

Reexamining Living Standards and Childhood Mortality in Malawi

Henry V. Doctor
University of the Western Cape
Department of Statistics
Private Bag x17
Bellville
7535
South Africa
E-mail: hdoctor@uwc.ac.za

Paper prepared for presentation at the Annual Meeting of the Population Association of America,
New York, NY, March 29–31, 2007.

Reexamining Living Standards and Childhood Mortality in Malawi

Abstract

Studies worldwide have established a close link between higher socioeconomic status (SES) and demographic outcomes such as lower infant and child survival. This relationship has often been studied by utilizing information on ownership of household assets. Recently, we examined the effect of a proxy for SES on child survival in Malawi using the 1987 and 1998 census data. Results showed that in 1987 there was an increase in mortality for children belonging to poor households; in 1998 results were reversed: child mortality was higher among rich households and also among middle-aged women. Parallel analysis of the 1992 and 2000 DHS data showed similar results. We replicate our earlier analyses and assess whether the results persist in the 2004 DHS. Results show that child mortality is higher in richer households but at lower levels than those observed earlier owing to modest improvement in the living standards of people.

Introduction

A number of studies both in developed and less developed countries have established a close link between membership of a higher socioeconomic status (SES) and a number of key demographic outcomes such as lower infant and child survival (Muhuri 1996; Filmer and Pritchett 2001). The relationship between SES and children's survival has often been studied by utilizing information on ownership of household assets such as radio, television, housing characteristics, sources of water, and type of toilet facilities. These household characteristics are considered as asset indicators that have a direct or indirect effect on child survival.

Among the various methods that are used to assess the effect of SES (through information on household characteristics) on child survival, one of them stands out: a proxy measure for SES derived through principal components analysis (PCA). A proxy for SES is not only useful in examining the effects of wealth but also useful as a control in estimating the effects of variables that are potentially correlated with households such as maternal education. A proxy for SES in form of a composite index of wealth has been widely used in many countries due to the lack of reliable data on income and expenditure.

In an earlier study (Doctor 2004), we examined the effect of a proxy for SES on child survival in Malawi, a poor country with an estimated population of about 13 million people and an HIV prevalence rate of 12 percent in 2006 (National Statistical Office (NSO) [Malawi] and ORC Macro 2005). In this study, we were motivated by the lack of studies that have examined the effect of SES on child survival using larger data sets such as the census particularly in the context of the HIV/AIDS epidemic. While there have been a number of studies on childhood mortality in Malawi, most of them have focused on region of residence and income as

explanatory variables. Further, they have been done on small pockets of the population whereas our current study is on a macro level.

Brief Overview of the Literature on Living Standards and Child Mortality

A detailed review of the relationship between living standards and childhood mortality is available elsewhere (see Doctor 2004; Bawah 2002; Hobcraft, et al. 1984; United Nations 1985; Casterline, et al. 1989; Cleland, et al. 1992; Madise 1996; Desai and Alva 1998; Madise, et al. 1999). The basic idea behind information on household possessions is that households with piped water, flush toilets, a finished cement floor, roofing made from metal, using electricity for cooking, or those that possess a variety of consumer goods (ranging from a table or a chair to a telephone, television, or a washing machine) are more likely to achieve good health status than those without these facilities or those that rely on surface water, pit latrines, rudimentary floors, etc. (Bawah 2002). These household possessions are considered as indicating the level of affordability of obtaining good health services and some are markers of the capacity for personal hygiene.

Thus, we conceptualize the relationship between living standards and child mortality by building on the Mosley and Chen (M-C) (1984) framework and the economic model of the family to focus on the effects of household possessions on child mortality. The M-C framework has been widely used and results on the role of socioeconomic development as an important factor in mortality decline both in historical countries of Europe (McKeown and Record 1962; McKeown, et al. 1975) and other parts of the developing world (Hobcraft, et al. 1984; United Nations 1985; Casterline, et al. 1989; Cleland, et al. 1992; Madise 1996; Desai and Alva 1998; Madise, et al. 1999) have been well documented. For example, Haines (1995) using data from

the 1911 census of the Fertility and Marriage of England and Wales studied patterns of mortality decline by socioeconomic characteristics, principally the occupation of the husband. The aggregate results showed that social class in England and Wales during the 1890s and 1900s tended to be related to the speed of mortality decline: childhood mortality declined more rapidly in affluent social class groups. Overall, social class (or occupation group), income, and urbanization were more successful in explaining mortality levels than time trends across occupations, although social class and the extent of urbanization did reasonably well in accounting for trends. In the less developed world, useful insights on the effect of SES (as measured by variables such as occupation status of mothers, income, and housing characteristics) on child survival were found by a 15-country study conducted by the United Nations (1985). These studies have demonstrated the importance of SES as a predictor of mortality, since the latter is an outcome rather than a cause and thus serves as a direct measure of the distribution and use of resources (Haines 1995).

Data and Methods

Data

Data from our earlier study came from the Malawi censuses (1987 and 1998) and the Malawi Demographic and Health Surveys (DHS) (1992 and 2000). The census data were obtained from the archives of The African Census Analysis Project based at the University of Pennsylvania (<http://www.acap.upenn.edu/>) whereas the DHS data were obtained from Measure DHS (www.measuredhs.com). The 1987 census included information on 38 household asset indicators that are grouped into two types: characteristics of household dwelling and household ownership of consumer durables. The 1998 census included information on 26 household asset indicators

with similar groupings. Data from the 1992 and 2000 DHS had similar information on household characteristics as those collected in the censuses and were largely used to compare the results from the censuses. That is, the 1992 DHS was utilized because it is close to the 1987 census whereas the 2000 DHS is close to the 1998 census. The earlier analyses are replicated using the 2004 Malawi DHS.

Methods

The information on household characteristics from the censuses and DHS were used to compute a composite index of living standards using PCA (Filmer and Pritchett 2001). We were interested in assessing whether child mortality differs in Malawi according to the level of the household's living standard. Our hypothesis was that mortality is likely to be higher in "poorer" than "richer" households. A measure of mortality (i.e., number of children dead) was obtained from women of childbearing age using information on the number of children ever born (CEB) and the number of children surviving. Negative binomial regression model was used with CEB as an offset term to model the number of children dead on the living standards index (LSI) before and after adjusting for other socio-demographic factors. The CEB, used as an offset term in the negative binomial regression, 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.

Results

In brief, the key results in our study showed that when the LSI was applied to the 1987 census data, the results showed an increase in mortality for children belonging to poor households. Results from the 1998 census were contrary to expectation: child mortality was higher among

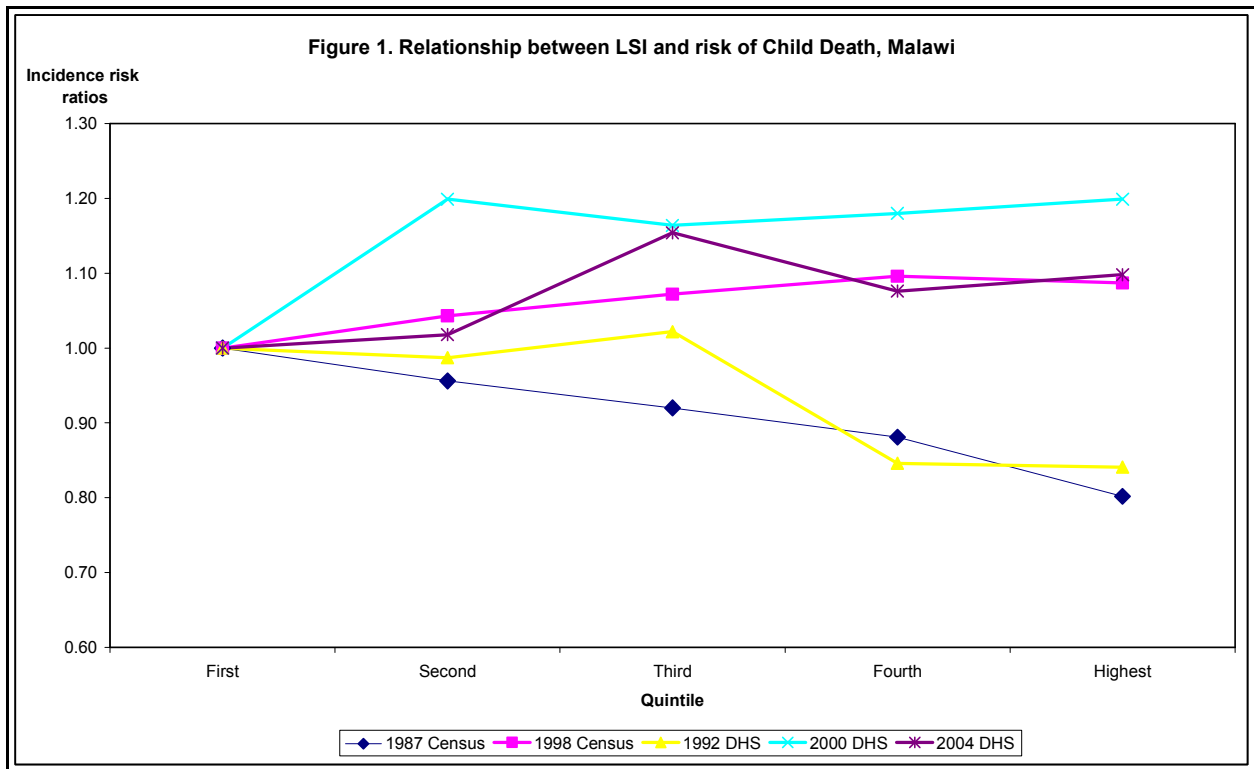
rich households and also among middle-aged women. Since these results looked odd, we made parallel analysis of the 1992 and 2000 DHS data and observed consistency in the direction of the estimates. We argued that based on the magnitude of the HIV prevalence in Malawi, the reversal in the effect of the LSI on child mortality may be attributed to this pestilence.

A Re-examination

Results from the 2004 Malawi DHS show that between 2000 and 2004, child mortality declined by 29 percent (NSO [Malawi] and ORC Macro 2005). Thus, the present paper attempts to assess (by replicating the analysis from the previous study) whether this decline is captured by the relationship between the LSI and child mortality using the 2004 DHS (also available from Measure DHS). If child mortality has declined substantially between 2000 and 2004, we expect that the reversal in the effect of the LSI on child mortality that was observed in the 1998 census and 2000 DHS should disappear. In other words, the effect of the LSI on child mortality should be lower in “rich” households in 2004.

The re-examination proposed here is important for three main reasons: First, recent estimates show that the adult (15-49) HIV prevalence has been declining over the last few years from about 16 percent in 2001 to about 12 percent in 2004 (NSO [Malawi] and ORC Macro 2005). Second, regular collection of large-scale population data sets in Malawi is very rare. For example, the next census is scheduled for 2008 and it is uncertain whether it will be conducted due to financial and logistical constraints. And lastly, a continuous assessment of poverty and mortality-related indicators is inevitable in Malawi as the country pursues to achieve, by 2015, the Millennium Development Goals set by the United Nations. We cannot take it at face value

that child mortality in “richer” households has declined than in “poor” households. A re-examination of the trends observed in our previous study is crucial to inform policy.



The results presented in Figure 1 are based on the baseline model of the relationship between living standards and child mortality. Full details of the model estimates for other control variables such as age group of women and place of residence are available from the author upon request. These results show that child mortality level in 2004 is still higher in richer households but at lower levels than those observed in the 2000 DHS and generally at par with the estimates from the 1998 census except for the third quintile.

Conclusion

The reversal in mortality trends observed here, that is, from low levels among rich households in 1987/1992 to high levels in 1998/2000 and then a reduction in 2004 may be attributed to modest improvement in the living standards of people. Malawi's life expectancy at birth is still one of the lowest in the world (42 years for females; 41 years for males) with 76.1 percent of people living on less than a US\$ 2 per day. The country ranks 165 and 85 on the Human Development and Human Poverty Indices respectively (UNAIDS 2006). These factors, *inter alia*, are challenges for Malawi and it is not unreasonable to expect them to lead to persistent high mortality in rich households. As reported by National Statistical Office (NSO) [Malawi] and ORC Macro (2005), there has been little change in the factors associated with decreases in child mortality in the three DHS (i.e., 1992, 2000, and 2004). For example, it is reported that among women giving birth in the five years prior to each survey, the percentage receiving antenatal care from a doctor or nurse/midwife was about the same (90, 91 and 93 percent, respectively). The percentage receiving tetanus toxoid during pregnancy was unchanged (85 percent in all three surveys), and the proportion of deliveries assisted by a doctor or nurse/midwife changed little (55, 56, and 57 percent) (*ibid*: 127).

Chief to the reduction in child mortality is tight fiscal management on the part of the Government of Malawi. An assessment by International Monetary Fund (IMF) shows that in December 2000 a three-year the Poverty Reduction and Growth Facility (PRGF) was established and approved. This was aimed at laying down the objectives of poverty reduction and economic growth more central to the IMF lending operations in poor countries such as Malawi. However, by November 2001, Malawi was off-track with a poor economic performance that improved by 2003. After the new Government of President Bingu wa Mutharika in 2004, the IMF review

found that the economic performance was good associated with improved expenditure management and clampdown on corruption (Scottish Executive Analytic Services Division 2005). This improvement in fiscal management, if sustained, would lead to Malawi receiving additional debit relief and ultimately improved living standards of people. Thus, the observed decline in child mortality may partly be attributed to improved macro-economic policies.

References

- Bawah, AA. 2002. "Health, Well-being, and Mortality in Africa." Unpublished Ph.D. dissertation in Demography, University of Pennsylvania.
- Casterline, J.B., E.C. Cooksey, and A.F.E. Ismail. 1989. "Household Income and Child Survival in Egypt." *Demography* 26 (1):15–25
- Cleland, J., G. Bicego, and G. Fegan. 1992. "Socioeconomic Inequalities in Childhood Mortality: The 1970s to the 1980s." *Health Transition Review* 2 (1): 1–18.
- Desai, S. and S. Alva. 1998. "Maternal Education and Child Health: Is There a Strong Relationship?" *Demography* 35 (1): 71–81.
- Doctor, H.V. 2004. "The Effect of Living Standards on Childhood Mortality in Malawi." *African Population Studies* 19(2 Suppl A): 241–263.
- Filmer, D. and L. Pritchett. 2001. "Estimating Wealth Effects Without Expenditure Data—Or Tears: An Application to Educational Enrollments in States of India." *Demography* 38(1): 115–132.
- Haines, M.R. 1995. "Socio-Economic Differentials in Infant and Child Mortality During Mortality Decline: England and Wales, 1890–1911." *Population Studies* 49: 297–315.
- Hobcraft, J.N., J.W. McDonald, and S.O. Rutstein. 1984. "Socio-economic Factors in Infant and Child Mortality: A Cross-National Comparison." *Population Studies* 38:193–223.
- Madise, N.J., Z. Matthews, and B. Margetts. 1999. "Heterogeneity of Child Nutritional Status between Households: A Comparison of Six Sub-Saharan African Countries." *Population Studies* 53: 331–343.
- Madise, N.J. 1996. "Child Mortality in Malawi: Further Evidence of Death Clustering Within Families." Pp. 27–35 in *Population Dynamics: Some Past and Emerging Issues*,

edited by R.A. Powell, E.A. Mwageni, and A. Ankomah. Exeter, England: University of Exeter, Institute of Population Studies.

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.

McKeown, T. and R.G. Record. 1962. "Reasons for the Decline of Mortality in England and Wales During the Nineteenth Century." *Population Studies* 16(2): 94–122.

Mosley, W.H. and L.C. Chen. 1984. "An Analytical Framework for the Study of Child Survival in Developing Countries." *Population and Development Review* 10 (Supplement): 15–45.

Muhuri, P.K. 1996. "Estimating Seasonality Effects on Child Mortality in Matlab, Bangladesh." *Demography* 33(1): 86-110.

National Statistical Office (NSO) [Malawi] and ORC Macro. 2005. *Malawi Demographic and Health Survey 2004*. Calverton, Maryland: NSO and ORC Macro.

Scottish Executive Analytical Services Division. 2005. "Malawi Economic Brief: May 2005." Finance and Central Services Department, Government of Scotland.
<http://www.scotland.gov.uk/Resource/Doc/54357/0012603.pdf>; Accessed 27 February 2007.

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

UNAIDS. 2006. *2006 Report on the Global AIDS Epidemic*. Geneva, Switzerland: UNAIDS.