Socioeconomic disparity in adult mortality in India: Estimations using the Orphanhood method

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Background

- Advent of Demographic and Health Surveys (DHS) in developing countries and Under five mortality studies
- Studies on SES gradients in adult mortality are exceptionally less in these countries
- Lack of Civil Registration System data
- Lack of enough sample size in DHS data

However,

- Most developing countries are experiencing an unprecedented decline in mortality in the under-fives, with most premature deaths shifting to the adult age group.

- Secondly, the determinants and causes of adult mortality differ substantially from those of under-five mortality, as do SES disparities in adult mortality with regard to its extent and main causes.

- Thirdly, unlike self-reported health or morbidity, which suffer from reporting bias by socioeconomic characteristics (Dowd and Todd, 2011), the mortality indicator is still the most objective measure for documenting social disparity in adult health

What is known about SES and adult mortality in developing countries and in India?

- By applying indirect demographic methods such as the Sibling Survival Method (Bicego, 1997; Gakidou and King, 2006; Obermeyer et al., 2010), the Orphanhood Method (Blacker, 1977; Timaeus, 1991; Timæus and Jasseh, 2004), the Widowhood Method (Malaker, 1986; Saikia et al., 2013) or other census-based methods (Bhat, 1998; Bradshaw and Timaeus, 2006); .

- By analyzing official statistics on adult mortality wherever available (Queiroz et al., n.d.; Saikia et al. 2011; Joubert et al., 2013; Ram et al., 2015; Zhao et al., 2016);

- By using longitudinal data from Demographic Surveillance Systems (DSS) or large cross-sectional sample surveys (Barik, Desai, & Vanneman, 2016; Belon, Barros, & Marín-León, 2012; Luo & Xie, 2014; Nikoi & Odimegwu, 2013)

Objectives

- In the present study, we aim to extend this literature by investigating disparities in adult mortality by SES in India.

- To our knowledge, this is the first study to investigate adult mortality rate and adult life expectancy in India by distinct social characteristics.

- Moreover, our study is the first to use the Orphanhood method to estimate the adult mortality rate in India.

Data source: India Human Development Survey, 2011-2012

- We used data from the second round of the India Human Development Survey (IHDS), 2011–2012, conducted by researchers from the University of Maryland, USA, and the National Council of Applied Economic Research (NCAER), New Delhi, India

- The IHDS II is a nationally representative, multi-topic survey of 42,152 households in 1,503 villages and 971 urban neighborhoods across India

- We used information available through the eligible women questionnaire. An eligible woman is defined as a woman aged 15-49 who has ever been married (an ever-married woman). These women were asked about the survival status of their biological parents, including their parents' highest educational qualification.

Measures of Socio-economic Status (SES)

- **Literacy status** of the deceased adults (Illiterate and Literate);
- **Caste of** the offspring (General Castes, Other Backward Castes, Scheduled Castes, and Scheduled Tribes);
- **Religion** of offspring divided into majority (Hindu) and non-majority (non-Hindu) religion;
- **Educational attainment** of the offspring (Illiterate, Primary School, Secondary School, and Higher-Secondary and above); and
- **Per annum family income** of the offspring (less than 50,000 INR; 50,000–100,000 INR; and more than 100,000 INR).

Orphanhood Method

- The “Orphanhood” method focuses on whether the mothers and fathers of the survey respondents are still alive at the time of the interview.

- The exact questions needed i) *“Are your parents still alive?” and ii) “How many standards/grades did your parents complete?”*

- The proportion of respondents with mother and father alive is then transferred into a period survival probability from age 25 to age 25 plus a rounded number of years (n) based on the age group of the respondents (l_{25+n}/l_{25})(Moultrie et al., 2013)

Assumptions

- First, that the mortality of parents is not correlated with the mortality of their children. The selection bias arising from this assumption is small (Palloni et al. 1984) unless the general population is affected by HIV epidemics.

- Secondly, To convert the series of measures of survivorship obtained from different age groups into a single indicator, it must be assumed that the age pattern of mortality in adulthood is represented by a standard life table.

- As the underlying mortality levels and patterns are unknown in developing countries, the transformation is based on theoretical population models

Results

Figure 1. Percentage of respondents by age with mother/father dead, IHDS 2011-2012

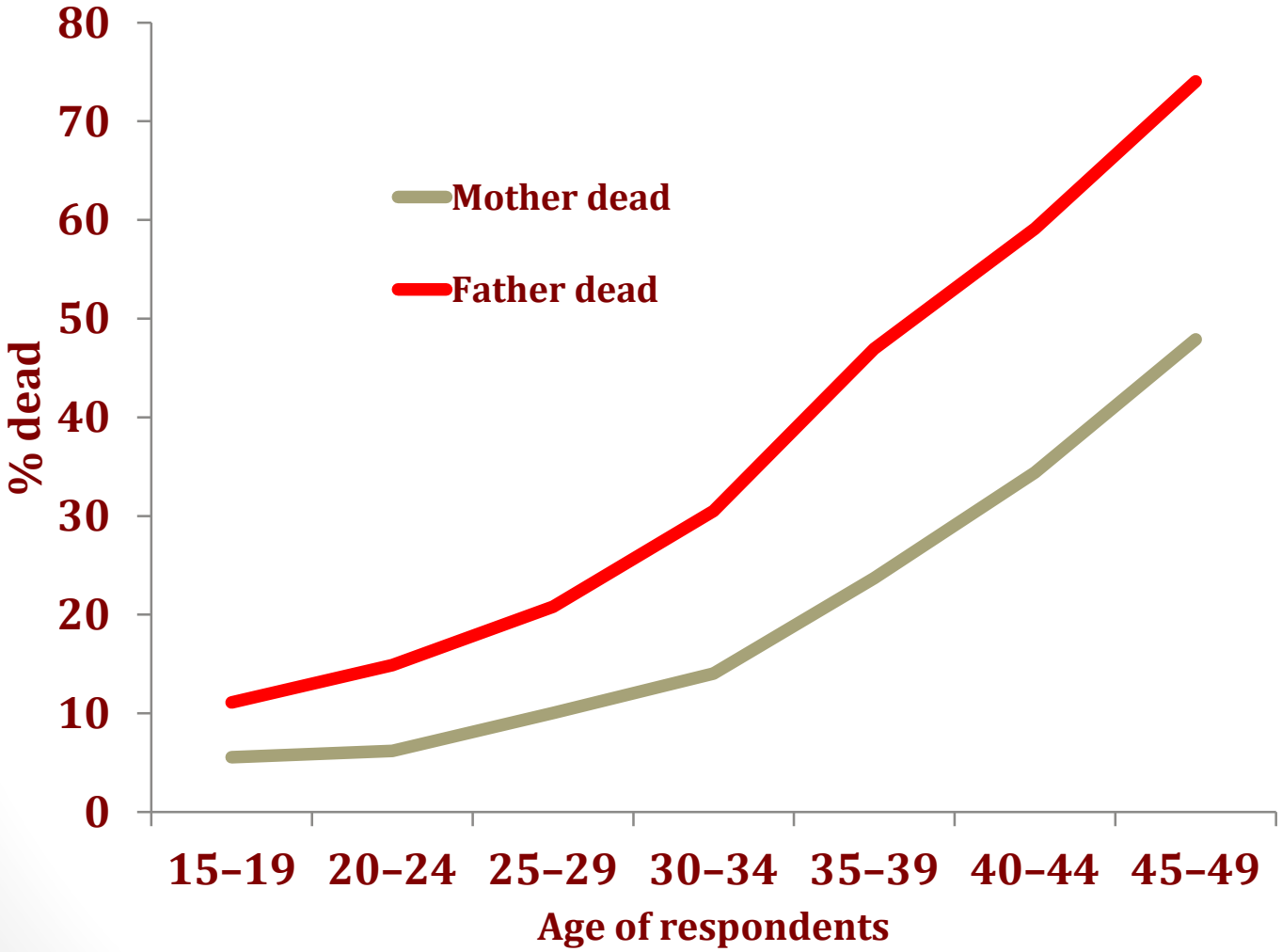


Figure 2:Percentage of respondents aged 15-49 with mother/father dead by socioeconomic status, IHDS, 2011-2012, India

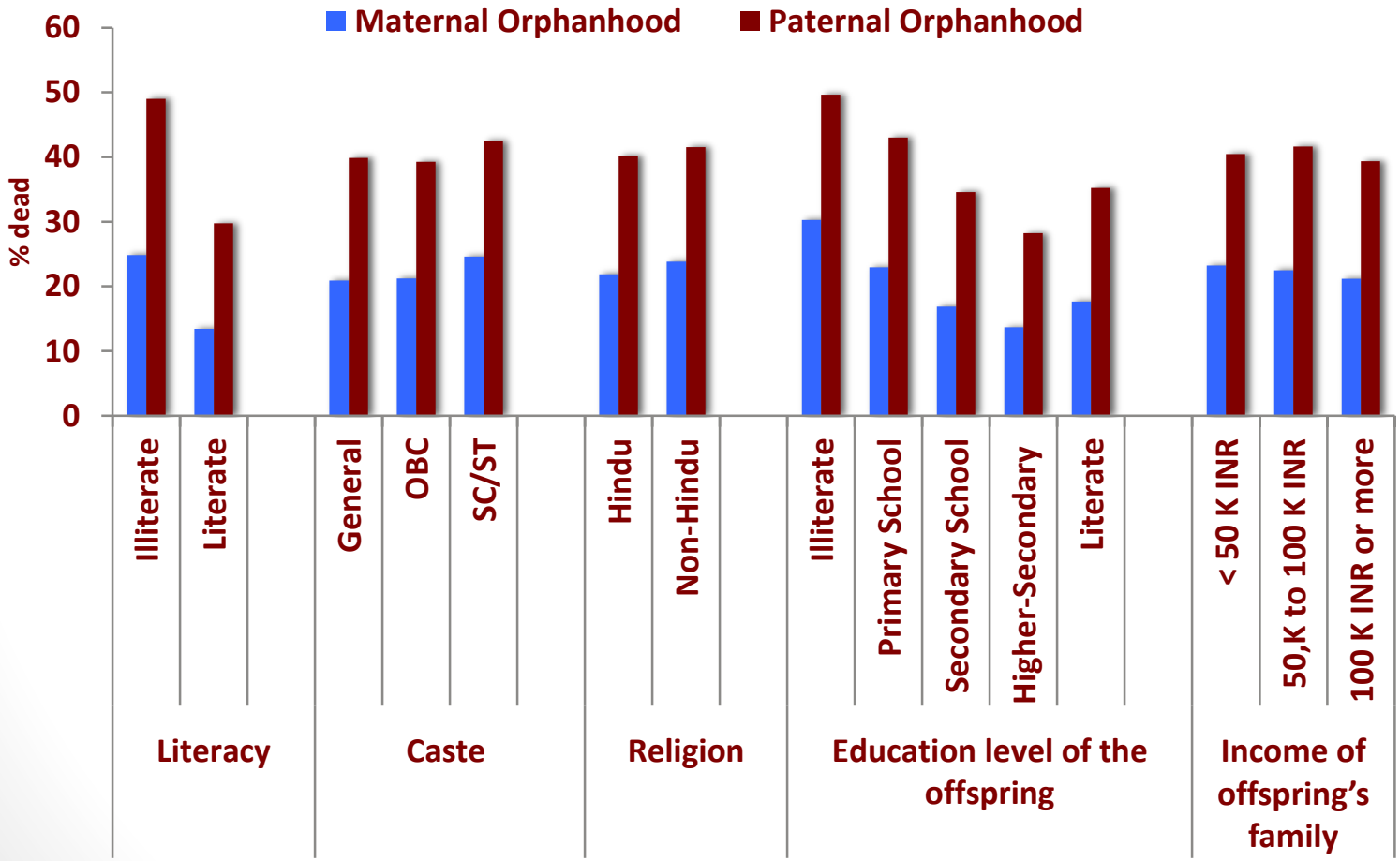
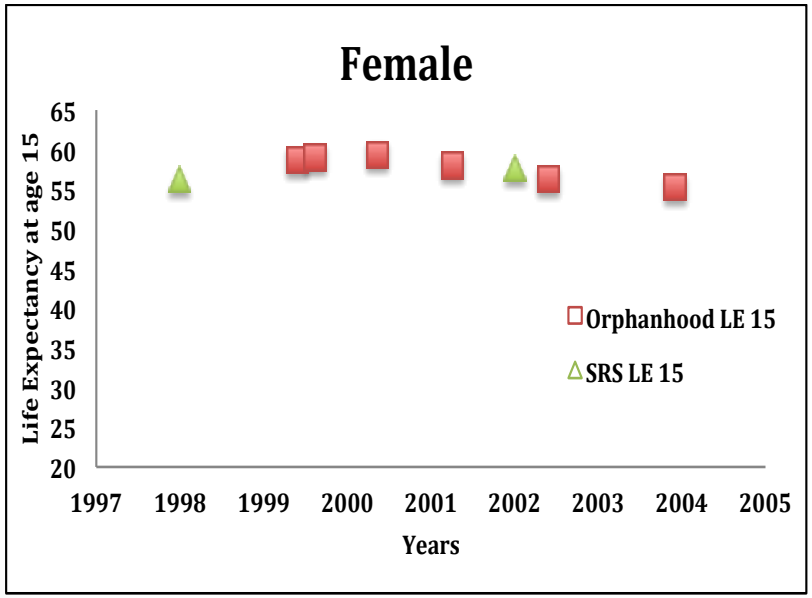


Figure 3: Comparison of life expectancy at age 15 by sex from Sample Registration System and Orphanhood estimates, IHDS, India 2011-2012



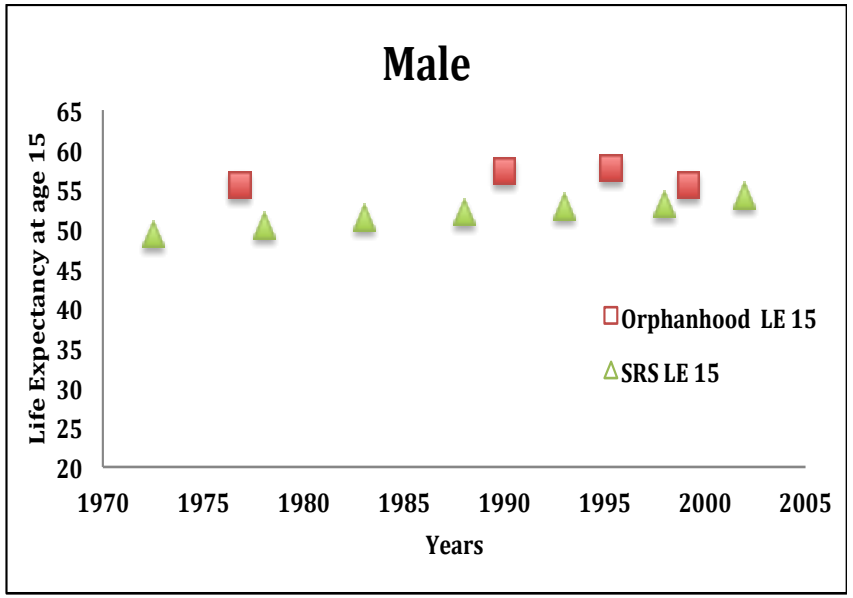
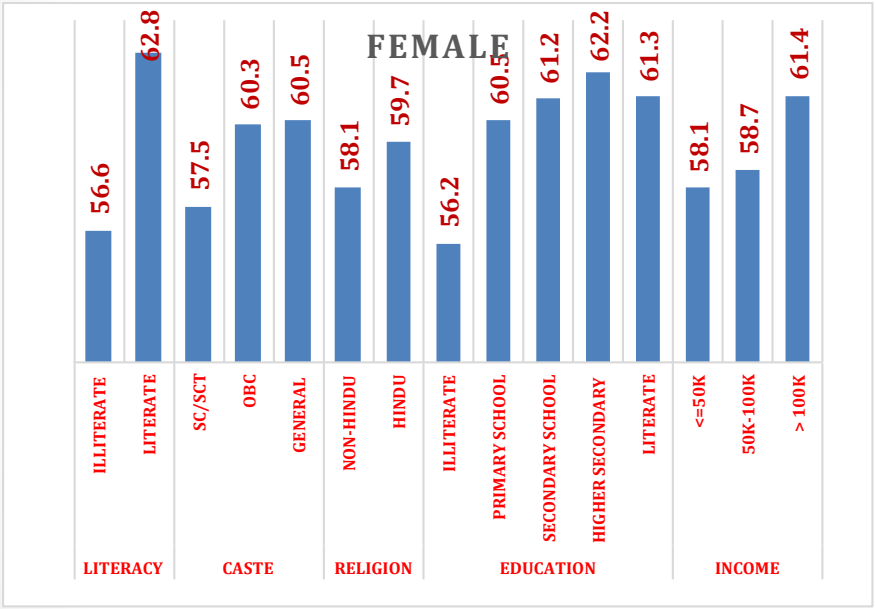
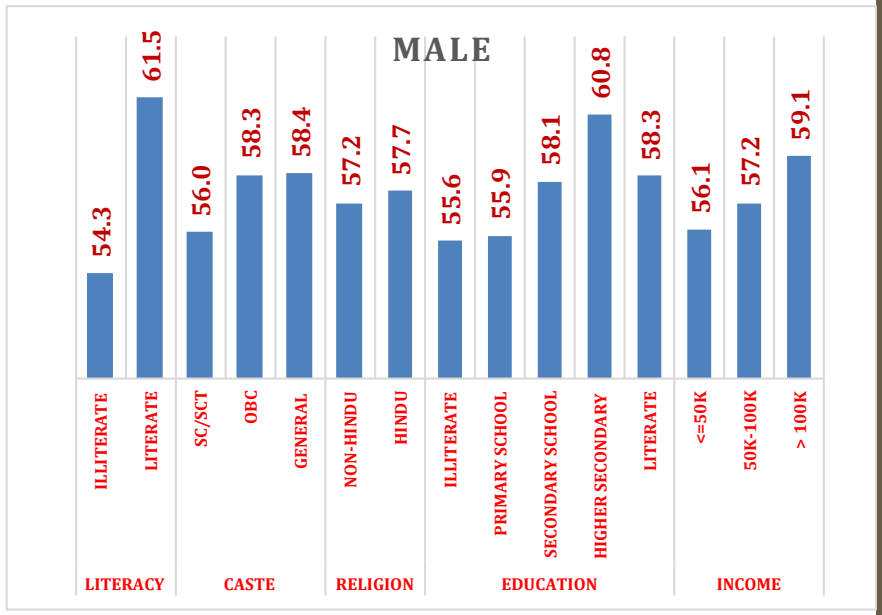


Table 1. Male and female $_{45}q_{15}$ (per 1,000 adults) by socioeconomic status, India

	Female, Ca 2001 45q15	Ratio	Male, Ca, 1995 45q15	Ratio
Educational level of parents				
Illiterate	176.1	2.117	228.4	1.96
Literate®	83.2		116.3	
Caste				
SC/ST	161.6	1.41	209.8	1.26
Other backward classes	116.3	1.02	167	1.00
General ®	114.3		166.3	
Religion				
Non-Hindu	150.2	1.20	187.2	1.05
Hindu®	125.3		178.5	
Education level of the offspring				
Illiterate	184.5	2.03	201.9	1.59
Literate	102.7	1.79	168.2	1.20
Up to Primary School	114	1.25	212.1	1.67
Secondary School	103.4	1.14	171.6	1.35
Higher-Secondary and above®	91.1		127	
Income level of offspring				
Less than 50K	150.7	1.48	207.3	1.35
50K-100K	140.5	1.38	187.3	1.22
More than 100K	101.8		154	
Total	128. 7		179. 9	

Figure 4 . Female and male life expectancy at age 15 by socioeconomic status, India, female ca. 2001 and male ca.1995





Discussion

- Though higher SES universally leads to lower adult mortality, the magnitude of socioeconomic disparity varies immensely from one population to another (Caselli et al. 2017) or from one socioeconomic indicator to another within the same population

- In this paper, we have aimed to fill some of these knowledge gaps with regard to the population of India

- The findings of our study confirm that adult mortality varies markedly by SES measured both by adults' own SES and the SES of their offspring.
- Disparities in adult mortality appear to be highest in terms of the educational attainment of respondents or their children.

Limitations

- First, although the sample analyzed is a nationally representative sample, the size of the sample is not large enough to allow a detailed analysis of each category. In this paper, we have aimed to fill some of these knowledge gaps with regard to the population of India

- Secondly, as indirect estimation techniques provide retrospective estimates for a specific time before the survey was carried out, our mortality estimates refer approximately to the years 1995 and 2001.
- Finally, despite IHDS being a large sample survey representing the national population, the adult mortality rates presented here are representative only of adults with married daughters.

Thank You

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