MEASURING SOCIOECONOMIC DIFFERENTIALS in ADOLESCENT and ADULT MORTALITY from SIBLING SURVIVAL DATA: a TEST in NORTHERN MALAWI

Authors: A.L.N. Dube[1]*; S. Brumfield, G. Renniers[2]; A. Crampin[1, 2]; S. Geis[4]; S. Helleringer[3]

[1]Malawi Epidemiology and Intervention Research Unit, Lilongwe, Malawi, [2] London School of Hygiene and Tropical Medicine, United Kingdom, [3]Johns Hopkins School of Public Health, [4] Independent Researcher

*Presenting author
E-mail: albert.dube@kpsmw.org
Mobile: +256 991 589 103

Abstract

In developing countries, siblings' survival histories (SSH) are often used to estimate maternal and adult mortality. However, they do not allow measuring socioeconomic differentials in mortality rates, because SSH do not elicit the characteristics of siblings beyond gender, age and vital status. In this project, we assess the feasibility of collecting information on socioeconomic correlates of adult mortality during SSH. We added questions about the educational level of a respondent's siblings, as well as about their household wealth and residence. We are currently collecting such data among a sample of >400 respondents and close to 2,000 of their siblings in the area of the Karonga Health and Demographic Surveillance System (KHDSS) in Malawi. We will measure the reliability of these new data, by comparison to similar data collected prospectively by the KHDSS. We will multivariate models and simulations to assess whether these data may yield accurate estimates of mortality differentials.

Background

Governments and international health agencies need accurate information on births and deaths in populations to help them plan health care policies and monitor the effectiveness of public health programs [1].With child mortality declining rapidly in large parts of the world, they particularly need sufficiently detailed information to identify which population groups are experiencing a disproportionately high adolescent and adult mortality burden. Unfortunately, in most low and middle-income countries (LMICs), such data are not readily available.

In LMICSs, civil registration and vital statistics (CRVS) systems are too incomplete to generate adequate time-series of the number of deaths, and their characteristics. Instead, most LMICs have collect data on adolescent and adult mortality retrospectively. These entails asking a respondent to provide a list of some of their relatives, and then reporting the vital status and age of each of these relatives. They are collected during surveys like the Demographic and Health Surveys (DHS) or the Multiple Indicator Cluster Surveys (MICS). Demographers have recently focused on correcting known biases in SSH (e.g., survivor bias), or on improving the quality of SSH data [2-6]. Such data now play a key role in the statistical models used by the United Nations Maternal Mortality Estimation Inter-Agency Group (UN MMEIG) and the Institute for Health Metrics and Evaluation (IHME) to track global progress towards MDG5 [2, 3]. SSH are also used to evaluate health programs, and the death toll from recent wars [4-6].

SSH however do not collect data on the correlates of mortality rates. On the one hand, we do not know where the siblings of a respondent resided when they died, or at the time of the survey. This precludes obtaining small-area estimates of adolescent and adult mortality rates. On the other hand, SSH do not document the socioeconomic characteristics of a respondent's siblings, including educational level, marital status, household wealth or economic activity. A few studies have nonetheless investigated the risk factors and determinants of adolescent and adult mortality in LMICs using SSH data. In doing so, they have been constrained to assume that respondents and their siblings a) resided in the same area , and b) had the same socioeconomic characteristics. These are very strong assumptions, as there is often significant heterogeneity between siblings in terms of residence, educational attainment or economic activity. If these assumptions are not met, then our estimates of the extent of socioeconomic disparities between geographic areas, or across population groups, will be biased downwards.

In this paper, we test whether socioeconomic data can be collected about each sibling during SSH. To do, we augmented a standard SSH instrument with a few SES-related questions, and we compared the resulting data to prospective SES data collected for each sibling through a health and demographic surveillance (HDSS).

Methodology

Type of study: This is a validation study. It consists of comparing the sibling history data, augmented with data on the residence and socio-economic characteristics of siblings, to reference data collected from a health and demographic surveillance system in northern Malawi.

Place of study: This project will build on the activities of the Karonga Prevention Study (KPS), which has conducted field-based medical research in Karonga district, northern Malawi since 1979 (Figure 1). We will work among the population covered by the Karonga Health and Demographic Surveillance System (KHDSS, [7]). The KHDSS was initiated in 2002 to study HIV epidemiology and monitor the impact of interventions [8-13]. It began with a household census and since then, data on demographic events affecting a population of >35,000 have been collected continuously [14]. Trained village informants keep a real-time record of all births, deaths and migrations occurring within their community. Then, KHDSS interviewers conduct an annual re-census of the study area. During that re-census, they collect data on socioeconomic household and socioeconomic individual data since 2002. We enrol 250 respondents whose deceased sibling was HIV-negative, and 247 respondents whose deceased sibling was HIV-positive.

Data collection: our data will come from an ongoing trial of the use of audio computer assisted self-interviewing (ACASI) for collecting accurate data on HIV-related deaths within SSH. During that trial we also augmented the SSH questionnaire with a few questions related to SES. These included the educational level of the siblings, their occupation, residence and household wealth. We plan to recruit approximately 400 participants aged 15-59 years old in that trial, and we expect them to provide information on close to 2,000 siblings. The SES-related questions are not asked with ACASI, so that data from both study groups can be pooled for the analyses presented in this paper.

Expected Results

We present below (table 1) the distribution of educational levels within the population of the KHDSS. On average, men appear slightly more educated than women. We will first compare the SSH data on SES-related variables to the data collected by KHDSS on the same variables. We will use Kappa and other statistical tools to measure agreement between these different data sources. We will then use multivariate models, which include variables describing the SSH respondent, his/her communities, and the interviewer to try and understand potential discrepancies between the SSH-reported SES information and the information collected by the KHDSS. Finally, we will use simulations to assess how much errors in the reporting of SES information during SSH may bias estimates of the differences in adolescent and adult mortality rates between population sub-groups.

	Women	Men
Educational level		
None	72 (1.1)	31 (0.4)
Some primary	2,734 (40.0)	2,678 (35.6)
Completed primary	3,075 (45.0)	3,065 (40.8)
Secondary	930 (13.6)	1,712 (22.8)
Higher	21 (0.3)	35 (0.5)

Table 1: distribution of educational outcomes, by gender

Figure 1. Map of Karonga Health and Demographic Surveillance System

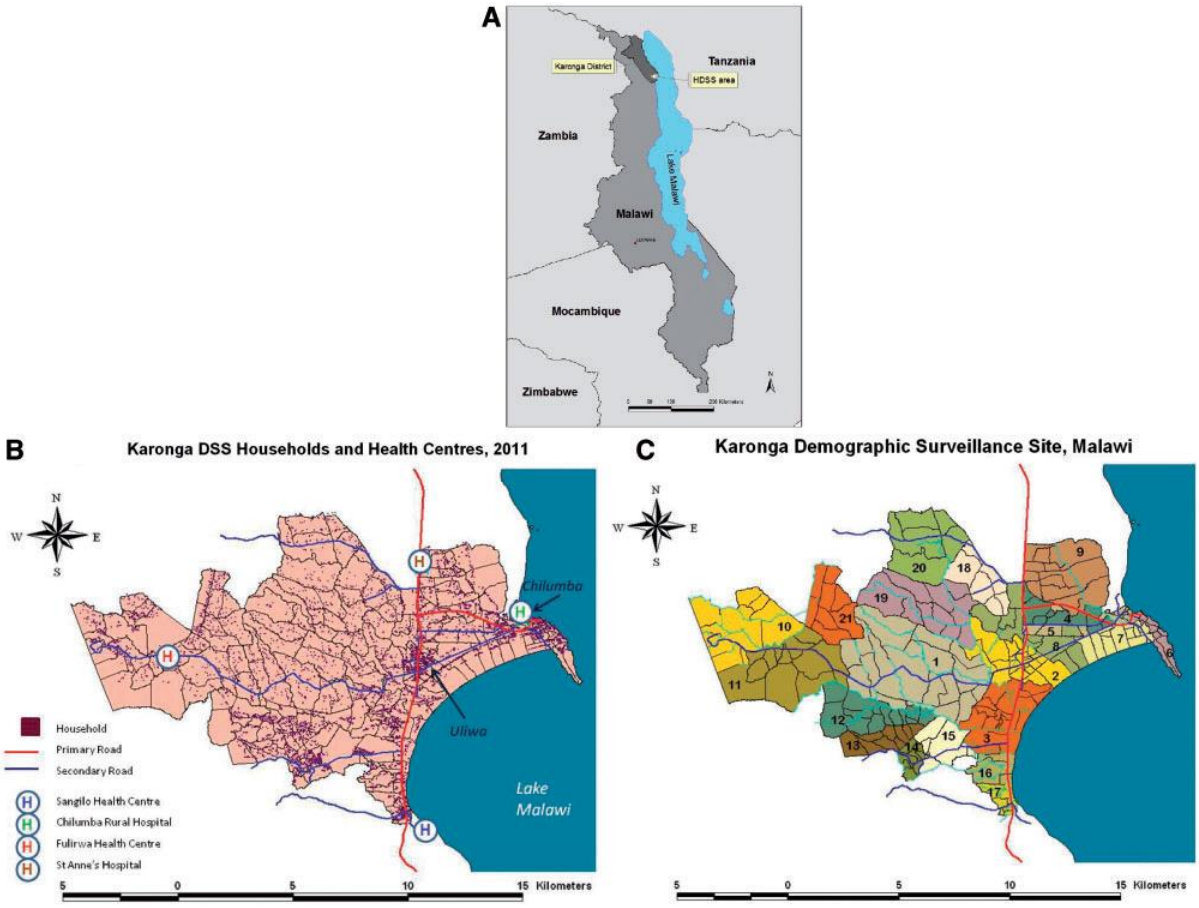

Figure 1 (A) Location of Karonga district and Karonga HDSS in Malawi; (B) map of Karonga HDSS showing household distribution, primary and secondary roads and location of health facilities; (C) map of Karonga HDSS showing cluster and reporting group boundaries [15].

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