality experience of the household. Data included two years of longitudinal data on 41,000 children from the demographic surveillance system of the Africa Centre in rural KwaZulu-Natal, South Africa. Demographic variables (age and gender), kinship ties (parents' relationship to the household), the mortality of the parents, the demographic composition of the household, and household mortality were associated with child mobility. Mortality from causes other than AIDS was more likely to result in the move of a child than was AIDS mortality.

Due the high levels of mortality from AIDS, orphanhood has become a very serious problem in Africa (Grassily and Timaeus, 2003; UNICEF, 2003; and others). In 1993, over 11 million children in sub-Saharan Africa have lost one or both parents to AIDS (UNICEF, 2003). Concern has been expressed among many aspects of these children's welfare including nutrition and health (Panpanich, Brabin, Gonani, & Graham, 1999; Lindblade, Odhiambo, Rosen, & DeCock, 2003, Ainsworth & Semali, 2000), access to schooling (Nyamukapa, Foster & Gregson, 2003; Ainsworth & Semali, 2003; Case, Paxton, & Ableidinger, 2003; Bicego, Rutstein, & Johnson, 2003) and emotional well-being (Sengundo & Nambi, 1997). Results suggest that children who loose a parent, particularly children who loose their mother, are often disadvantaged in terms of schooling and other resources. Children who remain with a surviving parent may fare better than orphans who are sent to live with other families.

While the migration of children may have important implications for their welfare, very few studies are available on child migration in Africa. In South Africa, a review of the literature revealed only a small number of qualitative studies (Jones, 1993; Van de Waal, 1996). A previous bivariate analysis of children living in a rural area of Kwazulu-Natal, South Africa established that child migration in the study area was related to the child's age (children under age five were more likely to move than older children), gender (males more likely to move), parental migration and mortality (increased mobility) and adult and child mortality (increased mobility) (Hosegood and Ford, 2003).

Young and Ansell (2003) conducted a qualitative multi-method study of children in Lesotho and Malawi who were sent to live with relatives because of deaths in their own families or because the relatives needed assistance. The research findings revealed that children sent to live with kin resident elsewhere often travel long distances and between urban and rural areas. These children faced a series of difficulties associated with migration, particularly in integrating into new communities and families.

The focus of this paper is on the impact of parental and household AIDS and other mortality on the mobility patterns of children. Using proportional hazard models, we evaluated four groups of factors related to the mobility of the child. These factors include a) demographic characteristics of the child and the relationship of the child's mother and father to the household, 2) the AIDS mortality and other mortality

of the child's parents, 3) the demographic and socioeconomic characteristics of the household, and 4) the AIDS and other mortality experience of the household.

We hypothesize that first of all, age and gender will be related to mobility. The youngest group of children, those less than school age will be more likely to move than other children. Furthermore, male children may also be less likely to move. These basic demographic variables reflect children's degree of involvement in the community through school attendance or other household and community activities.

Furthermore, kinship ties will affect the likelihood of moving. The legacy of the Apartheid Group Areas Act and the labor migration system mean that many members of rural households spend considerable periods of time residing elsewhere, in order to be closer to a place of work, to accompany other labor migrants, to obtain care and support, and to attend school. As discussed below, the demographic surveillance system of the Africa Centre was designed to measure this fluidity by collecting data on resident as well as non-resident members of households. This area has a very low marriage rate (Hosegood and Preston-Whyte, 2002) and while children with living mothers may be most likely to live with their mothers, the child may also have ties to households for which the father is a resident or non-resident and receive care or other support form these households.

Third, we expect that the socio-economic status and the demographic composition of the household will have an effect on mobility. Children will be less likely to leave household with more assets. They will also be less likely to leave households where there are more adults and more children. These households may be better able to care for children whose parents have died. Since grandparents often have responsibility for child care, the number of persons over 60 may also reduce mobility of children, although many grandparents are younger than 60 in this area.

Finally, we expect both household and parental mortality to increase mobility. The loss of a caregiver or a source of income may lead to relocation of children due to financial hardship or the need to find another caregiver for the child.

Study area

The study area is part of the rural district of Umkhanyakude in northern KwaZulu Natal. It is situated about 250km north of the provincial capital of Durban (Figure 1). The study area includes both land under tribal authority that was designated as a Zulu 'homeland' under South Africa's former apartheid policy and a

township under municipal authority. Homesteads in tribal land are widely dispersed with no village structure. Infrastructure is poor. In 2001 only 13% of households had access to piped or public tapped water. Although this is a rural area, there is little subsistence agriculture. Most households rely on waged income and pensions. Unemployment is high: 67% of women and 56% of men aged 16-59 were unemployed in 2001 (Hosegood, 2002). Few local employment opportunities exist and consequently labour migration is high. Approximately 35% of female household members and 40% of men aged 18 years or more reside outside the area (Hosegood & Timaeus, 2001). Health services include a district hospital and a network of 10 community clinics and two mobile clinic teams.

KwaZulu Natal is the province of South Africa with the highest HIV prevalence rate among antenatal clinic attendees. An antenatal survey conducted in the study area in 1998 found that 41% (95% CI: 34.7-47.9) of pregnant women were HIV-infected (Wilkinson et al., 1999). Mortality in the study area rose sharply in the late-1990s. AIDS, with or without tuberculosis, was the leading cause of death in adulthood in 2000 (48%) (Hosegood et al., 2002). AIDS causes 73% and 61 % of female and male deaths respectively at ages 15-44.

Data sources

The Africa Centre Demographic Information System (ACDIS) started data collection on 1st January 2000. The study area was mapped and all households registered. The study population includes all household members, both resident and non-resident. Demographic and health information is collected every four months from all registered households and individuals. It includes reports of all births, deaths and moves between households as well as in and out of the area. The conceptual framework and rationales underlying the eligibility criteria and organization of the data are described in detail elsewhere (Hosegood and Solarsh, 2001). The following section summarizes some of these aspects.

Eligibility criteria for individual and household registration

In ACDIS, three primary subjects are observed longitudinally: physical structures (bounded structures), households and individuals. The conceptual framework for ACDIS is based upon the definitions, eligibility criteria, and relationships between these subjects. The concepts are illustrated schematically in Figure 1. Membership and residency, two features of individuals and households, are key concepts used to organize and maintain the temporal integrity of the longitudinal data.
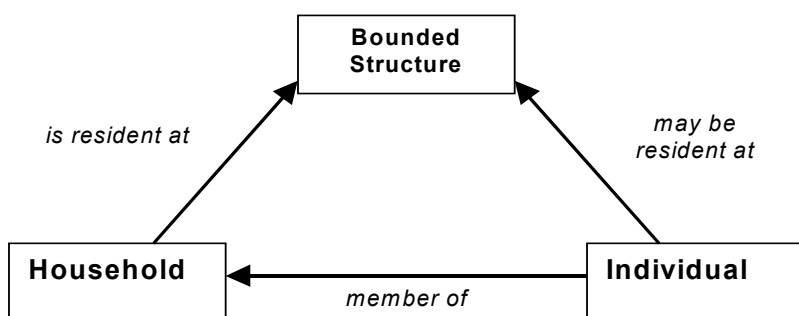
Figure 1. Membership and residency criteria relating the three main ACDIS subjects

Bounded structures

Given the complex social dynamics and mobility of the population in areas such as rural KwaZulu Natal, it is important to distinguish between a physical place (homestead/facility) and the social group (household) that is resident at that place. This distinction is also recognised by local communities with a household being called *umndeni* in Zulu and a homestead being called *umuzi.* ACDIS defines two types of physical place: homesteads whose intended main purpose is to provide accommodation, and facilities (schools, clinics, shops, churches) that provide services. The term 'bounded structure' is used to refer to both. Each eligible bounded structure is registered and mapped as identified by fieldworkers.

Households

All bounded structures are visited and data are collected about previously registered households, as well as new households that have either in-migrated or newly formed. A household is eligible for registration if it is resident at a bounded structure (where it must have at least one resident member). Changes in households' composition (members), place of residence (migration), and headship are updated at each round. Respondents are asked to list all the people that they consider to be members of their household. This includes any members who have died or otherwise ceased to be members in the four months prior to the visit.

Individuals and household members

In ACDIS, individuals are eligible for registration provided that they are considered to be a member of a household within the demographic surveillance area (DSA). Residence within the DSA is not a criterion, although information about residency is recorded. Eligible members must have spent at least one

night in residence in the 12 months prior to registration. Routine demographic and health data are collected for both resident and non-resident members.

Household membership may change several times over a person's lifetime. Babies are usually considered to be members of their mother's household though they may also have other social connections, for example with their father's household in the case of unmarried parents. In adult life, individuals may join new households when they change their social allegiances and residence, for example, upon marriage. Household membership may also end without a change in residency, as in the case of a non-resident member who does not maintain contact with the household and is eventually excluded from the social group. By keeping membership and residency distinct, ACDIS can record a change in the status of one attribute independent of the other.

Residency episodes for individuals and households are handled in a similar way within ACDIS. A resident individual or household must be resident at a bounded structure within the DSA. Household members self-report their place of residence. Typically this is the place where they keep their daily belongings and spend most nights. An individual can only be recorded as resident at one bounded structure at any point in time. At each fieldworker visit any change in residency (i.e. in- or out-migration) is recorded, together with information about the origin or destination and the date of the move.

Migration events

When member has been identified as having in- or out-migrated, information is collected about the migration event. A migration notification form is completed that records whether the individual has moved alone, moved together with one or more other members of the household, or whether the household as a whole has migrated.

Multiple household membership

In ACDIS any individual who is a member of several households within the DSA simultaneously is recorded as a member of all of them. The rationale for this design is that this social phenomenon has been reported by ethnographic studies in both the Hlabisa district (Hosegood & Solarsh, 2001) and other parts of South Africa (Van de Waal, 2006; Dayton & Ainsworth, 2002; Ross, 1996; Spiegel, 1996; Murray, 1980). Multiple memberships often arise in 'stretched household' arrangements where members reside in different places (Spiegel, 1996). Such individuals include rural-to-urban labour migrants, who continue to be

members of rural households whilst forming or joining other households in an urban area. However, people can also have multiple household memberships within a relatively small area such as the DSA.

Verbal autopsy technique and case definitions

All notified deaths (of both residents and non-residents) are followed up by a verbal autopsy interview. It is conducted by a trained nurse with the closest caregiver of the deceased. The interview includes an open disease history, a checklist of signs and symptoms, and a structured questionnaire. The questionnaire was developed following local anthropological and clinical research.

Unlike much of sub-Saharan Africa, this area is characterised by fairly easy access to private and public health care. Thus, most people attend a clinic, hospital or a GP surgery prior to death, although only 40% die in hospital. In addition, the health district operates tuberculosis, malaria and chronic disease programmes. Informants are therefore often able to provide clinical or pathology records, or recall the diagnosis made by health professionals. Few patients have tested for HIV or disclosed their status to their caregivers (Moitse, 2003).

Two clinicians with over 10 years of experience in Africa independently assigned the cause of death using the information collected in the verbal autopsy and their clinical judgment. Although the assessors were not restricted by an AIDS case definition, in only seven cases diagnosed as AIDS deaths (<2%) was the following profile absent: three major signs of the WHO definition (severe weight loss, chronic diarrhoea and prolonged fever) plus a combination of the following: Kaposi sarcoma, pruritic dermatitis or shingles, severe thrush with dysphagia and other mouth infections, severe neurological impairment including cryptococcus meningitis and cerebral lymphoma, lymphadenopathy, previous or current tuberculosis infection, shortness of breath, and pneumonia. Supportive evidence included the recent death of partners and young children due to AIDS or AIDS-related symptoms. Verbal autopsy diagnoses for individuals who died in the local district hospital were validated against their medical notes.

Statistical methods.

The analyses in this paper use a sample of residency episodes from about 34,000 children age 0-17 at the start of the episode. The period of observation is for two years, 1st Jan 2000 to 1st Jan 2002. A data file was constructed for each residency episode observed for these children. A residency

episode started either at 1/1/2000 or when the child migrated into the DSA. A residency episode ended when the child migrated either within or outside the DSA , died, or the period of observation ended.

Cox proportional hazard models were used to estimate the hazard rates for migration. The STATA 8 statistical package was used. Standard errors of the hazard rates were adjusted for clustering due to multiple episodes per child and for children in the same household.

Measures.

Move. A move was defined any time a child moved to another residence either within or outside of the DSS area. Moves include both individual and household moves, although the majority are individual. Moves (migration events) are not synonymous with a change in household membership. For example, children may continue to be non-resident members of households after they have out-migrated. However, changes in membership and residency may often be coterminous.   For example, children may join a household when they move in.

Age of child. Age of child at the beginning of the episode was coded from single years into four variables to represent stages of development. These included ages 0-2, ages 3-6,ages 7-12, and ages 13-17.

Gender. Gender of child was coded male or female.

Kinship ties. Kinship ties to the household were coded in terms of the parents' relationship to the household. Two measures were coded including whether each parent was a resident or non resident member of the household.

Survival and mortality. Survival or mortality status of mother was coded as a number of dummy variables including mother alive at start of episode, mother died during episode, mother died of AIDS during episode, mother died of other causes during episode. Survival status of father was defined in the same way.

Household characteristics.   A number of household characteristics were included. First an asset index was constructed from a series of questions concerning whether or not the household owned certain items such as televisions, toasters, and so on.   Measures for the number of adults, children, and older persons (age 60 or more) were also included.

Household mortality experience. Household mortality experience included three variables: the number of deaths, the number of deaths due to AIDS, and the number of violent or accidental deaths to persons age 15 or more.

Results

Characteristics of children, parents, and households in residency episodes.

Tables 1 shows the characteristics of the children, survival or their parents, and their parents residency status in the residency episodes. About 95% had a surviving mother at the start of the household and 88% has a surviving mother. Only 2% had no surviving parent. About 23% of the children were age 2 or less, 21% age 3-6, 31% age 7-12, and 25% age 13-17. Most of the children were reported to be in school fulltime including 98% of children age 7-12 and 86% of children age 13-17. More children lived with their mother (68%) than with their father (13%). Mothers (13%) and fathers (19%) were often non-resident members of the household.

Table 2 shows the level of mortality experience in the residency episodes. Both mothers (2.8%) and fathers (2.7%) died during the episodes. More mothers (1.6%) than fathers (0.9%) died of AIDS. Close to one per cent of mothers and a half percent of fathers died of other causes.

Data on household mortality and other characteristics is also shown in these tables. The mean number of deaths was 0.38, range 0-5. Deaths to AIDS (mean=0.12) and violence or accidents (mean=0.14) were also recorded. Households recorded a mean asset index of 7.85, range 0-21. About 5% of household had migrated previously since 1/1/2000. The number of adults in the households ranged from 0-33, with mean 4.43. The number of older persons had a mean of 0.55, range 0-5. The number of children in the households ranged from 0-25, with a mean of 5.5.

Table 2 also shows descriptive statistics on residency episodes. About 21% of the children had a move during an episode. Most of these moves were as an individual (17%) rather than with other members or as part of a household migration. More children moved out of the area (12.4%), than within the area (8.8%). About 2.4% of the children died, while 75.9 percent remained resident within the household. Multivariate analysis.

Table 3 shows a series of models for child mobility. A hazard ratio of one indicates no difference in mobility. A hazard ratio greater than one indicates increased mobility. A hazard ratio less than one indicates reduced mobility.

Model (1) includes measures of demographics and indicators of family ties and parental mortality. The youngest children (age 0-2) had the highest probability of a move (hazard ratio = 1.50, 95%CI

1.41,1.60). The other three age groups were not significantly different from each other. Males were less likely to move than females (hazard ratio = 0.92, 95%CI 0.88,0.96).

The parents' relationship to the household had a significant effect on mobility. Mobility hazards were higher if the mother (hazard ratio=1.37, 95% CI 1.18,1.59) or the father was alive at the start of observation (hazard ratio 1.10, 95% CI 0.99,1.21). The child's mobility was reduced if the mother (hazard ratio = 0.56, 95%CI=0.52,0.60) or the father (hazard ratio=0.69, 95%CI 0.62,0.76) was a resident member of the same household. Mobility was also reduced if the mother was a non-resident member (hazard ratio=0.81, 95%CI 0.73,0.90) or the father was a non-resident member (hazard ratio = 0.66, 95%CI 0.59,0.74).

The mortality experience of the parents increased mobility. If the mother died (hazard ratio = 1.23, 95%CI 1.03,1.48) or the father died (hazard ratio = 1.25, 95%CI 0.99,1.57) then the child was more likely to move.

Model (2) is the same model with dummy variables showing whether the parents died form AIDS or from other causes. Mortality due to AIDS did <u>not</u> increase mobility. However, mortality due to other causes increased mobility. If the mother died from another cause (hazard ratio=1.66, 95%CI=1.12,2.48) or the father died form another cause (hazard ratio =1.36, 95%CI 0.95,1.95), the child was more likely to move.

Model (3) adds household characteristics and household mortality experience to the model. Household assets were not related to mobility . The number of adults increased mobility (hazard ratio = 1.04, 95% CI 1.01,1.08), while the number of children reduced mobility (hazard ratio = 0.95, 95% CI 0.92,0.97). The number of older persons was not related to mobility. If the household had migrated previously, the child was much more likely to move (hazard ratio = 5.37, 95% CI 4.44,6.50). Finally, the number of deaths in the household increased the mobility of the child (hazard ratio = 1.13, 95% CI 1.02,1.25).

The final model (4) adds cause specific household mortality to the model. The number of AIDS deaths was not related to mobility, but the number of deaths due to violence or accidents increased the mobility of the child (hazard ratio = 1.89, 95% CI 1.19,2.99). The influence of the mother's mortality experience was increased in this model, compared to model (3).

Summary and Discussion.

Using data from a demographic surveillance system in KwaZulu-Natal, we have examined factors related to mobility of children. Demographic variables (age and gender), kinship ties (parents' relationship to the household), the mortality of the parents, the demographic composition of the household, and household mortality all influence child mobility.   Mortality from causes other than AIDS was more likely to result in the move of a child than was AIDS mortality.

A difference in results was associated with the cause of death of the parents.   Of the 860 deaths to mothers, 67% were due to AIDS or tuberculosis and AIDS.   Other common causes of death (>2%) for mothers were cardiac arrest (2.8%), CVA (2.6%), and traffic accidents (2.3%). Of the 763 deaths to fathers, 50% were due to AIDS or AIDS and tuberculosis.   Other common causes of death (>2%) were acute abdominal problems (3.4%), cardiac arrest (3.5%), CVA (5.5%), homicide (9.7%), liver cirrhosis (2.6%), tuberculosis (3.9%), and traffic accidents.

There is usually a long period of illness before a person dies of AIDS.   Because of this, households may have time and the necessity to find alternative options for the care of the adult's children.   Indeed, the migration of the AIDS orphan may have occurred before the residence that we observe begins. In contract, the suddenness of the death due to many of the other main causes of death (traffic accidents, homicide, cardiac arrest) may lead to a move for a child because no forward planning could be made to care for the child within the household. In addition, the circumstances that may have already occurred before the death may mean that the household is less resilient to the shock.   I

The presence of maternal and paternal kinship ties to the household was protective against migration for the child.   It is interesting that the paternal ties as well as the maternal ties are protective, given the low marriage rates of couples and the low cohabitation rates of fathers with children.

Households with more adults and children were also protective against migration. The human resources may make it easier for these households to care for children.

Although we did not find that AIDS deaths increase mobility, given the increasing size of the orphan problem, it is important to continue to assess the welfare of the children in these communities.   It is not clear whether these children did not move or if they moved at some point before the death.   Other analyses of these data show increased mortality risks for children of all ages whose parents have died from

AIDS (Ford & Hosegood, 2004).   Additional data collection in the DSA is needed to include more information on the welfare of children in the area including identification of caregivers as well as other measures of well being including the progress in school, nutrition, housing and sources of social support.

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Table 1. Demographic characteristics of children age 0-17 from residency episodes, *1/1/2000-12/31/2002*.

	Total	Male	Female
N	41,855	20,774	21,081
Mother alive at residency start	94.9%	94.8%	95.0%
Father alive at residency start	87.8%	87.7%	87.8 %
At least one parent alive at	98.1%	98.1%	98.0%
residency start			
Child's Age at residency start			
0-2	23.4%	23.5%	23.3%
3-6	20.7%	20.7%	20.7%
7-12	30.8%	31.0%	30.7%
13-17	25.0%	24.8%	25.2%
Child in school full time			
Age 7-12	97.8%	97.3%	98.3%
Age 13-17	86.0%	88.6%	83.4%
Living arrangement at start			
of observation if mother alive			
%Living with mother	68.1%	67.8%	68.4%
%Mother nonresident member			
of household	13.2%	13.5%	13.2%
%Other			
Living arrangement at start			
of observation if father alive			
% Living with father	27.0%	27.7%	26.4%
%Father nonresident member			
of household	19.5%	19.6%	19.5%
%Other			

Table 2. AIDS mortality, migration, and household characteristics from residency episodes 1/1/2000-1231/2002.

% Moved	21.2%
% Moved as an individual	17.7%
% Moved within the DSS Area	8.8%
%Moved out of the DSS area	12.44%
% Child died	2.42%
%Child remained in household	75.9%
Missing/Other	0.5%
Parental mortality	
Mother died	2.8%
Father died	2.7%
Mother died of AIDS	1.6%
Father died of AIDS	0.9%
Mother died of other known cause	0.9%
Father died of other known cause	0.5%
Household mortality	
Number of deaths	Mean = 0.38, Range =0-5
Mean number of deaths due to AIDS	Mean=0.12, Range=0-4
Mean number of deaths due to violence, persons 15 or more	Mean=0.14, Range=0-2
Household characteristics	
Mean Asset index	Mean=7.85, Range=0-21
Migrated before	5.4%
Number of adults	Mean=4.43, Range=0-33
Number of older persons	Mean=0.52, Range=0-5
Number of children	Mean=5.55, Range=0-25

Table 3. Hazard model for child mobility

Demographics and kinship ties	(1)	(2)	(3)	(4)
	Hazard ratio (95% CI) p	Hazard ratio (95%CI.)p	Hazard ratio (95%CI)p	Hazard ratio (95%ci.)p
Age				
0-2	1.50 (1.41,1.60) 0.00	1.50 (1.41,1.60) 0.00	1.53 (1.43,1.64) 0.00	1.53 (1.43,1.64) 0.00
3-6	-------	-------	-----	------
7-12	0.96 (0.90,1.02) 0.16	0.96 (0.90,1.02) 0.17	0.97 (0.91,1.04) 0.45	0.98 (0.92,1.04) 0.45
13-17	1.05 (0.98,1.12) 0.15	1.05 (0.98,1.12) 0.16	1.05 (0.98,1.12) 0.17	1.05 (0.98,1.13) 0.16
Gender				
Male	0.92 (.88,.96) 0.00	0.92 (0.88,0.96) 0.00	0.92 (0.88,0.97) 0.00	0.92 (0.88,0.97) 0.00
Female	--------	--------	-----------	--------------
Mother alive at start	1.37 (1.18,1.59) 0.00	1.37 (1.18,1.59) 0.00	1.39 (1.18,1.64) 0.00	1.38 (1/17,1.62) 0.00
Mother resident member	0.56 (0.52,0.60) 0.00	0.56 (0.52,0.60) 0.00	0.54 (0.50,0.59) 0.00	0.54 (0.50,0.59) 0.00
Mother nonresident member	0.81 (0.73,0.90) 0.00	0.81 (0.73,0.91) 0.00	0.77 (0.68,0.87) 0.00	0.77 (0.68,0.87) 0.00
Father alive at start	1.10 (0.99,1.21) 0.06	1.10 (1.00,1,21) 0.06	1.09 (0.98,1.22) 0.09	1.10 (0.98,1.22) 0.08
Father resident member	0.69 (0.62,0.76) 0.00	0.69 (0.63,0.76) 0.00	0.70 (0.63,0.78) 0.00	0.69 (0.62,0.77) 0.00
Father nonresident member	0.66 (0.59,0.74) 0.00	0.66 (0.59,0.74) 0.00	0.70 (0.63,0.80) 0.00	0.70 (0.62,0.78) 0.00
Parental mortality				
Mother died	1.23 (1.03,1.48) 0.02		1.11 (0.91,1.36) 0.29	1.24 (1.02,1.51) 0.03
Mother died AIDS	------------	1.16 (0.90,1.50) 0.25		
Mother died other causes	------------	1.66 (1.12,2.48) 0.01		
Father died	1.25 (0.99,1.57) 0.06		1.10 (0.86,1.41) 0.46	1.17 (0.91,1.49) 0.21
Father died AIDS	------------	1.20 (0.80,1.79) 0.39		
Father dies other causes	------------	1.36 (0.95,1.95) 0.10		
Household characteristics				
Asset index			0.99 (0.97,1.00) 0.12	0.99 (0.97,1.00) 0.10
Number of adults			1.04 (1.01,1.08) 0.01	1.04 (1.01,1.08) 0.01
Number of children			0.95 (0.92,0.97) 0.00	0.95 (0.93,0.98) 0.00
Number of older persons			0.96 (0.88,1.04) 0.34	0.97 (0.90,1.06) 0.55
Migrated previously			5.37 (4.44,6.50) 0.00	5.38 (4.44,6.51) 0.00
Household mortality				
Number of deaths			1.13(1.02,1.25) 0.02	
Number of AIDS deaths				1.03 (0.87,1.21) 0.74
Number of deaths due to violence				1.89 (1.19,2.99) 0.00
Accidents age 15 or more				
Number of observations	39,601	39,601	35,265	35,265
Number of subjects	39,163	39,163	34.950	34,950
Wald chi-square (p)	646.58 (.00)	647.02 (.00)	986.48(.00)	1006.25 (.00)

Figure 1. Location of Hlabisa within South Africa

Location of Hlabisa within South Africa