

# **Living standards and childhood mortality in the era of HIV/AIDS: Malawi**

*Henry V. Doctor, University of the Western Cape*

*Tukufu Zuberi, University of Pennsylvania*

## **Abstract**

The HIV/AIDS epidemic has an enormous impact on adult mortality and child survival. The adult HIV seroprevalence in Malawi is about 15 percent, and there is already evidence of an increase in child mortality between 1992 and 2000 apparently due to HIV/AIDS. If HIV/AIDS is a probable candidate in the observed distortion, then the results are in the expected direction. In our analysis of DHS (1992 and 2000) and Census data (1987 and 1998) we find an enormous increase in child mortality during the period under investigation. We also find an unanticipated inverse relationship between the Living Standard Index and child mortality. Using two independent sources of data confirms our empirical findings. We provide several alternative explanations for these findings.

## **Introduction**

Membership in a higher socioeconomic status (SES) (e.g., characterized by more education, higher income, urban residence, and better housing types) has a significant effect on different demographic outcomes such as lower infant and child survival (United Nations 1985; Muhuri 1996; Filmer and Pritchett 2001). Most of these studies have analyzed the association between SES and children's survival by focusing on data on asset-ownership which includes, for example, owning a bicycle, radio or television; housing characteristics such as number of rooms or type of toilet facilities; and source of water. These household characteristics are not only considered as asset indicators, but they are also conceived as having a role in shaping child mortality differentials in a country either directly or indirectly.

During the last decades researchers have adopted different approaches in studying the relationship between SES and different demographic outcomes depending on their principal objectives and data availability. Because of the direct and indirect effects of SES on the demographic outcome variable, some researchers either present their analyses by examining the effect of each of the variables of interest separately, or treat them together as a proxy for SES by creating a composite index (Bawah 2002).

A proxy for SES is not only useful in examining effects of wealth, but also is needed as a “control” variable in estimating effects of variables potentially correlated with household wealth, such as maternal education. The approach among researchers of using proxies for SES and creating a composite index arose as a result of the absence of either income or expenditure data. For example, income is not often used as a measure in less developed countries because households frequently draw their income from multiple sources that can change from year to year and even from season to season. Hence it is a challenge for researchers to track these changes (Montgomery et al. 2000).

In this paper we use a method consistent with other approaches (e.g., Filmer and Pritchett 2001; Bawah 2002) which uses a combination of household variables such as roofing materials, wall materials, flooring materials, main source of drinking water, type of toilet facilities, household possessions, and source of energy as a proxy for SES. We then use them to create a living standards index (LSI) in a multivariate model to examine its relationship with childhood mortality in Malawi using the 1987 and 1998 Malawi census data. The objectives are: 1] to investigate how the level of the household’s SES affects the survival chances of the children, and 2] to find out whether between 1987 and 1998 levels of poverty changed in Malawi and the extent to which this change may have affected children’s survival chances. Another interest is to find out the variations in asset ownership by place of residence (rural/urban) in the two censuses.

In the context of Malawi, as is the case in other African countries, the idea of employing household characteristics as a proxy for SES to examine its relationship with mortality is not only prudent but also simple: the type of household characteristics and material possessions owned by the household are useful determinants of the health status of household members, particularly children, as well as indicators of the SES of households such as their purchasing power (Bawah 2002). Furthermore, the interest in this paper is to examine the combined effect of household characteristics (as an indicator of SES or living standards) and not the individual effect of the variables.

## **Data**

The Malawi census data are obtained from the archives of The African Census Analysis Project based at the University of Pennsylvania, Population Studies Center (<http://www.acap.upenn.edu>). These data are used to create a composite household LSI and investigate its effect on child mortality in Malawi in 1987 and 1998.

## Methods

Using the information available in the census data, we use a straightforward and pragmatic statistical procedure called principal components analysis (Filmer and Pritchett 2001) to aggregate different asset indicators into one variable to proxy for household “wealth.” We examine how child mortality (children dead) differs in Malawi according to the household’s living standard. We hypothesize that mortality is likely to be higher in “poorer” than in “richer” households. Negative binomial regression is used because we observe the number of children ( $\geq 0$ ) who have died out of those ever borne by women. The negative binomial model also includes an offset term which adjusts for exposure and its coefficient is constrained to one. Consistent with other approaches (Das Gupta 1997; Bawah 2002), we use children ever born as an offset term. This variable accounts for the effect of fertility and duration of exposure since the risk of mortality for children depends on the number of children who are already born. The estimated negative binomial model will adopt the maximum likelihood regression.

## Results

Findings on the relationship between child mortality and living standards produces meaningful results (at least for 1987), which are consistent with earlier studies on the negative association between wealth and child mortality (e.g., Das Gupta 1997; Bawah 2002). When the asset index is applied to the 1987 census data, the results show an increase in mortality for children who come from poor households. However, the results in 1998 differ from those in 1987 in that child mortality is higher among the rich households in 1998 and also among middle-aged women. We argue that based on the magnitude of the HIV/AIDS prevalence in Malawi and given the timing of the 1998 census in the stage of the AIDS epidemic, and also consistent with findings of high mortality in all households and high social class groups in Malawi (Bollinger, et al. 2000; National AIDS Commission [Malawi] 2003), the shift in the effect of the LSI on child mortality may be attributed to this deadly disease. In brief, these studies confirm the fact that AIDS has had (and is still having) serious economic impact on households. The epidemic is expected to increase the death rate at all ages with the most severe impact observed among adults in the prime working ages and among children under age 5.

The results of this study suggest that in African populations such as Malawi, where information on income or other direct measures of SES are scarce, employing information on

household characteristics can provide researchers with valuable insights into other socioeconomic outcomes such as morbidity, utilization of health facilities, fertility, and contraceptive use.

The kind of analysis employed in this paper often raises questions about the suitability of the composite index of living standards as it relates to child mortality; that is, what is the differential contribution of the individual variables in creating the living standards index. The most important thing to remember is that the variables used in the analysis are viewed in their role as a proxy for SES. The index *is not* conceptualized as representing the individual effect of these variables on mortality *but* as a proxy for income. Although the index is weak in capturing the effects of the two key determinants of modern mortality improvements, that is, improvements driven by individual behavior—such as good nutrition as a result of rising income (McKeown, et al. 1975)—and changes driven by public health measures, this index captures the combined effect of these two key determinants at least in settings with limited data on income measures.

## References

- Bawah, A.A. 2002. *Health, Well-being, and Mortality in Africa*. Ph.D. dissertation in Demography, University of Pennsylvania.
- Bollinger, L., Stover, J. and Palamuleni, M.E. 2000. *The Economic Impact of AIDS in Malawi*. Washington DC and North Carolina: The Futures Group International, Research Triangle Institute, and The Centre for Development and Population Activities.
- Das Gupta, M. 1997. “Socio-Economic Status and Clustering of Child Deaths in Rural Punjab.” *Population Studies* 51, (2): 191–202.
- Filmer, D. and L.H. Pritchett. 2001. “Estimating Wealth Effects Without Expenditure Data--Or Tears: An Application to Educational Enrollments in States of India.” *Demography* 38, (1): 115–132.
- McKeown, T., R.G. Record, and R.D. Turner. 1975. “An Interpretation of the Decline of Mortality in England and Wales During the Twentieth Century.” *Population Studies* 29, (3): 391–422.
- Montgomery, M.R., M. Gragnolati, K.A. Burke, and E. Paredes. 2000. “Measuring Living Standards with Proxy Variables.” *Demography* 37, (2): 155–174.
- Muhuri, P.K. 1996. “Estimating Seasonality Effects on Child Mortality in Matlab, Bangladesh.” *Demography* 33, (1): 86–110.
- National AIDS Commission [Malawi]. 2003. *HIV/AIDS in Malawi: Estimates of the prevalence*

*of infections and the implications.* Lilongwe, Malawi: National AIDS Commission.

United Nations. 1985. Socioeconomic Differentials in Child Mortality in Developing Countries, ST/ESA/SER. A/97. New York.