

Reconstructing age-specific mortality in India using data with pronounced age heaping from DLHS and NFHS

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This is a work in progress

Adult mortality is a growing health concern in India. The country's progress in reducing adult deaths in recent decades was moderate. Therefore, reliable mortality estimation across the entire range of ages is a priority.

One of the major obstacles researchers face in studying adult mortality in India is the absence of a fully functioning nationwide vital registration system. Traditionally, estimates of mortality and life expectancy in India were based on the intercensal survival method. Indirect techniques (especially the death distribution methods) are still being used for evaluating and correcting mortality data coming from the demographic data collection systems.

These systems provide direct data age-specific deaths and population exposure annually. In order to produce continuous demographic and mortality data, the Office of the Registrar General of India maintains since 1970 a nationwide Sample Registration System (SRS). In present, this system covers nearly eight million people. Large nationwide surveys like the National Family Health Survey (NFHS) and the District Level Household Survey (DLHS) present an additional source of data on mortality. They cover two to three million people. Importantly, apart from the age and sex information, they provide economic and socio-demographic characteristics of households and individuals.

Our previous studies on mortality in India revealed some differences between the SRS and NFHS mortality curves. While the NFHS death rates are higher at young adult ages, SRS death rates are higher at ages 50+. We have found also that at older ages the SRS death rates increase at a steeper pace compared to what is predicted by the Gompertz law.

This study looks at the NFHS and DLHS data from 2003-4 to 2014-15 as a source for estimating mortality. In both surveys, death counts are based on information about deaths of household members taken place within two years before the interview. Correspondingly, the population exposure is also calculated for the two-year period preceding the interview.

The age-specific death and population counts are strongly affected by the age heaping. The age heaping increases with age. Although the heaping is lower in households with a higher level of the maximum household's member education, it is very pronounced even in such households. At ages above 50, age heaping is stronger for deaths than for population. The major age heaping is around ages ending by 0 and 5. There is also a weaker age heaping around ages ending by 2 and 8.

We applied a strong smoothing procedure on the cumulative population and death counts at ages 15 to 64. Then we computed the five-year age-specific death rates from the smoothed data and from the original data. For comparisons, we used contemporary SRS death rates as well as contemporary UN death rates.

We plan to work out an optimal procedure through experiments with smoothing/fitting population and deaths as well as modeling the mortality curve.