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**Estimates of mortality under age 60 in  
India and its states, 1970-2004**

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# **Estimates of mortality under age 60 in India and its states, 1970-2004**

## **MPIDR Technical Report**

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### ***Abstract***

In this report, we provide uniformly calculated measures of mortality under age 60 in India and its 16 major states for the period 1970-2004. The mortality estimates are calculated using the data from the Sample Registration System of India (SRS). Evaluation of the SRS data quality confirms reliability of these data for children and adults under age 60. The report provides the time series of the following life table-based measures: probability of dying between exact ages 0 and 15, probability of dying between exact ages 15 and 60, and temporary life expectancy between exact ages 0 and 60.

Keywords: mortality, trends, regional mortality differences, India

## **Introduction**

The lack of studies on mortality in developing countries can be explained by several specific problems related to the registration of deaths and estimation of population exposure. In general, reliable mortality statistics require fully functioning vital registration systems. The registers ensuring good coverage of vital events are missing in India (Malaker, 1986; Bhat, 1987). Retrospective demographic and health surveys are seen as a reasonable alternative for measuring mortality. However, these surveys often provide reliable information only about infant and child mortality, whereas obtaining information about adult deaths is problematic.

The present report is based on data and methodology that are described in detail elsewhere (Saikia et al., 2009). It provides mortality estimates for a broad range of child and adult ages for the whole of India and for its sixteen major states calculated from data of the Sample Registration System (SRS), the major source of representative and the most complete data on mortality in India.

## **Data source**

We use the SRS data on age-specific probabilities of dying published by the Registrar General of India (ORG, 1984, 1985, 1989, 1994; RGI, 1998, 2004, 2007). The SRS is based on a dual record system. It involves continuous enumeration of births and deaths in a sample of villages/urban blocks by a resident (part time) enumerator. In addition, at the end of each six months period, a retrospective survey is being conducted by a full time supervisor. The data obtained through these two sources are matched (Bhat, 2002; RGI, 2007). More information about both the specific of the SRS design and input data can be found in the official publications by the Registrar General of India (ORG, 1984, 1985, 1989, 1994; RGI, 1998, 2004, 2007). In this report we provide mortality estimates for the following periods: 1970-1975, 1976-1980, 1981-1985, 1986-1990, 1991-95, 1996-2000 and 2000-2004.

## **Data quality**

The coverage of the SRS is found to be generally high (Saikia et al., 2009). Although other data quality problems such as age misreporting are common in India (Bhat, 1987), prior studies had shown that population age distributions based on the SRS data are more reliable than the census data (Bhat, 1987). At the same time, there are vary serious data quality problems at ages beyond 60 (Saikia et al., 2009).

Comparisons between the SRS and alternative sources of similar data (National Family Health Survey) suggested that the SRS estimates are likely to be accurate for child and adult ages. Thus, it was assumed that restricting the range of ages to ages from 0 to 59 would allow to avoid significant biases. We believe that the provided mortality estimates describe the major regularities of variation in the Indian mortality across time and state correctly (Saikia et al., 2009).

## Methods

### *Life table measures*

Life table measures are constructed using Chiang's algorithm (Chiang, 1984). Age-specific probabilities of dying by the Registrar General of India were used as input data (ORG, 1984, 1985, 1989, 1994; RGI, 1998, 2004, 2007).

Temporary life expectancy ( ${}_y e_x$ ) from age  $x$  to  $y$  is the expected length of life between exact ages  $x$  to  $y$  (Arriaga, 1984). We calculate the temporary life expectancy between exact ages 0 and 60 as:

$${}_{60}e_0 = \frac{T_0 - T_{60}}{l_0}$$

where  $l_0$  is the radix of the life table,  $T_0$  and  $T_{60}$  are the number of person-years lived after ages 0 and 60, respectively. The temporary life expectancy can be considered as an aggregate measure of mortality at ages under 60.

In addition, we calculate probabilities of death between exact ages 0 and 15 and between exact ages 15 and 60 to highlight mortality levels at child and adult ages, respectively

$${}_{15}q_0 = \frac{l_0 - l_{15}}{l_0}, \quad {}_{60}q_{15} = \frac{l_{15} - l_{60}}{l_{15}}.$$

## List of Excel files:

### **TEMP\_LE.xls**

This file includes male and females temporary life expectancies between exact ages 0 and 60 for India and its 16 major states, 1970-2004.

### **q0-14.xls**

This file includes male and females probabilities of dying between exact ages 0 and 15 for India and its 16 major states, 1970-2004.

### **q15-59.xls**

This file includes male and females probabilities of dying between exact ages 15 and 60 for India and its 16 major states, 1970-2004.

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