HIV/AIDS and Poverty: Evidence from a Household Impact Study conducted in the Free State province, South Africa[1]

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ABSTRACT

Poverty is likely to deepen as the AIDS epidemic takes its course, with households being caught up in a vicious cycle of poverty and HIV/AIDS. This paper shows that affected households are poorer than non-affected households, regardless of whether income is measured at the household, per capita or adult equivalent level and regardless of the poverty line or poverty measure employed in measuring poverty. The incidence, depth and severity of poverty are worse amongst affected households, particularly amongst affected households that have experienced illness or death, with these households being more likely to experience transitory poverty. The strongest single predictor of poverty status is access to medical aid, which hints at the importance of employment and education in explaining differences in socio-economic status. The results suggest that it is not only conventional determinants of poverty, such as employment and education, but also HIV/AIDS-related determinants of poverty, in particular morbidity, that explain why certain households are poor and others not. The evidence underscores the importance in the longer term of economic policies focused on job creation and education in mitigating the impact of HIV/AIDS, with poverty alleviation through an enhanced social safety net being important in the short to medium-term.

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1. INTRODUCTION

The HIV/AIDS epidemic poses a severe threat to the economies of developing countries, and those on the African continent in particular. South Africa, which is being affected fundamentally by the epidemic, is no exception. By the end of 1997, an estimated 2.8 million adults in South Africa were living with HIV/AIDS. By 2001, this figure had increased to 4.7 million. The estimated prevalence of HIV/AIDS among the country's adult population (20.1%) is amongst the highest in the world (ILO, 2000; UNAIDS, 2002). According to the Metropolitan-Doyle model, the annual number of AIDS deaths is estimated to increase from 120 000 to between 545 and 635 thousand between 2000 and 2010. The number of children younger than fifteen years orphaned by AIDS has been estimated to be 800 000 by 2005, rising to more than 1.95 million by 2010 (Abt Associates, 2000: 8-11).

These infected individuals and affected children all belong to individual households (meaning that an even larger number of people are affected by the epidemic in some way) and their deaths will have a significant impact on their families. Poverty, moreover, is likely to deepen as the epidemic takes its course. The socio-economic impact of HIV/AIDS combine to create a vicious cycle of poverty and HIV/AIDS in which affected households are caught up. As adult members of the household become ill and are forced to give up their jobs, household income will fall. To cope with the change in income 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 also comes under threat. Consequently, the opportunities for children for their physical and mental development are impaired. This acts to further reduce the resistance of household members and children (particularly those that may also be infected) to opportunistic infections, given lower levels of immunity and knowledge, which in turn leads to increased mortality (World Bank, 1998; Bonnel, 2000: 5-6; Wekesa, 2000). Households headed by AIDS widows are also particularly vulnerable, because women have limited economic opportunities and traditional norms and customs may see them severed from their extended family and denied access to an inheritance (UNDP, 1998). Worrying, more, is that firms are increasingly using contract labor rather than appointing employees on a permanent basis, which

increasingly shifts the burden of HIV/AIDS onto households and government (Rosen and Simon, 2002). This also means that HIV/AIDS-affected households (and in particular infected persons) may find it increasingly difficult to find employment and remain in employment, which is crucial for ensuring some kind of economic security at the household level. In many third world situations, therefore, HIV/AIDS exposes already vulnerable, resource-poor households to further shocks.

These are all ways in which HIV/AIDS can cause poverty to increase. Whiteside (2001/02) describes the above linkages between HIV/AIDS and poverty in considerably more detail, but then goes on to point out that poverty can also result in increased vulnerability to HIV/AIDS, which in turn can aid the spread of the disease. Poverty, apart from being associated with poor nutrition and a breakdown of immune systems, also stand to increase the vulnerability of people to HIV/AIDS by resulting amongst others in unsafe sexual practices as a result of lack of knowledge and lack of access to means of protection, due to women's inability to negotiate about condom use with sexual partners as a result of entrenched gender roles and power relations, and because of violence and coercion (Whiteside, 2001/02). In fact, both Desmond (2001) and Whiteside (2002) emphasize how complex the relationship between poverty and HIV/AIDS actually is and how many facets it has, e.g. how labor migration induced by rural poverty can contribute to the spread of the disease and how poor, single mothers may be forced to become occasional sex workers in order to survive (Desmond, 2001: 56; Poku, 2001: 195). Gillies *et al.* (1996) and Nyamathi *et al.* (1996), moreover, highlight the importance of homelessness, urban/rural migration patterns, migrant labor practices and the breakdown of social support networks in communities with limited access to social service delivery and in developing countries in increasing the vulnerability of poor people to HIV/AIDS. This paper deals primarily with the question of the extent to which HIV/AIDS (via increased morbidity and mortality, as well as other HIV/AIDS-related impacts) can cause poverty to increase.

2. DATA AND METHOD

The impact of HIV/AIDS on households was assessed by means of a cohort study of households affected by the disease, and compared with a control group of households not currently affected by the disease. The survey was conducted in two local

communities in the Free State province, one urban (Welkom) and one rural (QwaQwa), in which the HIV/AIDS epidemic is particularly rife. Affected households were sampled purposively via NGOs and other organizations involved in AIDS counseling and care and include at least one person known to be HIV-positive or known to have died from AIDS in the past six months. Informed consent was obtained from the infected individual(s) or their caregivers (in the case of minors). Non-affected households represent households living in close proximity to these affected households, but which did not at the time of the first interview include persons suffering from chronic HIV/AIDS-related diseases such as tuberculosis or pneumonia. Households were defined in terms of the standard definition employed by Statistics South Africa in the October Household Survey, 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 organization of the household, including household finances". The results reported in this paper are based an analysis of the data for the 387 households that were interviewed in both wave I and in II of this study. The two waves of data collection were respectively completed in May/June and November/December 2001.

Although the sample population in certain instances closely reflects the socioeconomic profile of the national population (e.g. male/female distribution), it in most cases differs distinctly from the general South African population (Booysen *et al*., 2002). The profile of the sample of households included in this study can largely be attributed to the sampling design. Given that affected households were sampled from networks and/or organizations involved in counseling, home-based care and public health care and mainly in poorer communities, the sample does not include affected households that mainly utilize private health care services. Moreover, the study was conducted in one specific province (Free State) and in two selected sites only. However, the fact that South Africa's poor, predominantly African population face relatively high HIV prevalence rates and are particularly vulnerable to the epidemic and therefore dependent on support from the public service sphere, means that the findings and policy recommendations put forward in this paper are especially relevant to informing government's responses to HIV/AIDS.

3. DISCUSSION

3.1 Measurement of standard of living

Poverty (or standard of living) is 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: 2553-2567). The concern, therefore, is with 'poverty proper' (i.e. resource adequacy) and not with the physiological, sociological or political dimensions of poverty (Kgarimetsa, 1992: 8; Woolard and Leibbrandt, 1999: 3).

Generally, a single monetary indicator, such as income or consumption, is employed in assessing the extent of poverty and inequality (Ravallion, 1996: 1328-1334). Income is argued to reflect consumption opportunities and is therefore a popular measure of poverty (Hagenaars, 1991: 135-146). During the survey, data were collected from one informant regarding the employment income, non-employment income 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. Consumption represents an alternative resource base for measuring poverty and inequality (Lipton, 1997: 1003). During the survey, fieldworkers collected expenditure-related data from the household member in charge of household finances in each of these households. This include estimates of household expenditure on specific items such as food, education, health care, transport, monthly repayments of debt, and clothing, as well as remittances made to persons not living with the household. As in the case of income, an estimate of total monthly household expenditure was calculated by adding these items together.

Income, however, in a certain sense represents an inadequate measure of poverty. So, for example, it is generally assumed that household income is employed in a manner that benefits the whole family. Yet, this may not necessarily be the case, given inequalities and inequities in the intra-household allocation of resources (Woolley and Marshall, 1994: 422-429). Furthermore, levels of income and consumption often differ as a result of consumption smoothing. Consumption also represents a better proxy of current living standards and long-term average well being than income for other reasons. Consumption bridges the observed disparity between

income and expenditure levels. Expenditure also reveals information about both past and future incomes, because it includes consumption financed from savings (Lipton and Ravallion, 1995: 2573).

The income-based estimates of household welfare in the case of this study exceed the expenditure-based estimates. Normally, one would expect the opposite, with expenditure-based estimates exceeding income-based estimates of household welfare. This may be because the one informant that was interviewed (i.e. the person in charge of household finances) generally has a better idea of the employment status and average earnings of other members of the household (in fact, the person during the interview often verified this information with other household members). This person, moreover, is unlikely to be knowledgeable about the manner in which each member of the household spends their income. In fact, individuals and/or households have been found to rarely record expenditure data in detail (Woolard and Leibbrandt, 1999: 23-24). Expenditure, therefore, in this case most likely reflects only that amount of resources of household members that is spent on communal household needs.

The literature, moreover, suggests that HIV/AIDS can impact on household income and expenditure in different ways. On the one hand, the changes in the supply of household labor caused by AIDS morbidity and mortality are likely to be accompanied by a drop in household income. On the other hand, household expenditure may increase initially following illness or death, given that households need to spend more on medical care and funerals. In the Kagera study, for example, the total level of expenditure was 25 percent higher in households suffering an adult death than in household where no adult death occurred (Lundberg and Over, 2000). In the case of rural Thailand, though, per capita expenditure in households affected by an adult death on average dropped by 43.5 percent (Kongsin *et al.*, 2000, as quoted in Parker *et al.*, 2000: 44). As a result, the income-based estimates are likely to represent a more reliable measure of the standard of living of these households and are likely to be a better proxy of the impact of HIV/AIDS on household welfare, which means that this paper employs household income as proxy of standard of living rather than household expenditure.

Households with the same level of income do not necessarily enjoy the same level of welfare. The larger the household, the lower the level of welfare at similar levels of household income. Measures of equivalent income are employed to allow for these differences in standard of living related to household characteristics (Lipton and

Ravallion, 1995: 2574; Burkhauser *et al.*, 1997: 154-161). Estimates of household income were here adjusted for differences in household size by dividing total monthly income by n^{α}, where n represents the number of household members and α an adjustment for household economies of scale (Filmer and Pritchett, 1998: 13). According to Lanjouw and Ravallion (1995) and Drèze and Sen (1997), a α coefficient of 0.6 represents an adequately robust and reliable adjustment for household economies of scale.

3.2 Comparisons of levels of household income

Table 1 report on the average adult equivalent per capita household income of affected and non-affected households. A distinction is also made between affected households that have experienced illness (i.e. a member of the household has been chronically ill in the thirty days preceding the interview) or death (i.e. a member of the household has died in the six months preceding the first interview or in the time elapsed following the first interview) and those that has not been affected by morbidity or mortality.

Table 1: Average Adult Equivalent Per Capita Income for Affected and Non-affected Households

	Total sample	**Affected households**	**Non-affected households**	**Affected households suffering illness/death**	**Affected households suffering no illness/death**	**Non-affected households suffering illness/death**	**Non-affected households suffering no illness/death**
Wave I	715.76	509.83	916.29	449.37	798.88	694.92	971.62
Sample (n)	*375*	*185*	*190*	*153*	*132*	*38*	*152*
Wave II	623.84	470.69	772.94	410.66	766.94	660.20	799.47
Sample (n)	*373*	*184*	*189*	*120*	*64*	*32*	*157*

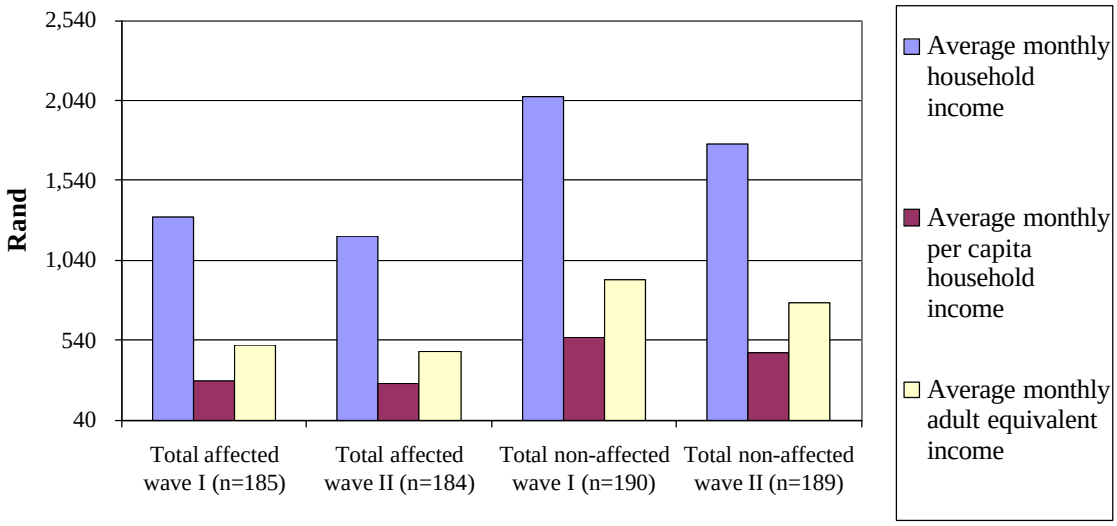
Note: The reported sample sizes reflect those of the total 387 households interviewed in both waves that actually reported an income.

The loss of labor supply brought about by AIDS will cause household income to decline (Topouzis, 2000). Consequently, affected households (and in particular ones affected by morbidity or mortality) should be poorer than non-affected households. This fact is born out in the results presented in Table 1 and Figure 1. Adult equivalent per capita income in affected households represents only between 50% and 60% of the levels of income in non-affected households (Table 1), as is the case with total household income and per capita household income (Figure 1). The comparison of the

two groups of affected households (these households all include someone known to be HIV/AIDS positive) presents even clearer evidence of the likely effect of HIV/AIDS on household welfare. The adult equivalent per capita income of affected households that has experienced illness or death is substantially lower than is the case in affected households that has not suffered illness or death (Table 1). This is also the case where non-affected households that have experienced illness or death are compared with ones that have not, thus illustrating how illness and death in general impacts on household welfare even where it is not necessarily related to HIV/AIDS (i.e. testing was not conducted and non-affected households were only screened for the presence of certain chronic illnesses in wave I).

Also evident from Table 1 is that income has declined between the two waves, both in the case of affected and non-affected households as well as in the total sample. These differences in some cases are relatively small, but may be pointing towards a general decline in levels of income. However, it is felt that more panels are required to determine real trends in household income and therefore to substantiate the findings reported here, particularly insofar as income is measured off a relatively low base in this case (i.e. the study population generally is quite poor), which makes it difficult to distinguish between real trends and small differences in income, particularly also in the context of problems of measurement error.

Figure 1: Average household income in wave I and II



Note: The reported sample sizes reflect those of the total 387 households interviewed in both waves that actually reported an income.

The available evidence from other household impact studies supports the above findings, i.e. that households affected by HIV/AIDS generally are poorer than non-affected households. Only one study reports on the impact of AIDS morbidity on household income. Households living in rural Chanyanya in the Kafue district in Zambia that were affected by chronic illness had an annual income 46 per cent lower than households in the same area that were not affected by chronic illness (Mutangadura and Webb, 1999, as quoted in Topouzis, 2000: 18). A number of studies have reported on the effect of AIDS mortality on household income. So, for example, households in Zambia that have suffered a paternal death have experienced a drop in monthly disposable income in excess of 80 percent (Nampanya-Serpell, 2000). Households in rural Thailand affected by an adult death saw household income drop by 70.7 per cent, while total per capita income dropped by 68.4 percent (Kongsin *et al*., 2000, as quoted in Parker *et al*., 2000: 44). A study in the Ivory Coast, which fails to indicate whether the focus in on AIDS morbidity or mortality, reported that the household income of affected families was found to be half that of total average household income (Bechu, 1998, as quoted in Desmond *et al*., 2000: 5).

3.3 Comparisons of incidence, depth and severity of poverty

Apart from describing differences between affected and non-affected households in terms of general levels of welfare (or household income in this case), one would also want to determine how poverty differs between affected and non-affected households. To estimate poverty one requires a poverty line, i.e. a level of income below which people are considered poor. Poverty lines provide a yardstick with which to compare the circumstances of individual households. Aggregate measures of poverty cannot be estimated without a poverty line. Armed with the estimate of household income and the poverty line estimate, one can aggregate this information into a variety of descriptive measures of poverty and inequality (Grootaert, 1983: 3-10). The following specific measures of poverty and inequality are employed in this analysis.[2]

[2] The estimates of the measures of poverty and inequality that are presented in these pages were calculated with the aid of the POVCAL program developed by the World Bank. POVCAL is an easy to use and reliable tool for routine poverty assessment work. It uses sound and accurate methods for calculating poverty and inequality measures with only a basic PC and any of the various types of grouped distribution data typically available, often in published form. POVCAL estimates a General Quadratic Lorenz curve and Beta Lorenz curve for each data set and then performs a range of tests to assess the validity of each of the Lorenz curves. The measures of poverty and inequality reported in

The *Gini coefficient* (G) represents the average ratio between the proportion of total income actually earned by a specific household and the proportion of income the household would have earned had income been distributed equally. G = 0 denotes total equality and G = 1 total inequality (Paukert, 1973). Because inequality is an important determinant of poverty, an analysis of the extent of income inequality can provide an important pointer to determining whether poverty is more severe amongst affected than non-affected households. If inequality is more pronounced amongst affected households, one would expect that more affected households fall below the poverty line. This in turn will mean that poverty is more prevalent amongst affected households, which can be determined by comparing the estimates of the following poverty indices across affected and non-affected households.

The *headcount poverty index* (H) is a measure of the prevalence or incidence of poverty, i.e. the percentage of the population with a level of income below the poverty line (z). H = q/n, where q represents the number of poor persons falling below the poverty line z and n the total population (Ravallion, 1992/94a/94b; Lipton and Ravallion, 1995). The *poverty gap index* (PG) is a measure of the intensity or depth of poverty that allows for how far the poor fall below the poverty line. The index is calculated as each individual's shortfall below the poverty line (z) summed over the total population. It considers the non-poor to have a zero poverty gap. $PG = 1/n \Sigma [(z-y_1)/z] = H (1-\mu/z)$, where H represents the headcount poverty index, μ mean expenditure or income, and z the poverty line (Ravallion, 1992/94a/94b; Ravallion and Bidani, 1994; Lipton; 1997). The *squared poverty gap index* (SPG) represents a measure of the severity of poverty that allows for the extent of inequality amongst the poor. The SPG attaches more weight to those gains furthest from the poverty line. The index is calculated as the mean of the squared proportional poverty gaps over the entire population with the non-poor again counted as having a zero poverty gap. $SPG = 1/n \Sigma[(z-y_1)/z]^2 = PG^2/H + (H-PG)^2 / H*CV_p^2$, where H and PG respectively represent the headcount and poverty gap indexes, while CV_p^2 is the squared

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these pages are based on the General Quadratic Lorenz curves estimated from the tabulated data. The General Quadratic Lorenz curves were invalid only in select cases and then only at the upper extremes of the income distribution, whereas the Beta curves were invalid in most cases. The sum of the squared standard errors over these Lorenz curve were generally extremely small.

coefficient of variation of income or consumption amongst the poor (Ravallion, 1994a/94b; Ravallion and Bidani, 1994; Lipton and Ravallion, 1995; Lipton, 1997).[3]

Table 2: Estimates of the Headcount Poverty Index (H), Poverty Gap Measure (PG), Squared Poverty Gap Index (SPG) and Gini-coefficient for Affected and Non-affected Households

	Total sample	Affected households	Non-affected households	Affected households suffering illness/death	Affected households suffering no illness/death	Non-affected households suffering illness/death	Non-affected households suffering no illness/death
A. Wave I							
H	36.99	44.74	29.55	48.85	26.11	34.44	27.98
PG	16.32	19.75	13.14	20.93	15.71	15.56	12.44
SPG	9.20	11.21	7.55	11.44	13.27	9.16	7.15
Gini	59.90	56.50	59.60	54.44	60.08	57.91	59.35
Sample (n)	*375*	*185*	*190*	*153*	*132*	*38*	*152*
B. Wave II							
H	51.03	57.27	44.37	55.63	41.72	46.38	43.24
PG	24.24	27.22	20.67	24.34	20.13	20.02	20.34
SPG	14.55	16.39	12.28	13.82	12.59	11.08	12.23
Gini	69.85	65.33	71.36	58.11	70.25	68.25	71.56
Sample (n)	*373*	*184*	*189*	*120*	*64*	*32*	*157*

Note: The reported sample sizes reflect those of the total 387 households interviewed in both waves that actually reported an income.

The Gini coefficients and poverty indices calculated for each of the groups of affected and non-affected households are reported in Table 2. The results are here reported only for the poverty line of R250 adult equivalent per capita income, which was employed in the most recent poverty estimates published by Statistics South Africa (2000: 11), albeit not in adult equivalent form. Evident from the results in Table 2 is that the degree of inequality is slightly higher amongst non-affected households than amongst affected households. These differences in the extent of income inequality are even more pronounced in the case of the comparison between the two groups of affected households, i.e. those having experienced illness or death and those not having experienced illness or death, while it also holds for the comparison across the two groups of non-affected households. This may be the result of households experiencing illness or death being more likely to have a lower income, which

[3] The headcount, poverty gap and squared poverty gap indices are special cases of the Foster-Greer-Thorbecke (FGT) class of poverty measures. $P_\alpha = 1/n\Sigma[z-y_i/z]^\alpha$, where z represents the poverty line and y_i the actual income or consumption level of each person or household. The three FGT measures each focus on a different conventional poverty measure. P_0, P_1 and P_2 respectively are derivatives of the headcount (H), poverty gap (PG) and squared poverty gap (SPG) indices (Greer and Thorbecke, 1986). As explained above, these poverty measures become more sensitive to the well-being of the poorest person as the value of α increases (Woolard and Leibbrandt, 1999: 28).

translates into relatively lower levels of income and relatively less variation in income (at least across the higher ranges), which in turn means that the extent of income inequality is likely to be less pronounced. In the case of non-affected households, variation in household income is more pronounced, translating into higher levels of income inequality. Interesting, furthermore, is that inequality has increased between wave I and wave II of the study, this being the case in all subgroups of affected and non-affected households, as well as in the total sample population. As explained elsewhere, more panels are required to determine real trends in income and therefore in the extent of income inequality.

According to the results presented in Table 2, the incidence, depth and severity of poverty are worse amongst affected households than amongst non-affected households. This is also the case when comparing the estimates of the incidence and depth of poverty across affected and non-affected household that have experienced illness or death as opposed to affected and non-affected households that have as yet not experienced illness or death. According to these estimates, poor, affected households will have to boost their income by nearly twenty (wave I) and twenty-eight per cent (wave II) to reach the poverty line. Non-affected households in turn only have to boost their income by approximately thirteen (wave I) and twenty-one per cent (wave II) to reach the same poverty line. Thus, poverty does appear to be significantly worse amongst affected households. The comparison of poverty estimates across the two rounds of interviews also seems to suggest that the incidence, depth and severity of poverty are on the increase, albeit the case for both affected and non-affected households. In fact, poverty is relatively pronounced in both these communities, with a relatively high proportion of both affected and non-affected households being classified as poor (e.g. the headcount index respectively amounts to 37 and 51 percent in wave I and wave II). According to Statistics South Africa (2000), the headcount poverty ratio in the magisterial districts of Welkom and Witsieshoek (which lies within the boundaries of the former Qwaqwa) respectively are 0.34 (this is likely to be much higher in the African communities in which this survey was conducted) and 0.69, while the estimate of average monthly household expenditure respectively amounts to R2364 (again likely to be much lower for the residents of the African and Colored townships where the survey was conducted) and R807. Again, caution is required insofar as data from more panels are required to validate such

claim and to establish trends in poverty. One may therefore tentatively conclude that poverty indeed is worse amongst affected than amongst non-affected households.

3.4 Robustness of poverty comparisons

In order to further substantiate such argument, one needs to perform a number of poverty comparisons. The main purpose with a poverty comparison is to determine whether the results of such comparison are robust and consistent. The conclusion drawn from a poverty comparison, i.e. whether affected households are poorer than non-affected households or not, should not be dependent on the choice of a particular standard of living indicator, poverty line, or poverty measure (Ravallion and Bidani, 1994: 76; Ravallion, 1994b: 44-51). The robustness of a poverty comparison is determined by comparing the headcount, poverty gap and squared poverty gap index across a critical range of poverty lines. Arbitrariness is practically unavoidable in setting poverty lines, primarily because of the multitude of methods that are employed for this purpose (Kgarimetsa, 1992: 9; Alcock, 1993: 60-62; Johnson, 1996: 110-112). Hence, the standard practice has become one of testing the robustness of poverty lines by simultaneously employing more than one such estimate in poverty analysis. Ravallion (1994b: 43) refers to this as the use of dual poverty lines. Results are compared across poverty line estimates based on different methodologies and/or alternative assumptions made using similar methods (Lipton and Ravallion, 1995: 2577; Lipton, 1997: 1003). A similar approach is followed here. The range of poverty lines used for this purpose varies from R100 to R600 in adult equivalent per capita terms, which covers all the currently available poverty line estimates for South Africa, even when allowing for the effect of inflation (Klasen, 1997: 56; Woolard and Leibbrandt, 1999: 14; Booysen, 2001: 680). Partial poverty orderings or poverty value curves are used for the purposes of presenting the results (Ravallion, 1994b: 1-3; Woolard and Leibbrandt, 1999: 12). To obtain these curves, estimates of the headcount, poverty gap and squared poverty gap indices for the subgroups of households are plotted for the critical range of poverty lines. The values of the poverty measure are plotted on the vertical axis and the cumulative values of the poverty line are plotted on the horizontal axis. A comparison is robust and consistent if the poverty value curve for one subgroup dominates and/or matches that of another subgroup across the entire range of poverty line estimates. This means that one

subgroup is poorer than another subgroup regardless of the poverty line used for comparative purposes. Only the poverty incidence dominance curves for each of the four main clusters of households are reported here (Figures 2 to 5). According to Ravallion and Sen (1996: 776), the conditions for dominance are likely to hold for the poverty gap and squared poverty gap measures if it holds for the headcount index.

Figure 2: Incidence of poverty in affected and non-affected households (wave I)

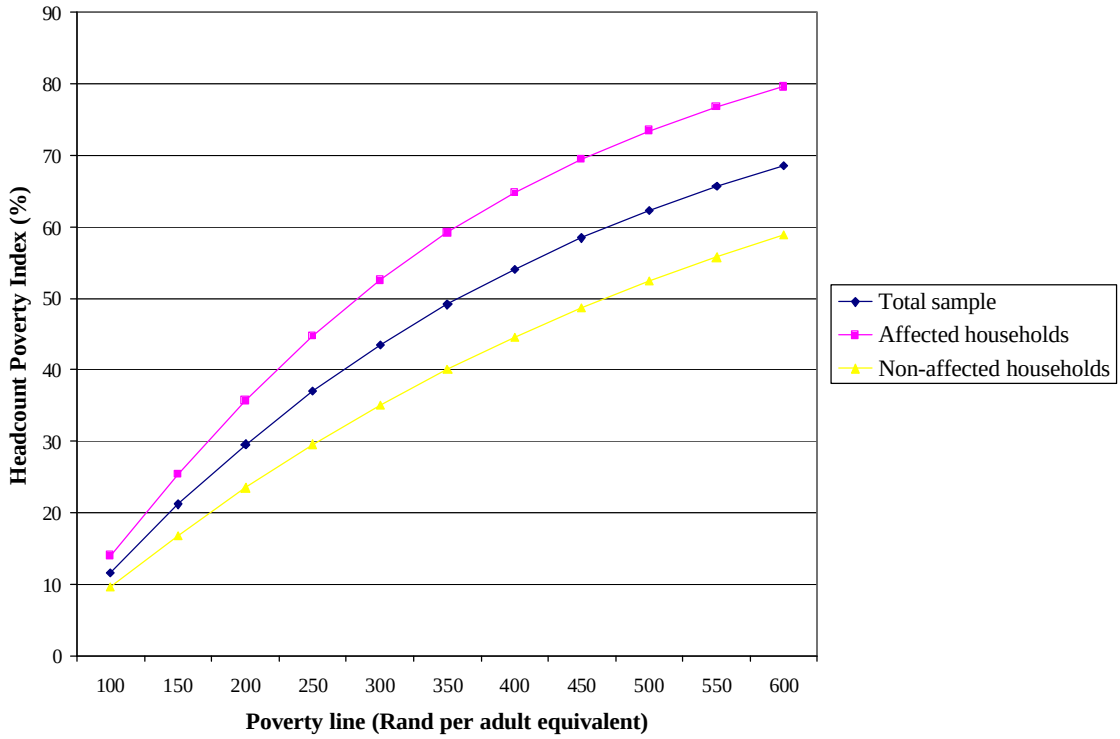
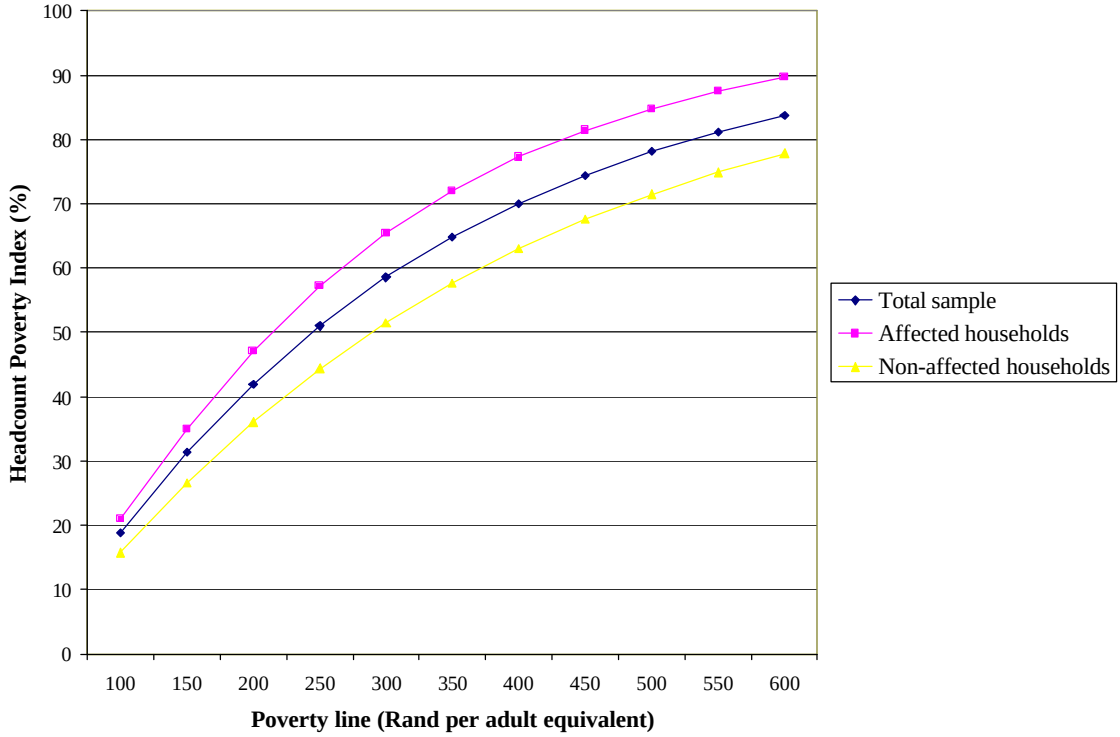


Figure 3: Incidence of poverty in affected and non-affected households (wave II)



Evident from Figures 2 and 4, is that levels of poverty are generally higher amongst affected households, regardless of the choice of poverty line. The poverty incidence curve for affected households dominates that for non-affected households across the entire range of poverty lines. Poverty, therefore, does seem to be worse amongst affected households. The fact that the socio-economic impact of AIDS is indeed worse in poorer households has been confirmed by Nampanya-Serpell (2000), while much of the analysis following from the Kagera household study has argued that household wealth and access to public services are very important in protecting households from the impact of HIV/AIDS. Impact was found to only be significantly worse in households affected by adult deaths compared to ones with no adult deaths when controlling for differences in socio-economic status (Ainsworth *et al.*, 2000; Ainsworth and Dayton, 2000; Lundberg and Over, 2000). Another test of the robustness of the findings presented here is the extent to which poverty is consistently worse amongst households that have directly experienced illness and/or death. Figures 4 and 5 represent the poverty incidence curves for affected and non-affected households by incidence of illness and/or death.

Figure 4: Incidence of poverty in affected and non-affected households by incidence of illness and/or death (wave I)

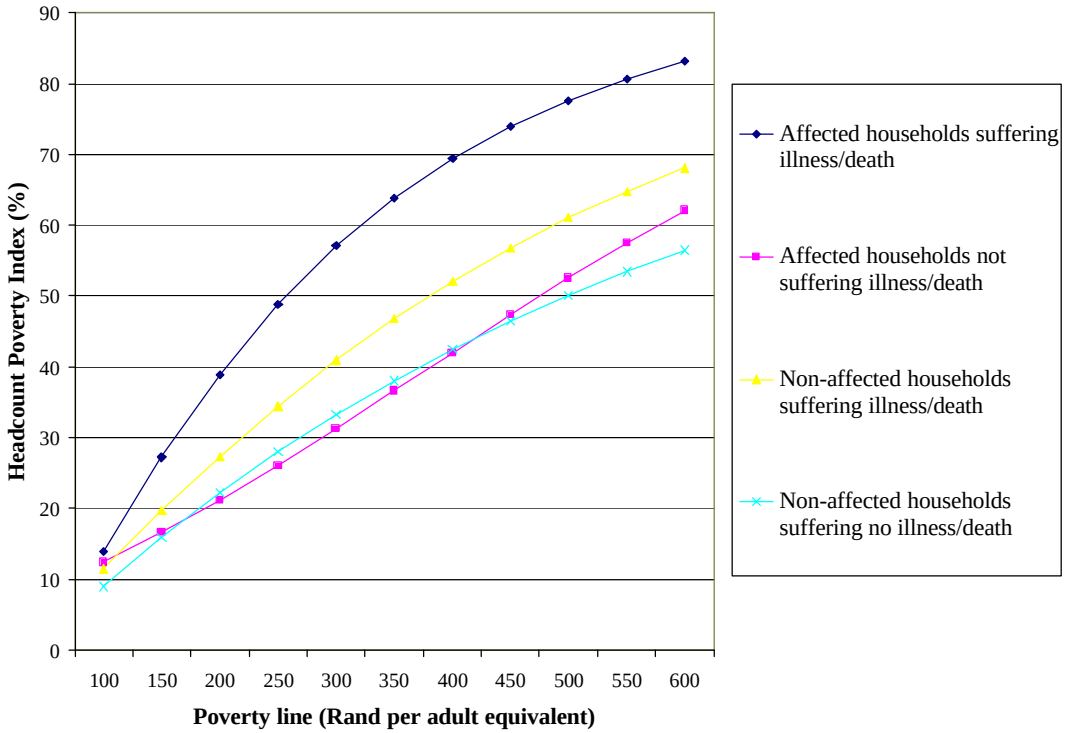
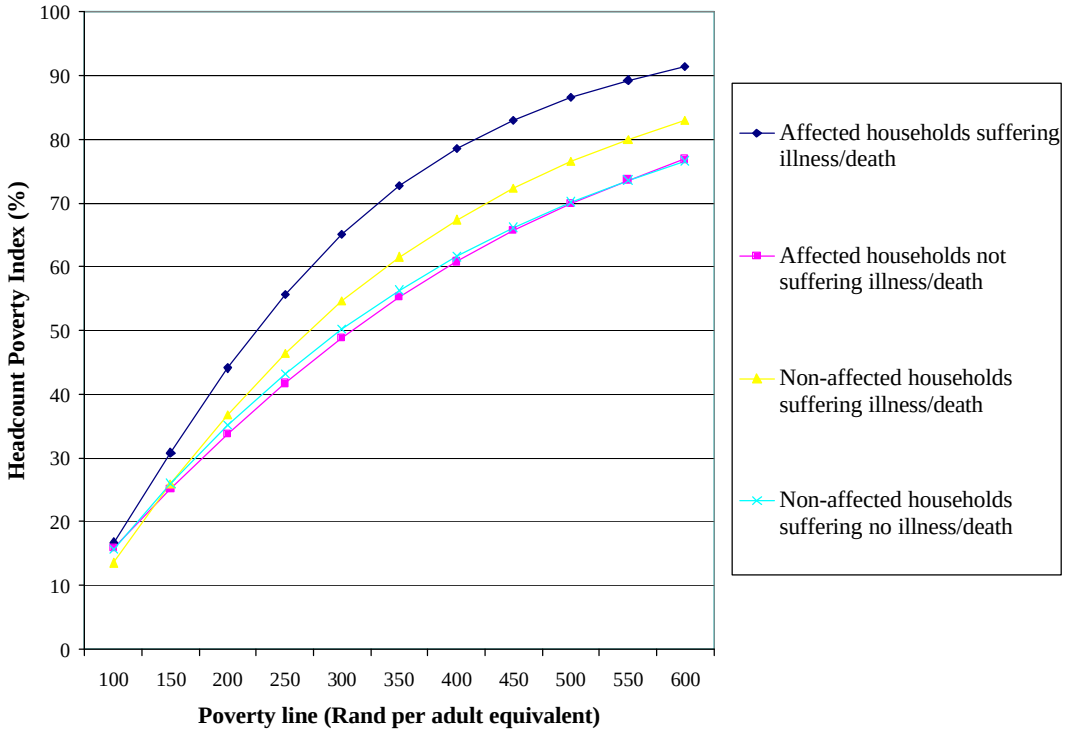


Figure 5: Incidence of poverty in affected and non-affected households by incidence of illness and/or death (wave II)



In the case of affected households (i.e. households including at least one person known to be HIV-positive), the incidence of poverty indeed is higher amongst affected households that have experienced illness and/or death than in affected households where this is not the case, regardless of the poverty line employed in quantifying the extent of poverty. Again, therefore, the evidence seems to suggest that HIV/AIDS is likely to result in poverty. In the case of non-affected households, however, the comparison is not consistently robust, with the poverty incidence curves crossing at the bottom end of the range of poverty lines in wave II (Figure 5), although being robust in wave I (Figure 4). This could be the result of these households being in a better position than affected households to cope with the resulting loss of supply of labor and household income, e.g. having access to medical aid and having other household members in employment. Yet, it may also be because of the relatively small number of non-affected households that have experienced illness and/or death ($n<40$), which makes meaningful comparisons difficult.

3.5 Poverty shares

The above analysis does not take into account how many affected households there are in comparison to non-affected households. Hence, the analysis fails to highlight the extent to which affected and non-affected households share the burden of poverty. Such analysis requires poverty measures that are additively decomposable. Additive decomposability means that overall inequality can be portioned into inequality between subgroups and within subgroups. Decomposition across space requires measures of the type $P_\alpha = n_A P_{\alpha A} + n_B P_{\alpha B}$, where A and B represent two subgroups and n_A and n_B the population shares of the two groups that the poverty estimate P_α for each group is weighted by (Lipton and Ravallion, 1995: 2580-2581). The FGT class of poverty measures is additively decomposable. This feature of the three measures of poverty employed in this analysis makes it possible to determine the share of affected and non-affected households in the poverty burden. Poverty shares were calculated separately for affected and non-affected households, as well as for affected households that have and have not experienced illness and/or death in the recent past. Poverty shares were calculated with reference to the R250 adult equivalent per capita poverty line. The evidence suggests that there is not such a great difference between

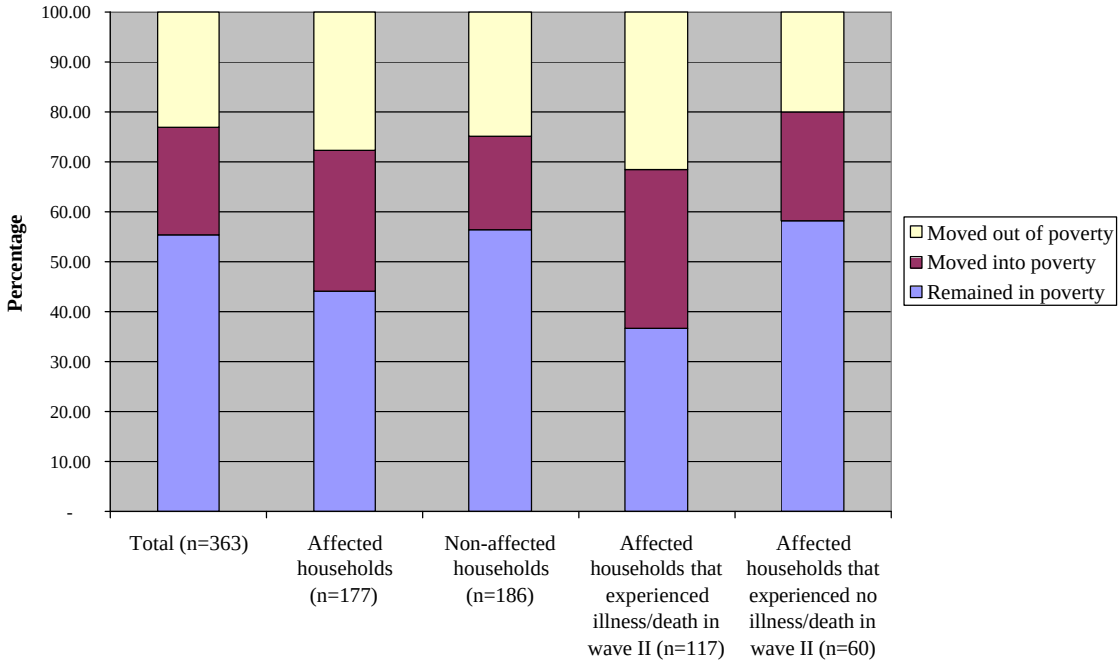
the share of poverty shouldered by affected and non-affected households, although affected households bear a larger share of the total burden of poverty, perhaps because of the fact that the two samples are almost equal in size. Affected households have born 53.1 (wave I) and 59.9 percent (wave II) of the burden of poverty, compared to the 46.9 (wave I) and 40.1 percent (wave II) born by non-affected households. However, when the poverty shares are calculated across the sub-sample of affected households only, the results underscore the extent to which affected households that have experienced illness and/or death bear the brunt of poverty compared to affected households not yet affected by illness or death. Households that have experienced illness and/or death respectively have born 71.3 (wave I) and 90 percent (wave II) of the burden of poverty on affected households. As a result, policies aimed at poverty alleviation can be argued to be particularly crucial in sustaining the livelihoods of affected households that have actually experienced illness and/or death.

3.6 Poverty transitions

Given the longitudinal design of this study, it is also possible to consider the extent to that affected and non-affected households move into and out of poverty over time, or alternatively remain in poverty. According to May and Roberts (2001: 100), this is one of the main advantages of panel studies, namely to distinguish between transitory and persistent poverty. Poverty transition matrices are particularly useful in distinguishing between the extent of transitory and persistent poverty in affected and non-affected households. A poverty transition matrix represents the proportion of households classified as poor in each of the two periods (i.e. wave I and II) relative to a particular poverty line. Households on the diagonal in the matrix have remained in poverty, whereas households to the left and right of the diagonal have respectively fallen into and moved out of poverty (May and Roberts, 2001: 106-107). The main question here is whether affected households are more likely to experience transitory and/or persistent poverty than are non-affected households. One would expect affected households (due for example to the changes in income caused by illness and/or death) to move into and out of poverty to a larger extent than non-affected households. Yet, affected households may in the longer term also experience higher levels of persistent poverty, because of the cumulative impact of the loss of household member that are economically active and the effects of increased stigmatization on

these households, which may further alienate them from existing community support structures and exclude their members from labor markets.

Figure 6: Poverty transitions between wave I and wave II



Note: The reported sample sizes reflect those of the total 387 households interviewed in both waves that actually responded to the questions on household income in both interviews.

Figure 6 reports on the percentage of households in each cluster that remained in poverty (those on the diagonal), that that moved out of poverty (those to the right of the diagonal) and those that fell into poverty (those to the left of the diagonal). Poverty status was set relative to different categories of income relative to the R250 adult equivalent per capita level. The detailed poverty matrices for these four clusters of households are reported in Appendices A to D. A distinction is made between affected (Appendix A) and non-affected households (Appendix B), as well as between affected households that respectively have experienced illness or death (Appendix C) or not (Appendix D).

Evident from Figure 6 (as was the case elsewhere) is the relative persistence (and high incidence) of poverty amongst these households. More than half of the households could be classified as poor in both wave I and wave II. The results also suggest that affected households are more likely to experience transitory poverty, which makes sense insofar as affected households are more likely to be affected by

morbidity and mortality, which in turn are associated with short-term fluctuations in household income. A larger proportion of non-affected households (i.e. 56.5 percent) remained in poverty compared to affected households (i.e. 44.1 percent). The comparison across affected households that have experienced illness or death between the two rounds of interviews and affected households that have not presents a similar picture. In this case, 36.8 percent of affected households that experienced illness or death remained in poverty, whereas 58.3 percent of households that did not experience illness or death remained in poverty. Hence, larger proportions of affected households and in particular affected households that have experienced illness or death have moved out of or into poverty, i.e. experienced transitory rather than persistent poverty. In addition, it appears as if a larger proportion of affected households and affected households that had experienced illness or death had moved into poverty than had moved out of poverty compared respectively to non-affected households and affected households that had not experienced illness or death, although a larger share had also moved out of poverty. This suggests that HIV/AIDS may be pushing households into poverty, at least in the short-term, while households are also moving out of poverty following illness or death.

It is important, therefore, to conduct further analysis to identify the particular reasons why these households have moved into and out of poverty, e.g. whether the loss in income was caused by the death of a main breadwinner or whether the increase in household income was caused by an increase in the number of employed members in the particular household. Also of importance is the relationship between these poverty transitions and the timing of the death, e.g. one would expect poverty transitions to be more pronounced (i.e. a larger number of households moving across more than one cell in the poverty matrix) the shorter the time that has elapsed between the death and the second measurement of household welfare. The regression results discussed towards the end of this paper goes some way towards answering these particular questions, although further work is required in this regard, particularly with reference to the relationship between poverty transitions and the timing of the death relative to the measurement of household welfare. However, as explained elsewhere, the above results should be interpreted with caution insofar as measurement error (which normally is relatively pronounced in the measurement of economic variables) may be important in explaining part of the variation in the classification of households as poor or non-poor in the respective waves of this panel study.

3.7 Determinants of poverty

In order to further explore the relationship between poverty and HIV/AIDS, some multiple logistic regression analyses were performed with poverty status as outcome, particularly with a view to determining those factors that act to protect households against poverty or in turn increase their vulnerability. Janjaroen (1998), for example, report that differences between affected households in adult equivalent per capita expenditure are small and are not statistically significant, except when controlling for socio-economic status and vulnerability by for example allowing for differences in education of the household, gender of the deceased and the duration of illness. One can of course perform such analyses with alternative poverty lines to test the robustness of these findings. However, due to constraints of space and time this has not been attempted in this paper. Adult equivalent per capita household income was employed as a proxy of standard of living. For the purpose of these analyses, an outcome of one indicates that a household is not poor, i.e. adult equivalent per capita household income exceeds R250, while zero indicates that a household is poor, i.e. adult equivalent per capita household income falls below the R250 level. The results are reported in Tables 3 and 4. Separate analyses were performed with the data from wave I (Table 3) and from wave II (Table 4) to determine the robustness of the results. Results are also reported separately for the affected and non-affected groups of households to identify possible differences between the determinants of poverty in these two groups of households. Included in the multiple logistic regression analyses as explanatory variables were urban/rural residence, affected/non-affected status, gender and age of the household head, the number of ill persons or recent deaths in the household, the number of orphans sheltered by the household, the total number of years of schooling of all household members, the number of employed members in the household, access to medical aid, and the household size and dependency ratio. The emphasis in the subsequent discussion falls particularly on the significant determinants of poverty that feature in both the wave I and wave II analyses.

Table 3: Predictors of household poverty status based on income: Logistical regression models (wave I)

Explanatory variables and summary statistics	Total		Affected households		Non-affected households	
	OR	**P**	**OR**	**P**	**OR**	**P**
Urban versus rural location	**0.649**	**0.097**	0.638	0.186	0.646	0.315
Male versus female head of household	0.703	0.191	**0.453**	**0.024**	1.200	0.705
Affected versus non-affected status	1.194	0.548				
Household size	**0.653**	**<0.001**	**0.769**	**0.044**	**0.503**	**0.002**
Age of head of household (by deciles)	**1.363**	**0.001**	1.107	0.407	**1.808**	**0.001**
Years of schooling (by deciles)	**1.357**	**0.031**	1.235	0.240	**1.558**	**0.085**
# employed household members	**3.134**	**<0.001**	**2.320**	**0.004**	**4.409**	**<0.001**
Access to medical aid	**26.578**	**0.002**	**11.310**	**0.028**		
Dependency ratio	**1.011**	**0.074**	1.012	0.139	1.015	0.200
# persons that are ill	0.864	0.393	0.924	0.694	0.814	0.576
# persons that have died	1.906	0.111	1.908	0.125		
# orphans in household	0.884	0.440	1.038	0.866	0.805	0.402
Sample (n)		*405*		*202*		*161*
LR chi2 (P)		*109.68 (<0.001)*		*38.29 (<0.001)*		*50.66 (<0.001)*
Pseudo R^2		*0.216*		*0.143*		*0.248*

Note: Odds ratios and P values in bold are statistically significant at the 0.10 level. In the regression model for non-affected households, "access to medical aid" (41 observations) and "# of persons that have died" (1 observation) respectively predicted success and failure perfectly and were excluded from the model.

Table 4: Predictors of household poverty status based on income: Logistical regression models (wave II)

Explanatory variables and summary statistics	Total		Affected households		Non-affected households	
	OR	**P**	**OR**	**P**	**OR**	**P**
Urban versus rural location	0.730	0.246	0.653	0.242	0.987	0.977
Male versus female head of household	**0.484**	**0.010**	**0.338**	**0.005**	0.623	0.285
Affected versus non-affected status	0.901	0.717				
Household size	**0.610**	**<0.001**	**0.634**	**0.001**	**0.469**	**<0.001**
Age of head of household (by deciles)	**1.176**	**0.001**	**1.134**	**0.048**	**1.272**	**0.006**
Years of schooling (by deciles)	**1.327**	**<0.001**	**1.344**	**0.006**	**1.518**	**0.002**
# employed household members	**2.184**	**0.001**	1.304	0.170	**5.706**	**<0.001**
Access to medical aid	**11.162**	**0.022**	5.243	0.133		
Dependency ratio	**1.024**	**0.001**	**1.023**	**0.020**	**1.036**	**0.003**
# persons that are ill	0.809	0.322	0.748	0.254	1.269	0.601
# persons that have died	0.620	0.247	0.557	0.218	0.188	0.201
# orphans in household	1.065	0.656	1.324	0.175	0.852	0.483
Sample (n)		*387*		*193*		*161*
LR chi2 (P)		*87.15 (<0.001)*		*40.27 (<0.001)*		*44.92 (<0.001)*
Pseudo R^2		*0.191*		*0.167*		*0.230*

Note: Odds ratios and P values in bold are statistically significant at the 0.10 level. In the regression model for non-affected households, "access to medical aid" (30 observations) predicted success perfectly and were excluded from the model.

Only one determinant of poverty status featured in all six regression models, i.e. the total sample and sub-samples of affected and non-affected households interviewed in wave I and in wave II of the survey (Tables 3 and 4). Smaller (larger) households were more (less) likely to be classified as non-poor, which makes sense insofar as the available household resources are divided between fewer (more) persons, thus increasing (decreasing) the aggregate level of welfare of the particular household.

A number of other conventional determinants of poverty also featured in these models, although the results were not always statistically significant in all six of the regression models presented in Tables 3 and 4. The strongest single predictor of poverty status was access to medical aid. Households with access to medical aid in general respectively were 26 (wave I) and 11 times (wave II) more likely to not be poor. There are a number of plausible explanations for this relationship. On the one hand, medical aid may help households affected by illness and/or death to avoid medical expenditures, which could make higher expenditures at a later stage affordable. However, medical aid coverage may also simply be a marker for having a good job, which implies higher income and expenditure. Alternatively, medical aid cover to lower income earners often excludes dependents, meaning that it only protects households if the breadwinner falls ill. Most likely, though, access to medical aid here represents a proxy of socio-economic status rather than a factor directly linked to the impact of HIV/AIDS, given that most ill persons and those that have died had accessed public health care facilities (Booysen *et al.*, 2002). Follow-up surveys and the further analysis of this dataset will help elucidate this causal pathway.

Households with a larger number of employed members and households sharing a larger number of years of schooling between its members were as expected more likely to be non-poor, as were households residing in urban rather than rural areas, and households headed by females and by older persons. Households with larger dependency ratios were also more likely to be classified as non-poor. In the case of affected households, the latter may imply that households with more children and older persons find it easier to cope with illness and death insofar as potentially economically active household members do not have to care for ill persons, which may result in a loss of income to the household. However, this result is ambiguous insofar as one would have expected a higher dependency ratio to increase the likelihood of being classified as poor, given that the household has to share its resources amongst a larger number of primarily economically inactive persons. This

particular finding needs to be explored in relation to the receipt of social welfare grants, especially old age pensions and child support grants. Uptake of these grants may mean that households with more children and elderly persons actually are more likely to be classified as non-poor in societies characterized by high levels of unemployment.

The HIV/AIDS specific determinants of poverty included in these regression models, i.e. the number of persons in each household that reportedly were chronically ill in the month preceding the interview or that had died in the six months preceding the interview and the number of orphans sheltered by the household, did not feature as statistically significant determinants of poverty. Interesting, however, is that these variables did feature in the regressions that employed total average household income rather than adult equivalent per capita income as measure of household welfare. Poverty in this case was defined relative to the guideline of R800 per household per month employed by local government in administering indigent policy in South Africa. Affected households, i.e. households that include at least one person that is known to be HIV-positive, in wave II were more likely than non-affected households to be classified as poor, as were households that had experienced a larger number of recent deaths (i.e. deaths occurring in the period between the two rounds of interviews). In the case of affected households (wave II), the number of orphans also featured as a significant determinant of poverty. Affected households with more orphans were more likely to be classified as non-poor. One would however have expected households with more orphans to be more likely to be poor, given that the available resources have to be shared amongst more people. As argued elsewhere, this particular finding needs to be explored in relation to the uptake of child support grants, because households with a larger number of orphans theoretically are in a position to access these grants, thus boosting their household income. Lastly, non-affected households including a larger number of ill persons were more likely to be non-poor. This result is spurious, given that increased incidence of illness is more likely be associated with poverty. Further analysis it is hoped will be able to tease out the reasons behind this result.

The longitudinal design of this study also allows one to perform analyses that look at the relationship between poverty and its determinants over time. This allows one to look at the determinants of poverty in the shorter and longer term, i.e. those factors that explain why households may have remained in poverty over the entire

period, remained poor only in the short term (classified as poor in wave I or in wave II) or not been classified as poor in either wave of the panel. The results of these analyses are reported in Table 5. Certain baseline (wave I) characteristics were included in the analysis, e.g. place of residence, affected status, household size, the age and gender of the head of the household, and the years of schooling and number of employed members. Other variables, such as the dependent variable, now distinguish between households that were classified as non-poor in both waves (value=3), as non-poor in wave II only (value=2) or non-poor in wave I only (value=1), and those classified as poor in both waves (value=0). As in the case of the other results presented here, the poverty line was set with reference to the R250 adult equivalent per capita level. The following variables based on changes between wave I and II were also included in the regression analyses:

- access to medical aid in wave I and II, i.e. whether households had access to medical aid in both waves, only in one, or in neither wave
- change in household size between wave I and II
- change in dependency ratio between wave I and II
- incidence of morbidity in wave I and II, i.e. whether households had experienced illness in both waves, only in one, or in neither wave
- incidence of mortality in wave I and II, i.e. whether households had experienced a recent death in both waves, only in one, or in neither wave
- change in shared number of years of schooling between wave I and II
- change in number of employed household members between wave I and II
- sheltering of orphans by household, i.e. whether households had sheltered an orphan in both waves, only in one, or in neither waves
- household moved to a new residence between wave I and II
- change in gender of the head of the household between wave I and II, either from male to female or from male to female
- change in age of the head of the household between wave I and II

Table 5: Predictors of income-based household poverty status between waves I and II: Multiple regression models

Explanatory variables and summary statistics	Total		Affected households		Non-affected households	
	b	**P**	b	**P**	b	**P**
Urban versus rural location in wave I	**-0.222**	**0.057**	-0.184	0.283	**-0.306**	**0.055**
Affected versus non-affected status	-0.125	0.386				
Access to medical aid in waves I and II	**0.404**	**<0.001**	**0.379**	**0.015**	**0.460**	**<0.001**
Male versus female head of household in wave I	**-0.179**	**0.137**	**-0.392**	**0.026**	-0.060	0.707
Age of head of household (by deciles) in wave I	**0.140**	**0.001**	0.059	0.337	**0.185**	**0.001**
? in household size between wave I and II	-0.084	0.262	**-0.293**	**0.003**	**0.206**	**0.099**
Affected by morbidity in waves I and II	**-0.224**	**0.008**	**-0.310**	**0.006**	-0.189	0.175
Affected by mortality in waves I and II	-0.032	0.829	-0.070	0.671	**-1.229**	**0.015**
Total years of schooling in wave I	**-0.110**	**0.008**	**-0.129**	**0.018**	-0.013	0.833
? in years of schooling between waves I and II	**0.071**	**0.087**	**0.168**	**0.007**	-0.035	0.529
Total number of employed members in wave I	**0.333**	**<0.001**	0.172	0.229	**0.388**	**0.001**
? in number of employed household members between waves I and II	**0.151**	**0.051**	0.069	0.444	**0.311**	**0.049**
Household sheltered orphan in waves I and II	-0.013	0.861	0.116	0.256	-0.067	0.533
Household did not live at same residence during waves I and II	-0.225	0.590	0.177	0.752	-0.254	0.699
? in gender of household head between waves I and II	**-0.417**	**0.040**	**-0.578**	**0.034**	-0.128	0.685
? in dependency ratio between waves I and II	-0.000	0.996	-0.002	0.475	0.005	0.136
? in age of household head between waves I and II	0.001	0.895	0.016	0.160	**-0.053**	**0.019**
Constant	**2.380**	**0.001**	**2.641**	**0.002**	**2.842**	**0.005**
Sample (n)		*386*		*194*		*192*
F value (P)		*5.67 (<0.001)*		*3.67 (<0.001)*		*4.90 (<0.001)*
Adjusted R^2		*0.170*		*0.181*		*0.231*

Note: Poverty line = R250 adult equivalent per capita income per month. Coefficients and P values in bold are statistically significant at least at a 0.10 level, using a two-tailed t test.

According to the results presented in Table 5, households in all cases (i.e. in the total sample and sub-samples) were less likely to be poor if they had access to medical aid at the time the two rounds of interviews were conducted. As argued elsewhere, access to medical aid here most likely represents a proxy of socio-economic status rather than a factor directly linked to the impact of HIV/AIDS.

As in the case of the results presented in Tables 3 and 4, the other statistically significant determinants of poverty status featured only in some of the regressions, e.g. the total sample or the sample of affected and non-affected households. *Households in general* were more like to have remained in poverty if they reside in a rural area, if the household in wave I was headed by an older person and by a female, if the household was affected by morbidity in both waves, and if headship of the household had changed in terms of the gender of that person. Education and employment also featured as significant determinants of poverty. Household that at baseline had included a larger number of employed persons were more likely to be classified as non-poor, as were households in which the total years of schooling and number of employed members had increased between the two rounds of interviews. The coefficient of the years of schooling at baseline was also statistically significant, but had the wrong sign (households with fewer years of schooling at baseline were more likely to be classified as non-poor, whereas as one would have expected the opposite to be the case).

In the case of *affected households*, household were more likely to remain in poverty if the household at baseline was headed by a female, if the size of the household had declined, if the household was affected by morbidity in both waves, if the number of years of schooling share by the members of the household had declined, and if headship of the household had changed in terms of the gender of that person. As in the case of the regression results for the combined sample of affected and non-affected households, the coefficient of the years of schooling at baseline, although statistically significant, had the wrong sign, with households with fewer years of schooling at baseline being more likely to be classified as non-poor.

Non-affected households in turn, were more like to have remained in poverty if they reside in a rural area, if the household head at baseline was an older person, if the age of the head of the household had increased, if the size of the household had increased, and if the household was affected by mortality in both waves. Non-affected households were also more likely to consistently be classified as poor if the household

at baseline had included a smaller number of employed members and if the number of employed persons in the household had declined by the time of second round of interviews.

Differences, therefore, in the incidence of morbidity represents a significant determinant of poverty status, with households in general and in particular affected households that were not affected by morbidity in either wave being less likely to be classified as poor. This may point to the possible role of chronic HIV/AIDS-related illness in entrenching poverty at the household level. In the case of the non-affected households, households that had not experienced a death in either wave were more likely to be classified as non-poor. The fact that this is only true for non-affected households and not for affected households or for households in general may be the result of deaths in affected households (where almost all the reported deaths occurred) not resulting in an income loss due to the person not being employed at the time immediately before or leading up to their death (Booysen *et al.*, 2002).

Interesting as well, is the difference in the nature of the relationship between changes in the household size and poverty status. Affected households were more likely to be classified as non-poor if the size of the household had declined, which makes sense insofar as it means that available resources are divided amongst fewer members. Non-affected households in turn were more like to be non-poor if the size of the household had increased. This could mean that those members joining non-affected households are more likely to contribute to household income than is the case with affected households, where in-migrating members may be orphaned children or the elderly members from the extended family having to care for these children and/or the ill person in that household. More analysis (particularly of the data collected on the characteristics of persons leaving and joining these households between consecutive rounds of interviews) is required to further explore these particular dynamics of changes in household income.

In summary, these regression results show that not only conventional determinants of poverty (e.g. place of residence, gender of household head, employment and education), but also HIV/AIDS-related determinants (e.g. incidence of morbidity) play a role in explaining why some households are poorer than others.

4. CONCLUSION

Affected households are poorer than non-affected households, regardless of whether income is measured at the household or individual level or in adult equivalent terms and regardless of the poverty line and poverty measure employed in measuring poverty. These poverty comparisons are relatively robust, particularly so in the case of the comparison of affected households that have experienced illness or death (and who also bear the major share of the burden of poverty) with affected households that have not experienced illness or death. In other words, the incidence, depth and severity of poverty are relatively worse among affected households and especially among affected households that have suffered illness or death in the recent past.

Evident as well is that affected households and particularly households that have recently experienced illness or death may be more likely to experience transitory poverty, i.e. to have moved into or out of poverty over time, which probably indicates the extent to which morbidity and mortality cause household income to fluctuate. There is also evidence that the extent of income inequality and the incidence, depth and severity of poverty within this relatively small sample of households may be on the increase, albeit the case in both the affected and non-affected group of households.

The regression results suggest that not only conventional determinants of poverty, such as employment, education and household size, but also HIV/AIDS-related determinants such as the presence of morbidity play a role in explaining why some households are poorer than others. Lack of access to medical aid has been shown to be the strongest single predictor of poverty status, which probably hints at the importance of employment and education in explaining differences in socio-economic status. The findings therefore suggest that the introduction of a broad-based social security system offering minimal benefits or of specifically targeted welfare programs may in the short and medium term be important in mitigating certain aspects of the impact of the epidemic, e.g. ensuring food security, making sure that children attend school and mitigating the burden of funeral costs, particularly in the case of households that have directly experiences illness or death. In the longer run, however, continued efforts at poverty reduction through improved education opportunities and job creation are likely to remain important. It also means that efforts aimed at ensuring HIV-infected persons equitable access to the labor market will remain crucial in keeping these households from slipping further into poverty.

Subsequent follow-up of these households will provide further information on trends in health and socioeconomic status, thus elucidating these complex relationships.

5. APPENDICES

Appendix A: Poverty Transition Matrix for Affected Households Wave I-II

		Wave II							
		< 0.5 * PL	< PL	< 1.25 * PL	< 1.5 * PL	< 2 * PL	> 2 * PL	Total	No. of households
Wave I	< 0.5 * PL	47.8	21.7	21.7	0	0	8.7	100	23
	< PL	9.3	44.2	20.9	9.3	2.3	14.0	100	43
	< 1.25 * PL	16.7	20.8	33.3	4.2	16.7	8.3	100	24
	< 1.5 * PL	0	25.0	33.3	0	33.3	8.3	100	12
	< 2 * PL	0	0	7.1	21.4	35.7	35.7	100	14
	> 2 * PL	6.6	4.9	6.6	8.2	16.4	57.4	100	61

Note: Poverty line = R250 adult equivalent per capita income per month. P<0.001.

Appendix B: Poverty Transition Matrix for Non-affected Households Wave I-II

		Wave II							
		< 0.5 * PL	< PL	< 1.25 * PL	< 1.5 * PL	< 2 * PL	> 2 * PL	Total	No. of households
Wave I	< 0.5 * PL	38.9	33.3	11.1	0	0	16.7	100	18
	< PL	8.6	42.9	17.1	5.7	14.3	11.4	100	35
	< 1.25 * PL	0	13.3	40.0	6.7	20.0	20.0	100	15
	< 1.5 * PL	8.3	8.3	0	41.7	33.3	8.3	100	12
	< 2 * PL	6.3	12.5	6.3	6.3	31.3	37.5	100	16
	> 2 * PL	4.4	4.4	2.2	1.1	13.3	74.4	100	90

Note: Poverty line = R250 adult equivalent per capita income per month. P<0.001.

Appendix C: Poverty Transition Matrix for Affected Households suffering Illness or Death between Wave I and Wave II

		Wave II							
		< 0.5 * PL	< PL	< 1.25 * PL	< 1.5 * PL	< 2 * PL	> 2 * PL	Total	No. of households
Wave I	< 0.5 * PL	33.3	27.8	27.8	0	0	11.1	100	18
	< PL	12.9	45.2	19.4	9.7	3.2	9.7	100	31
	< 1.25 * PL	19.0	23.8	23.8	4.8	19.0	9.5	100	21
	< 1.5 * PL	0	33.3	33.3	0	22.2	11.1	100	9
	< 2 * PL	0	0	11.1	33.3	33.3	22.2	100	9
	> 2 * PL	6.9	3.4	6.9	13.8	17.2	51.7	100	29

Note: Poverty line = R250 adult equivalent per capita income per month. P<0.001.

Appendix D: Poverty Transition Matrix for Affected Households suffering no Illness or Death between Wave I and Wave II

		Wave II							
		< 0.5 * PL	< PL	< 1.25 * PL	< 1.5 * PL	< 2 * PL	> 2 * PL	Total	No. of households
Wave I	< 0.5 * PL	100.0	0	0	0	0	0	100	5
	< PL	0	41.7	25.0	8.3	0	25.0	100	12
	< 1.25 * PL	0	0	100.0	0	0	0	100	3
	< 1.5 * PL	0	0	33.3	0	66.7	0	100	3
	< 2 * PL	0	0	0	0	40.0	60.0	100	5
	> 2 * PL	6.3	6.3	6.3	3.1	15.6	62.5	100	32

Note: Poverty line = R250 adult equivalent per capita income per month. P<0.001.

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