Gender Differentials in Adult Mortality in Cameroon: A Pre-HIV/AIDS Assessment based on Parental Survival Data

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Introduction

The need to understand adult mortality is indisputable. Because it depletes the stock of human capital which is highly specialized, scarce and not easily replaceable, adult mortality may constitute a major obstacle to development efforts. Indeed, adults are the productive and reproductive forces of any society and in developing societies like Cameroon where social security and welfare schemes are lacking, they are very crucial for the wellbeing and survival of the young and the elderly. However, adult mortality remains poorly measured and little understood in Sub-Saharan Africa in general and Cameroon especially. Much less is known about the dimensions of differentials in adult mortality at the sub national level. Studying adult mortality differences provides a better understanding of potential risks associated with a particular subgroup membership and gives an indication of how and where mortality can be improved for the greater part of the population. In this light, an assessment of the extent and nature of geographical and social inequalities in adult mortality is valuable for health planners. It is useful for understanding demographic processes and making informed projections.

Social stratification results from unequal distribution of resources and/or opportunities in human societies. Studies have highlighted socioeconomic differentials in mortality and health that are of great concern (Elo and Preston 1999; Kitagawa and Hauser 1973; Marmot 2002; Palloni 2006; Preston 1976; Preston and Elo 1995; Preston and Taubman 1994; Rogers et al. 2000; Shkolnikov et al. 2004; Vallin 1995; Waldron 1995). Mortality and health differences by social classes are reportedly, strong at most ages, persistent over time, graduated across measures of social class, and pervasive across measures of global health (Marmot 2002; Palloni 2006). Among widely reported differentials in mortality, some of the most striking and persistently documented disparities related to men's and women's health and mortality. Indeed, it is well known that women generally outlive men in most populations around the world, though it may not be uncommon to find numerous exceptions in populations at every level of mortality (Preston 1976). While there are some commonalities, there are also differences as to magnitude in particular settings. In this paper, we explore the dimensions of sex differentials in adult mortality

by province of residence and where possible, how this relates to socioeconomic and demographic profiles of the regions. More specifically, the main focus is on whether the difference in survival chances by region and place of residence is in the same direction among men and women

Data and Methods

Measuring adult mortality is inherently more difficult due to the relative infrequency of cases. Thus large numbers of observations are required in order to obtain somewhat precise measures. Data used in this analysis come from the 1987 population and housing census of Cameroon. We propose to apply the orphanhood technique which allows for estimation of long term trends in mortality and relies solely on information gathered by the use of simple and easy-to-answer question(s). The idea of the demographic relationship between the proportion of orphans in a population and the mortality experiences of their parents was first described by Alfred Lotka (1939) who proposed to estimate the number of orphans from life table functions for adult survivorship. In a subsequent development, Louis Henry (1960) then recommended a reversal of this approach in order to estimate adult mortality from the number of orphaned children given knowledge of the underlying mortality and fertility schedules or assumptions about the underlying schedules. This idea was ultimately implemented and further developed by Brass and Hill (1973) to propose the orphanhood technique which allows for the estimation of life table survivorship probabilities from proportions of respondents in successive five-year age groups with mother or father alive based on a given set of weighting factors. The technique has been further refined and improved over the years by several scholars (Hill and Trussell 1977; Timeaus 1992; UN 1983).

The basic idea of the technique is that a particular target person is known to have been alive at the time of some past vital event (birth of the referenced individual for mother or conception in case of the father). As such, the age group of the respondents approximates the survival time of their parents from an average age of childbirth (or conception). Based on a similar logic and operationalization to the case of survivorship of children used for childhood mortality estimation, simple questions on the survival of a person's parents up to the time of the interview are used to compute well defined indicators of mortality outcomes along with the duration of exposure required to interpret them (Preston et al. 2001; UN 1983). Because the estimates usually refer to different retrospective time periods before the census, it is a useful

technique for providing trend estimates of mortality. Incidentally, Cameroon happens to have been among the first African countries to test the orphanhood question during the 1964 regional demography survey that covered the then Western part of the country.[1]

To estimate adult (fe)male, the proportions of persons in each 5-year age groups with fathers or mothers alive along with an estimate of the mean age of childbearing are required. For instance, for a group of persons aged x at time t who, at the time of their birth all had mothers who were aged y, the proportion of their surviving mothers at time t is given by the life table function l_{y+x}/l_y for the cohort of women born at time t-(y+x). Using the proportion of persons in a given age group with surviving mothers, the corresponding conditional probability of survival can be estimated as l_{M+x}/l_M, where M denotes the average age of mothers at the time of birth of the said persons and x denotes the mid-point of the age group. Because M may vary from one application to another, the probability can be expressed as a linear function of M and the proportion of persons with surviving mothers using a regression approach (UN 2002; 1983) so that:

$$l_{25+x} / l_{25} = a_0(x) + a_1(x)M + a_2(x)S(x-5,5), \qquad (1)$$

where S(x-5,5) denotes the proportion of persons aged x-5 to x whose mothers are surviving. The values $a_0(x)$, $a_1(x)$ and $a_2(x)$ obtained by regression on a set of model values of the three variables l_{25+x}/l_{25}, M, and S(x-5,5) are taken from Timaeus (1992, Table 3:56). Similarly but based on the assumption that husbands tend to be older than their wives, the estimate of adult male mortality is obtained as the survival probabilities conditional on reaching age 35 and the proportion for fathers is taken from two age groups rather than single age group.

$$l_{35+x} / l_{35} = a_0(x) + a_1(x)M + a_2(x)S(x-5,5) + a_3(x)S(x,5), \qquad (2)$$

where M denotes the mean age of fathers at birth of their children, S(x-5,5) the proportion of persons aged x-5 to x whose father is surviving and S(x,5) the proportion aged x to x+5 whose father is surviving. The two equations allow for the estimation of conditional survivorship probabilities which are the final outcome of the orphanhood method as was originally developed.

[1] Despite such early and promising attempts at using simple questions to gain insights on adult mortality, the inclusion of parental survival questions in many African censuses and surveys have been more frequently guided by the need to appraise the welfare of children and adolescents rather than the estimation of adult mortality. Consequently, an increasing tendency in recent surveys is to set an upper age limit of eligibility to the parental survival questions in keeping with UNICEF orientations and definitions of children.

The primary measures of adult mortality used in this analysis are the probability of dying between the ages 15 and 50 ($_{35}q_{15}$), between ages 30 and 65 ($_{35}q_{30}$) and the corresponding expected remaining years of life at age 5 (e_5). The corresponding life expectancy at birth will be presented for information. The overall picture confirms the general expectation that men have a shorter lease of life than women. The results show remarkable inter-gender differences in mortality and intra-gender patterns by regions. Sex differences in mortality rates are quite large in the more economically developed southern part whereas the gap in the Muslim-dominated northern part is not only small but suggests longer lives for men than women. Beyond these results, the study demonstrates the usefulness of these basic indirect techniques in enhancing knowledge on mortality patterns based on simple data that exist and/or can be easily collected in censuses and survey. This might also be helpful in the general assessment of these simple techniques for wider use while we look forward to the time when complete and functional vital registration systems will become available.

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