

SOCIOECONOMIC INEQUALITIES IN CHILD MORTALITY IN THREE RURAL TANZANIAN DISTRICTS

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Background

Since 2000, global health initiatives and resources for health have increased sharply which has increased coverage of life-saving child health interventions in several countries (Horton, 2006; Masanja et al., 2008). As the result, child mortality is declining in most of developing countries after decade of stagnation in the 1990s (Murray et al., 2012; Trape et al., 2011). However, sub-Saharan Africa has still high level of child mortality compared with other developing regions (United Nations, 2012). However, the social, demographic and residential inequalities in child mortality remain considerable in most of Developing countries. The socioeconomic inequalities in child mortality have been documented in many studies. The relationship between socioeconomic status (SES) and child mortality is strongly significant with a high mortality rate frequently concentrated in the worse-off. These inequalities exist according to all measures of socioeconomic status; household wealth or income (Houweling et al., 2005; Maglad, 2000), maternal education (Bicego and Boerma, 1993), social class (Pamuk, 2000; Kwanchit, 2010), as well as geographical setting (Fotso, 2006). Paradoxically, the impact of socio-economic status on rapid decline of child mortality in sub-Saharan Africa has rarely been studied. This paper proposes to extend this proposition by examination the role of SES of the household on child mortality decline in Tanzania. Specifically, we aim to test the hypothesis that the impact of indicators of health equity, such as maternal education and relative household wealth, diminish as the health transition progresses.

Objective

This paper measures the level and analyses trends and determinants of child mortality in rural Tanzania from 2000 to 2010, a period of rapid transition in childhood survival. The analysis aims to clarify the role that SES of household has played in explaining the relative pace of under-five mortality decline over a decade of surveillance and also to elucidate interaction of proximity with social determinants of child survival as the transition progresses.

Hypothesis

This paper examines hypotheses about the relative contribution of social and economic change as determinants of the rapid decline of mortality in under-five year olds in rural Tanzania.

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Data and method

Ever since 1996, the Ifakara Health Institute has maintained an integrated health and demographic surveillance system (HDSS) in three rural districts of the Coastal and Morogoro regions (Rufiji, Kilombero and Ulanga). Since then, household information (birth, union, migration, death and causes of death...) is updated through regular visits, whereby each household is visited thrice (once in every four months) a year in three rounds³. Data on social and economic characteristics that define health equity have been compiled in HDSS areas over time, once a year (Schellenberg, 2001; Mwageni, 2002).

The SES index was constructed using the principal component analysis proposed by Filmer and Pritchett, (2000) and was derived from several variables, comprised of household assets (e.g., television, radio, refrigerator, etc), housing characteristics (quality of household materials), and sanitary amenities (e.g., water supply and toilet).

We draw the general trends of child mortality and examine separately the existence of relationships between each characteristic of children, parents, households and the risk of child death (univariate analysis). Then, using multivariate logistic regressions we control effects of significant variables⁴ in the univariate variables to determine factors of child mortality decline. One of models allowing multivariate analysis of survival data is the Cox Model. It measures the risk of death differentials by characteristics of children (sex, age) and mothers (education attainment, age) households (socioeconomic status) in taking into account the time in the regression. The Cox model allows also the analysis of time varying covariates as here the socioeconomic status.

Results and discussion

The mortality has been reduced close to 40% in ten years, from 130 to 80 per 1000 between 2000 and 2010. From 2000 to 2005, the average percentage of annual decrease was slow, only 1.9%; then it accelerated during the next 5 years with 6.4% of annual decrease (annex 1).

The health equity has improved as mortality has declined but that household relative wealth remain as significant covariates of childhood survival. Children of young mothers and living in poor households have a high mortality comparing to others children (annex 2).

Findings respond to debates at the social and economic change as determinants of rapid improvement in the survival of Tanzanian children. Under-five year old mortality in Tanzania reduced from 137 to 81 deaths per 1000 live births between 1992-1996 and 2006-2010 , placing the country on target to achieve Millennium Development Goals (MDG 4) (TDHS 2011; Masanja and al. 2008). However, health inequalities need to be reduced between rich and poor. Policies to reduce mortality rates in Tanzania are needed that focus on particularly children belonging to poor households.

³ One round = four (4) months long for both Ifakara HDSS and Rufiji HDSS

⁴ A statistically significant difference will be defined at $p < 0.05$. Chi2 and Wilcoxon's tests will be used to examine possible associations between risk of child death and characteristics of children, parents, households, etc.

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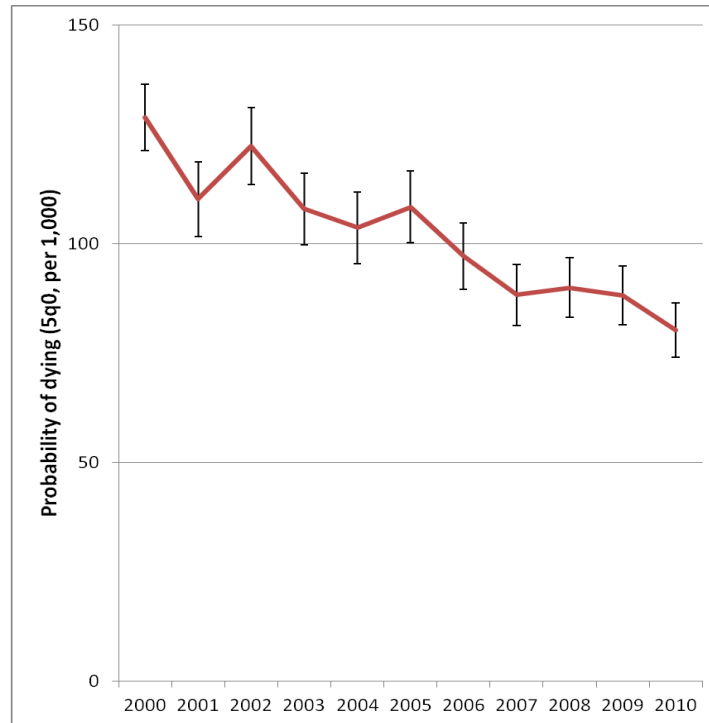
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Annex 1: Child mortality trends (5q0), 2000-2010



Annex 2: Multivariate analysis of child mortality (5q0), 2000-2010

Variable	Type	Hazard Ratio
Gender	Boy	1.08*
	Girl	<i>Ref.</i>
Group age of mother	Under 20 years	1.25***
	20 – 35 years	<i>Ref.</i>
	More than 35 years	1.05
Education of mother	No education	1.16
	Primary	1.13
	Secondary/college	<i>Ref.</i>
SES of household	Poorest	1.28***
	Second	1.25***
	Third	1.23***
	Fourth	1.14*
	Richest	<i>Ref.</i>
Number of children		76846
Number of events		5930
(-Log pseudolikelihood)		65118.38
*** (p<0.001); ** (p<0.01); * (p<0.5);		