Mortality and the Wealth Gradient in Western Africa

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Background

In high-income countries, studies have found a 10+ year gap in life expectancy between the richest and poorest percentiles.[1,2] Mortality inequalities, defined as the differences in mortality rates between the rich and the poor in a country based on a measure of socioeconomic status, are costly, and are a major source of social inequality that can disrupt domestic and international stability.[3,4] However in Western Africa, we know little about the rates and trends in socioeconomic inequalities in mortality. The main reasons for this are a lack of high-quality data, a lack of data that link mortality and wealth, and few methodologies that can be applied under such constraints. We overcome these challenges by applying kinship methods to publicly available data. The aim of this study is to estimate age specific mortality rates by wealth quintile across Western Africa, over time, and to quantify differences between the highest and lowest wealth groups.

Methods

We used sibling survival data from the Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) from 2000 onwards for 15 of the 17 Western African countries, as defined by the United Nations Statistics Division: Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo (48 datasets). Data were not available for Guinea-Bissau or Saint Helena. The criterion for data inclusion was that the maternal mortality module was completed, which contains questions about sibling survival. Siblings were included for whom survival status was reported, who were between the ages of 15 and 49 during the specified study periods, or died between the ages of 15 and 49 during the specified study periods. Sibling wealth quintiles were assumed to be the same as those of the survey participant.

We estimated mortality rates by calculating the number of deaths by sex, age group, and wealth quintile, divided by the number of person years of exposure. We calculated mortality rate ratios by sex and age group for the lowest to highest wealth quintiles.

Preliminary Results

Preliminary analyses were conducted using 2019 DHS data from Sierra Leone and calculating mortality from 2012 to 2019. There were 63,982 siblings, of whom 48,834 met the criteria for inclusion. Of this group, 47,208 were alive in 2019, when the survey was conducted. The mean age of the study population in 2012 was 23.8 years. Table 1 details the characteristics of the study population of siblings.

For both men and women in the 15-24 age group, and for women in the 25-34 age group, those in the second lowest wealth quintile had the highest mortality rates. Among men in the 25-34 age

group, the mortality rate of those in the two lowest wealth quintiles overlapped, and were essentially equal. Among men aged 35-44, mortality rates followed the wealth gradient, with those in the lowest wealth quintile experiencing the highest rates, and those in the highest wealth quintile experiencing the lowest. Among women in the 35-44 age group, mortality rates also followed the wealth gradient, with the exception of the second lowest wealth quintile, which had the lowest mortality rates in this age group. Figure 1, Panels A and B illustrate these results.

The mortality rate ratio of lowest to highest wealth quintile was greatest for women aged 25-34; the poorest women had more than double the mortality rate of the wealthiest women in this age group. Table 2 details results of these analyses.

Discussion

It was unexpected that those in the second lowest wealth quintile would have the highest mortality for both sexes aged 15-24, and for women aged 25-34. It should be noted that this study period includes the Ebola epidemic of 2014-2016, which likely contributed to these results. These results show that the association between mortality and the wealth gradient is not always clear in Western Africa, and further research is needed in this area. The next step of this project will be to conduct the same analyses on all relevant DHS and MICS datasets, and to identify drivers of mortality inequality.

Table 1. Characteristics of study population

Total number of siblings	48,834
Female	24,937
Male	23,897
Mean age in 2012	23.8 years
By wealth quintile	
Poorest (1)	9,700
Poorer (2)	9,632
Middle (3)	10,067
Richer (4)	10,852
Richest (5)	8,583
Alive at time of survey	47,208

Table 2. Mortality rate ratio of lowest to highest wealth quintiles

Sex	Age group	Mortality ratio
Female	15-24	1.43
	25-34	2.16
	35-44	1.24
Male	15-24	1.45
	25-34	1.72
	35-44	1.43

Figure 1, Panel A. Female adult mortality rates per 1,000 by age group and wealth quintile, 2012-2019, Sierra Leone.

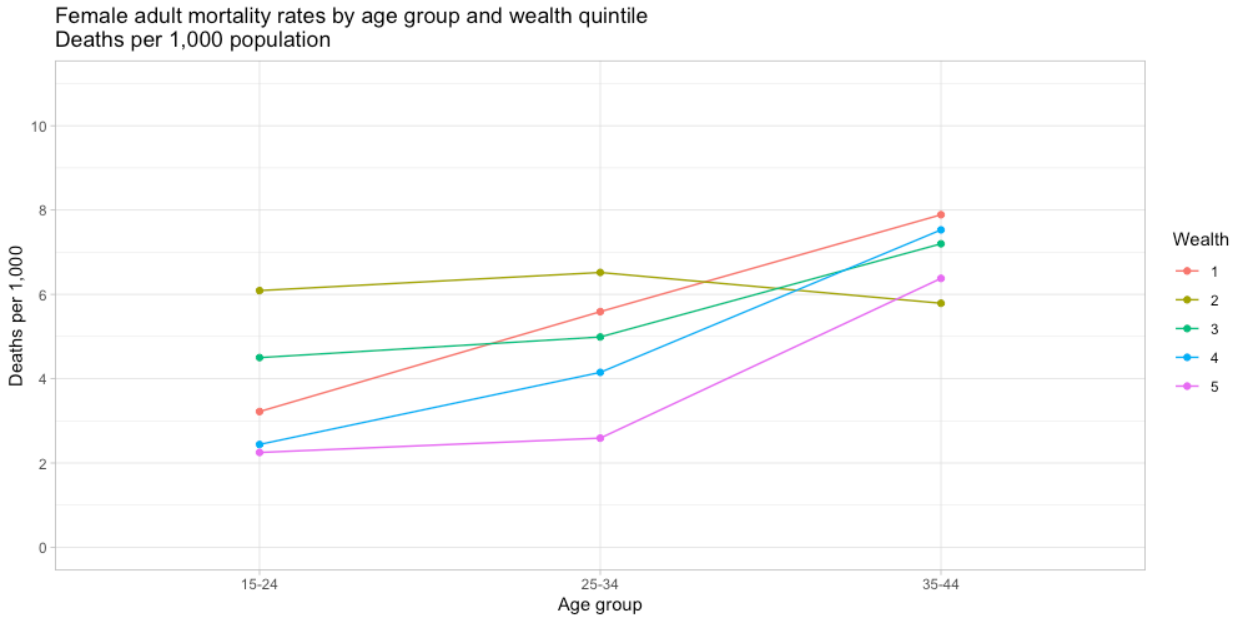
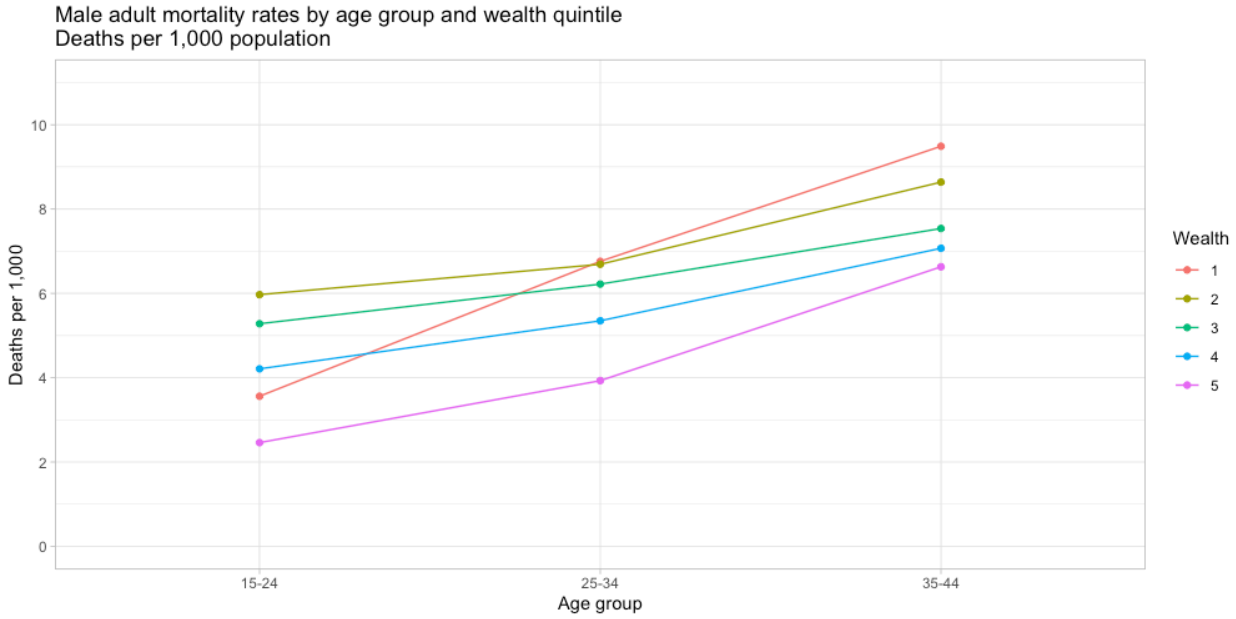


Figure 1, Panel B. Male adult mortality rates per 1,000 by age group and wealth quintile, 2012-2019, Sierra Leone.



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