



# Economic Status and Adult Mortality in India: Is the Relationship Sensitive to Choice of Indicators?



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## SUMMARY

Research on economic status and adult mortality is often stymied by the reciprocity of this relationship and lack of clarity on which aspect of economic status matters. While financial resources increase access to healthcare and nutrition and reduce mortality, sickness also reduces labor force participation, thereby reducing income. Without longitudinal data, it is difficult to study the linkage between economic status and mortality. Using data from a national sample of 132,116 Indian adults aged 15 years and above, this paper examines their likelihood of death between wave 1 of the India Human Development Survey (IHDS), conducted in 2004–05 and wave 2, conducted in 2011–12. The results show that mortality between the two waves is strongly linked to the economic status of the household at wave 1 regardless of the choice of indicator for economic status. However, negative relationship between economic status and mortality for individuals already suffering from cardiovascular and metabolic conditions varies between three markers of economic status—income, consumption, and ownership of consumer durables—reflecting two-way relationship between short- and long-term markers of economic status and morbidity.

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## 1. Introduction

The correlation between economic status and health has been extensively documented at both macro and micro levels (Deaton, 2002; Kitagawa, 1973; Preston, 1975). However, research seeking to understand the causal relationship between the economic status of individuals and mortality faces three serious challenges: (1) Economic status tends to be a loosely defined term that is variously operationalized as income, occupation, wealth, ownership of assets, and consumption by different studies, frequently because data availability dictates the choice of measures (Bollen, Glanville, & Stecklov, 2001). However, as we discuss below, these distinctions are conceptually meaningful, but little attention has been paid to whether the relationship between economic status and mortality is sensitive to choice of indicators (2) Economic status and health do not have a unidirectional relationship, making it difficult to model these relationships with cross-sectional data. Poverty may lead to poor health, but illness may also reduce income. Thus, longitudinal studies can help to untangle this relationship. (3) Economic status may affect health outcomes both positively and negatively. Much of the research in this area has tended to focus on the beneficial impact of economic status on health outcomes, while overlooking potentially negative influ-

ences. This issue is particularly relevant in transitional societies where health limitations associated with obesity and lack of physical activity tend to disproportionately affect the rich, creating what has been called “double burden” of malnutrition (Ramachandran, 2016).

In this paper we examine the link between the economic status of 132,116 Indian adults ages 15 and above in 2004–05 and the likelihood of their death by 2011–12. Using prospective data from a unique household survey, the India Human Development Survey (IHDS) allows us to address some of the challenges described above in order to examine the extent to which economic status offers protection against death for Indian adults. The IHDS data are particularly well-suited to this analysis because they collect information at an earlier point in time on both different markers of economic status and whether individuals suffer from major diseases. The second interview, conducted seven years later, provides the information about the survival status of these individuals.

## 2. Conceptual challenges

Studies linking economic status to mortality must address three crucial questions in order to develop appropriate analytical strategies:

### (a) What constitutes economic status?

Although economic status forms the core of demographic research on individual well-being, few studies critically reflect on indicators of economic status they use and what these indicators measure (Bollen et al., 2001). Data limitations often force researchers to make choices that provide good approximations of the relative economic ranking of households suitable for studies where economic status is simply a control variable. However, this strategy is inadequate when economic status is the primary variable of interest. Three commonly used markers of economic status—income, consumption expenditure, and wealth or asset ownership—tap into three different dimensions of economic status.

#### (i) Income

Income from wages, self-employment, government transfers, and rents or dividends, forms the core on which households build their lifestyles. In societies where most of these incomes are received in cash, data on income are routinely collected and feature prominently as independent or control variables in studies of individual well-being. However, as we consider income fluctuations within a life cycle perspective, limitations of focusing on cross-sectional measures of income become quickly apparent (Modigliani & Brumberg, 1954). Income is rarely stable across the life course with most income being concentrated in adulthood while children are supported by their parents and older individuals rely on savings or support from other family members or government (Lee & Mason, 2011). Moreover, income also tends to fluctuate considerably from year to year, particularly in agricultural societies where vagaries of weather lead to substantial crop variations.

Income data may also contain considerable measurement error (Deaton, 1997). In societies characterized by high degree of self-employed (e.g. agriculture or petty business), it is necessary to obtain detailed data on inputs and outputs to calculate net income. It is also possible, that high income households may understate their incomes.

#### (ii) Consumption

Potential discrepancy between short-term fluctuations in income and longer term needs of families for a stable life-style led Friedman (1957) to distinguish between permanent and transient components of income. This distinction led to arguments that household consumption is more closely related to permanent income and less susceptible to income volatility (Friedman, 1957) so that consumption expenditures have become the favored indicator of household economic status in research on developing countries (Grosh & Glewwe, 2000). Although less volatile than income, consumption expenditures also could easily spike in a given year, for example when large medical emergencies take place. Moreover, research in India has shown that consumption data are sensitive to reference period for data collection (Sen, 2000).

#### (iii) Assets

Wealth is a third measure often used to measure household economic status (OECD, 2013). Households that own large amounts of wealth but have low current income can easily borrow against this wealth to finance day-to-day living. Real estate, savings, stocks, and bonds typically get counted as wealth in rich societies. However, in poor countries, non-liquid wealth in the form of ownership of consumer durables and housing has been used quite profitably as a measure of household economic status by many researchers (Bollen et al., 2001; Filmer & Pritchett, 2001; Montgomery, Gragnolati, Burke, & Paredes, 2000). Montgomery et al. (2000) find that while the standard of living measured by

ownership of household assets is weakly correlated with consumption expenditure per adult in any given year, assets are strong enough “proxies” when it comes to predicting outcomes of demographic interest. However, a number of weaknesses of these asset-based measures should be noted. First, asset indices are sensitive to household size and do not take into account economies of scale. Second, in some settings, many items in this index may be acquired through gifts or major life transitions, e.g. in India it is common to give a TV as dowry. Thus, they may reflect income or consumption from own resources poorly but nonetheless provide assets that households may use to finance expenditures. Finally, as Montgomery et al. note, some of the items often included in these indices may have an effect on mortality independent of their significance for economic status (e.g., clean tap water, toilets, electricity, transportation).

Each of these three markers of economic status reflects a different life-cycle process. Income is most vulnerable to short-term fluctuations of the three while assets, often treated as markers of wealth, are the most long-term since they are accumulated over a lifetime. Consumption expenditures form a medium-term measure of economic status—households may save during periods of unexpected windfall income to spend during periods of economic stress, but over time if the windfall or shortfall in income becomes more or less stable, life-styles may be adjusted to incorporate these into permanent incomes. Thus, selection of an indicator to measure economic status must depend on whether we see the relationship between economic status and mortality operating in short, medium or long term.

### (b) How can we address potential biases due to reverse causality?

It has long been recognized that poverty is associated with ill-health (Deaton, 2002). In England and Wales, the systematic documentation of mortality by occupational class began as early as 1851, with the publication of Decennial Supplements to the Annual Report of the Registrar General. Social class differentials in mortality became the focus of systematic study in the United States only in the latter half of the twentieth century, with the publication of Kitagawa and Hauser's path-breaking study of demographic and socio-economic mortality differentials. This study was based on the 1960 Census matched to death certificates filed in May–August of the same year (Hummer, Rogers, & Eberstein, 1998; Kitagawa, 1973). Although there exists ample literature on the nexus between socio-economic status and health and mortality in Western societies, research on this issue in an Asian context gained prominence only in the 1990s (Chen, Yang, & Liu, 2010; Liang et al., 2000; Liu, Hermalin, & Chuang, 1998; Saikia & Ram, 2010; Zimmer, 2008; Zimmer & Amornsirisomboon, 2001; Zimmer, Kaneda, & Spess, 2007; Zimmer, Martin, Ofstedal, & Chuang, 2007).

One of the challenges faced by literature in this area emerges from the possibility of reverse causation. Poor health may restrict an individual's capacity to earn income and accumulate assets by limiting work or by raising medical expenses. In his pioneering article titled *Healthy Bodies and Thick Wallets*, James P. Smith (1999) concluded that the causal direction of the relationship between income and health is not uniform across the life-cycle. During the pre-retirement period, health affects income, whereas for older individuals, income affects health. In recent decades, several studies have tried to address challenges of reverse causality in research located in developed countries (Case & Paxson, 2011).

However, in extending this work to developing countries, we encounter an additional challenge. Economic status may be measured via a variety of indicators such as income, consumption expenditure, and ownership of assets (Deaton, 1997). Several studies have tried to find ways to find easy measures of economic status without having to engage in extensive data collection (Filmer &

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