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# The importance of wage loss in the financial burden of illness: Longitudinal evidence from India

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ABSTRACT

*Background:* A key aim of Universal Health Coverage (UHC) is to protect individuals and households against the financial risk of illness, and large-scale health insurance expansions are a central focus of the UHC agenda. Importantly, however, health insurance does not protect against a key dimension of financial risk associated with illness: forgone wage income. In this paper, we quantify the economic burden of illness in India attributable – separately – to wage loss and to medical care spending, as well as differences in them across the socio-economic distribution.

*Methods:* We use data from two longitudinal Indian household surveys: (i) the Village Dynamics in South Asia (VDSA) survey (1300 households surveyed every month for 60 months between 2010 and 2015) and (ii) the Indian Human Development Survey (IHDS) (more than 40,000 households surveyed in 2005 and again in 2011). Our regression models include a series of fixed effects that account for time-invariant household- (or individual-) level and time-varying unobservables common across households.

*Findings:* We find that, in the VDSA sample, wage loss accounts for more than 80% of the total economic burden of illness among the poorest households, but only about 20% of the economic burden of illness among the most affluent. Estimates from the IHDS sample confirm that this socio-economic gradient is present in the Indian population generally.

*Conclusions:* Wage loss accounts for a substantial share of the total economic burden of illness in India – and disproportionately so among the poorest households. Our findings imply that if UHC is to achieve its objective of protecting households against the financial risk of illness – particularly poor households, the inclusion of wage loss insurance or another illness-related income replacement benefit is needed.

## 1. Introduction

A central aim of Universal Health Coverage (UHC) is to protect individuals and households against the financial risk of illness – with particular emphasis on poor, vulnerable, and marginalized segments of the population (UNGA, 2019). This goal is supported by a substantial body of evidence estimating that nearly 100 million people worldwide are pushed into extreme poverty each year because of out-of-pocket spending for unanticipated medical care needs (WHO and World Bank, 2017). The rise in non-communicable diseases (NCDs) is pushing these estimates higher (Bukhman et al., 2020), and the SARS-CoV-2 pandemic is presumably as well. Globally, India – the focus of this paper – accounts for nearly half of those impoverished due to illness, and illness is a leading cause of indebtedness and poverty (Balarajan et al., 2011; Garg and Karan, 2009; Ghosh, 2011; Keane and Thakur, 2018; Shahrawat and Rao, 2012). Large-scale health insurance expansions in India, and in low- and middle-income countries generally, are therefore a central focus of the UHC agenda (Hooda, 2020; La Forgia and Nagpal, 2012; Patel et al., 2015; Reddy et al., 2011; Tangcharoensathien et al., 2011).

Importantly, however, health insurance does not protect against the other key dimension of financial risk associated with illness: wage loss. In many high-income countries, health and wage loss (or short-term disability) insurance exist in tandem to protect against both forms of

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risk (Mont, 2004; OECD, 2010, 2003; Paris et al., 2016). In lower-income countries, wage loss insurance or illness-related income replacement benefits are often absent, meaning that for every day a working individual is sick and unable to work, that individual is not paid (and coverage of existing programs often excludes informal workers) (Thorpe et al., 2020). This concern applies disproportionately to the poor, who are more likely to be day-laborers (without sick leave) rather than salaried employees.

Nonetheless, the extent to which wage loss due to illness is an important source of economic burden in lower-income countries – and its magnitude relative to out-of-pocket medical spending – is largely unmeasured. A large body of research documents a substantial economic burden of illness among households in India and in low- and middle-income countries generally (Alam and Mahal, 2014; Gheorghe et al., 2018; Jan et al., 2018; Kankeu et al., 2013). However, this research has largely focused on out-of-pocket medical spending (Engelgau et al., 2012; Karan et al., 2014; Mahal et al., 2010; Xu et al., 2003, 2007), with limited evidence on wage loss (Alam et al., 2018; Beegle, 2005; Gertler and Gruber, 2002; Wagstaff, 2007; Yamano and Jayne, 2004). One systematic review concludes that the economic burden of illness due to wage loss is unclear, with some studies suggesting no effect at all (Thorpe et al., 2020). Moreover, few studies have explicitly considered the relative size of wage loss and out-of-pocket medical spending (the two major components of financial risk associated with illness) (Gertler and Gruber, 2002; Mahal et al., 2010; Mitra et al., 2016; Neelsen et al., 2019; Tanimura et al., 2014; Wagstaff, 2007) – nor differences in them across the socio-economic distribution (Ettling et al., 1994).

In this paper, we quantify the relative importance of wage loss and medical spending associated with illness, as well as variation in their relative magnitude across the socio-economic distribution. We also demonstrate that although standard measures of financial risk due to illness (defined as household medical spending as a share of total spending) sometimes counterintuitively suggest that more affluent households face relatively greater risk (importantly, presumably due in part to inequality in access to health care), this result is reversed when wage loss is incorporated (Pandey et al., 2018; Selvaraj et al., 2018). Ultimately, our results demonstrate the significance of disability risk (or wage loss associated with illness) as an important but under-recognized issue relevant to the UHC agenda – particularly among the poorest households.

## 2. Methods

### 2.1. Data sources

We use the two most recent longitudinal datasets from India to estimate wage loss and medical spending due to illness among households across the socio-economic distribution: the Village Dynamics in South Asia (VDSA) survey, collected by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), and the Indian Human Development Survey (IHDS). Importantly, the use of longitudinal datasets allows us to use household (or individual) fixed effects, utilizing within-household (or within-individual) variation and flexibly account for unobserved, time-invariant household (or individual) factors. Further, the high-frequency of the ICRISAT data allows us to derive household-specific partial correlations between illness and wage loss. This statistical framework cannot be implemented in other commonly used nationally representative cross-sectional surveys conducted in India such as the National Sample Survey (NSS) or the National Family Health Survey (NFHS). Estimating the relationship between illness and both medical expenses and wage income is complex and longitudinal data analysis allows us to clarify the nature of associations and conditional means that are obscured in cross-sectional data. Nonetheless, in the appendix (Appendix Table A6), we also show qualitatively similar results using the most recent nationally-representative cross-sectional data from India, the National Sample Survey 75th round conducted between 2017–18.

The ICRISAT VDSA survey (hereafter VDSA) is a longitudinal household survey of 1300 households conducted *every month* for 60 consecutive months between July 2010 and June 2015. Households were randomly selected from 30 villages in eight Indian states (Andhra Pradesh, Bihar, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, and Orissa). Four villages were selected from each state (except Madhya Pradesh, from which two were selected) to represent the agro-climatic conditions in India's semi-arid and humid tropical regions, as shown in Appendix Figure A1 Households in each village were in turn randomly selected to represent households in four land-holding classes: large, medium, small, and landless. The survey collected monthly data on labor force participation (number of days worked and wage income) and self-reported illness for each member of the household, as well as consumption and income for the household.

For our purposes, the high frequency collection of data on illness, wages, and spending at the household level is particularly useful (and rare). For each household in the VDSA sample, we code an illness episode for a household as a binary outcome equal to 1 if any member in the household reported an illness in a given month, and zero otherwise. We also code wage income for households as the sum of earned wage income for all household members and income earned from household businesses. This approach thus incorporates compensatory changes in the labor supply of other household members associated with given member's illness (related work has used the IHDS to document such patterns in labor supply (Alam et al., 2018)), To measure medical care spending, we use monthly data on total household spending for medical care.

Despite the VDSA survey's detail and high frequency, it is not representative of the broader Indian population. Therefore, in harmonized parallel analyses, we also use the VDSA survey together with data from the Indian Human Development Survey (IHDS) to consider the extent to which our VDSA results generalize to the rest of India. The IHDS is a nationally representative longitudinal household survey fielded in 2005 and again in 2011, collecting data from 42,152 households in 1503 villages and 971 urban neighborhoods across all major Indian states. The IHDS panel contains comprehensive information about major illnesses over the past year for each individual in the household (major illnesses include diagnoses of cataracts, tuberculosis, hypertension, and heart disease), the corresponding medical spending over the past year for each episode of illness, and total household income by source over the past year. The panel structure of the IHDS allows us to observe an individual's illness history at two points in time, once in 2005 and then again in 2011.

To conduct harmonized analyses that can be implemented in both the VDSA and IHDS samples in the same way (with comparable measurement of illness, wage income, and medical spending over the same lengths of time), we construct individual-year observations in each dataset. We code illness episodes in both datasets as an individual's number of sick days in the preceding year due to major illness. To measure household wage income, we sum monthly data on wage income in the VDSA data, and we use wages exclusive of benefits or bonuses in the IHDS data. For medical spending, we sum monthly data on medical spending in the VDSA data, and we use total spending for services, medicines, hospitalizations, and travel to health facilities in the IHDS data.

Finally, to measure the socio-economic status of households in both surveys at the start of their survey periods, we follow a standard convention in economics by using baseline total household spending per capita (henceforth "economic status" – consumption spending per capita, broadly defined, is a widely-used measure of economic well-being (Huppert et al., 2009; Meyer and Sullivan, 2012; Ravallion, 2020), and has been used by others studying the effect of illness on consumption spending (Wagstaff, 2007)). Appendix Table A1 provides summary statistics for both the VDSA and IHDS samples.

### 2.2. Statistical analysis

Our statistical approach uses longitudinal variation within households in both the VDSA and IHDS samples to estimate the economic burden associated with illness separately for wage income and medical spending. Because the structure (and frequency) of two data sources differ, we use variants of the same general statistical framework, focusing first on the VDSA data (to capitalize on the strengths of its monthly survey waves), and then conducting parallel analyses using a statistical framework that can be implemented in the same way in both datasets (to consider how our results generalize to the broader Indian population).

Our statistical analysis proceeds in two steps. We first leverage the richness of the VDSA sample (with 60 monthly observations per household) to estimate the following household-level model:

$$y_{ht} = \sum_{h=1}^{n} \beta_h Illness_{ht} + \alpha_h + \lambda_t + \varepsilon_{ht} \quad (1)$$

where $y_{ht}$ is an outcome for household $h$ in month $t$ (either wage income per capita or medical spending per capita); $Illness_{ht}$ is an indicator variable equal to 1 if any member in household $h$ reported an illness in month $t$ and 0 otherwise; and $\alpha_h$ and $\lambda_t$ are household and month fixed effects, respectively. This approach uses within-household variation in illness episodes over time to estimate the *household-specific* burden associated with illness separately for wage income and medical spending (i.e. the coefficient on illness differs across households). The remarkably high-frequency VDSA sample enables us to study household-specific temporal nuances of illness episodes. Importantly, because the two components of total economic burden may vary considerably between poorer and wealthier households, we provide household-specific estimates and show that the associated relative magnitudes of wage loss and medical spending vary systematically across the distribution of socioeconomic status. We plot these household-specific estimates by economic status using a flexible polynomial fit.

Then, using a regression framework that can be implemented in the same way in both the VDSA and IHDS samples, we estimate the economic burden of wage loss and medical spending associated with illness at the individual-year level:

$$y_{it} = \sum_{q=1}^{5} \beta_q (Illness_{it} \times Quintile_i = q) + \alpha_i + \lambda_t + \varepsilon_{it} \quad (2)$$

where $Illness_{it}$ is the number of days of illness in year $t$ for individual $i$, $Quintile_i$ is the individual $i$'s economic quintile (of the baseline per capita expenditure distribution); and $\alpha_i$ and $\lambda_t$ are individual and year fixed effects, respectively. This approach uses within-individual variation in illness episodes over time and compares the wage income and medical spending of individuals that experienced an illness to those that did not.

We control for a series of fixed effects in both of our statistical models. The household fixed effects $\alpha_h$ (or individual fixed effects $\alpha_i$) control for differences in time-invariant household (or individual) characteristics such as wealth or long-term health, while the time fixed effects $\lambda_t$ control for time-varying events common to all households such as economic downturns.

## 3. Results

### 3.1. VDSA sample

In the VDSA sample, over a period of 60 months, 1184 households (88%) reported an episode of illness, 1337 households (99%) reported medical care spending, and 1270 households (95%) reported participating in the labor market. Average monthly wage income was Rs. 1169 per capita per month, average medical spending was Rs. 93 per capita per month, and total household spending was Rs. 1160 per capita per month.

Fig. 1, Panel A graphs 1300 household-specific estimates of the economic burden associated with illness from Equation (1), separately for wage income and medical spending, across the distribution of household economic status (measured as the logarithm of baseline household spending per capita) – ranging from poorest households (on the left, with a log value of 6, equivalent to household spending of Rs. 400 per capita or 8·75 USD) to most affluent households (on the right, with a log value of 8, equivalent to a household spending of Rs. 2900 per capita or 63·5 USD). To smooth the gradient of these relationships across the economic distribution, we use a fractional polynomial fit. For each household-specific estimate, the figure also shows 95% confidence intervals. For a household at the mean of the economic distribution, a day of illness is associated with a reduction in monthly wages of Rs. 53 [95% CI -10 to −70] per capita and an increase in medical spending of Rs. 72 [95% CI 50–95] per capita. Appendix Table A2 also reports regression estimates of the average per capita burden associated with illness through both wage loss and medical care spending (Rs 77 [95% CI -99 to −57] and Rs 126 [95% CI 110–142], respectively).

Considering how these estimates vary across the income distribution, the absolute value of wage loss associated with illness is greater among poorer households, reaching nearly Rs. 150 per capita per month [95% CI 50–200] among the poorest (relative to median baseline household spending of Rs. 550 per capita per month). This relationship is then generally flat across the middle of the distribution of household economic status, increasing again in absolute magnitude among the most affluent households (at the right), reaching Rs. 150 per capita per month [95% CI 20–220] (relative to median baseline household spending of Rs. 2000 per capita per month). Alternatively, medical spending associated with illness is relatively low among poorer households (below Rs. 50 per capita per month [95% CI -10 – 50]), and then rises steeply among wealthier ones, reaching Rs. 450 per capita per month [95% CI 350–500] (presumably reflecting, at least in part, underlying differences in access to medical care).

Fig. 1, Panel B explicitly decomposes the two major components of total economic burden associated with illness across the economic distribution, with the burden value from medical spending (in red) stacked on top of the burden value from wage loss (in blue). To examine more directly how the relative magnitudes shown in Panel A compare to baseline household spending, Fig. 1 Panel B shows, at each point across the economic distribution, the relative size of wage loss and medical spending as a share of total household spending at baseline. Strikingly, among the poorest households, wage loss associated with illness is around 15% of total household spending – nearly three times greater than the size of medical spending (which is approximately 5% of household spending). Alternatively, for the most affluent households, wage loss is less than 5% of total household spending, while medical spending is about three times greater, at roughly 15% of total spending.

Fig. 1, Panel C then summarizes these results, showing the share of the total economic burden (measured as the sum of wage loss and medical spending) that is lost earnings. For the poorest households, wage loss accounts for more than 80% of the total economic burden of illness, but only about 20% of the burden among the most affluent households.

### 3.2. Harmonized VDSA and IHDS samples

We then use the harmonized VDSA and nationally-representative IHDS samples to consider the extent to which the VDSA results (shown in Fig. 1) generalize to the broader Indian population. As Appendix Table A1 shows, in the IHDS sample, more than 15,770 households (40%) reported an illness in the preceding year. Average annual wage income is Rs. 12,201 per capita, average annual medical spending is Rs. 1270 per capita, and average total annual household spending is Rs. 22,737 per capita. The summary statistics for the harmonized VDSA sample are quantitatively similar.

Fig. 2, Panel A shows estimates of the marginal burden correlated with one day of major illness from Equation (2) at each quintile in the

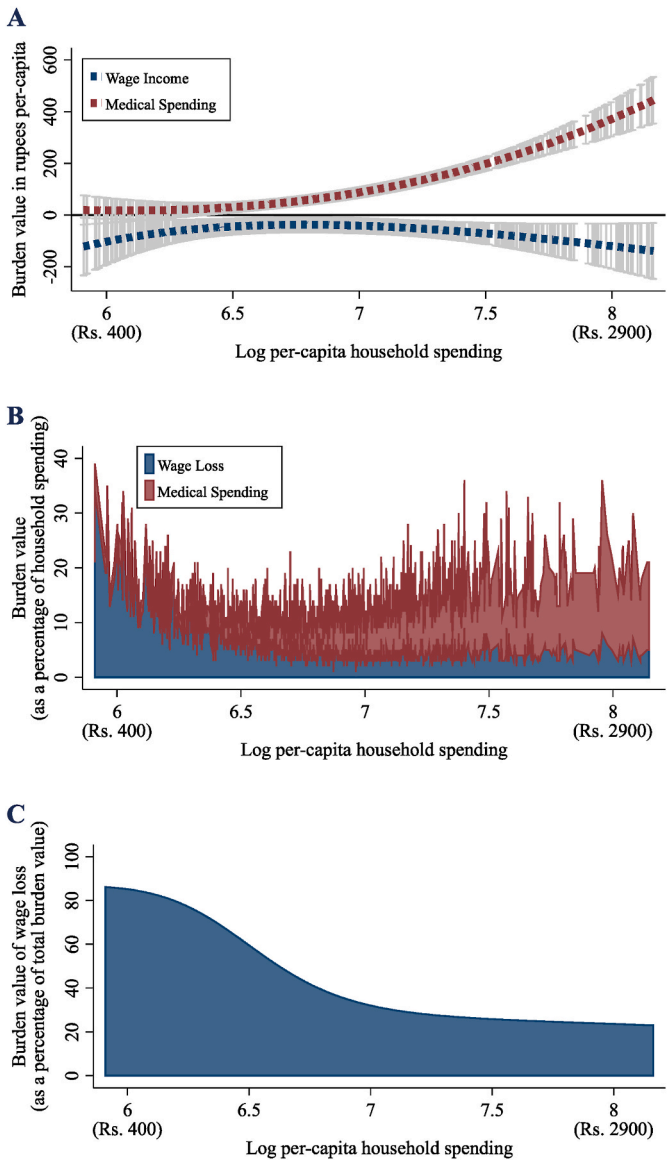


**Fig. 1.** Panels A–C use VDSA sample data of 1300 households collected monthly between July 2010 and June 2015. Panel A plots fitted values from a flexible polynomial regression of the 1300 household-specific estimates from Equation (1) on the logarithm of 2010 per-capita household spending. The regression includes a second-degree fractional polynomial of logarithm of 2010 per-capita spending as a covariate. The grey bars represent 95% confidence intervals of the flexible fractional polynomial fit. A logarithm value of 6 (on the left) is equivalent to household spending of Rs. 400 per capita or 8·75 USD, and a logarithm value of 8 (on the right) is equivalent to household spending of Rs. 2900 per capita or 63·5 USD. Panel B decomposes the total economic burden of illness into its two components – wage loss (in blue) and medical expenses (in red) and shows the economic burden (for both wage loss and medical expenses) as a percentage of total household spending. Finally, Panel C displays the proportion of the total economic burden of illness that is attributable to lost wages. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

distribution of household economic status. For a household in the middle quintile, a day of illness in the past year is associated with reductions in annual per capita wage income of Rs. 45 [95% CI -91 to −5] and Rs 20 [95% CI -8 to −35] in the harmonized VDSA and IHDS samples, respectively. The corresponding increases in per capita medical spending associated with illness are Rs. 120 [95% CI 75 to 166] and Rs. 88 [95% CI 83 to 93] (Appendix Table A2 also shows that marginal burden values averaged across quintiles are generally similar.). Panel B then presents average burden results, multiplying the marginal burden estimates in Panel A by 50 days (the average number of major illness days in a year for an individual in the IHDS sample), and expressed as a proportion of total household spending.

Turning to how these results vary across the distribution of economic status, Fig. 2, Panel A also shows that wage loss is generally greater among poorer households (in the lowest economic status quintile, for example) – although this magnitude is larger in the harmonized VDSA than in the IHDS sample. At the same time, in both data sets, the reduction in wage earnings associated with illness is relatively smaller among those with higher economic status. Finally, in both the harmonized VDSA and IHDS samples, medical spending associated with illness is relatively smaller at lower quintiles and larger at higher quintiles.

Fig. 2, Panel C shows the share of the total burden of illness (wage loss and medical spending) that is lost earnings. Overall, the results – and the gradient in each outcome across the economic distribution – are generally consistent with those shown in Fig. 1. And although this gradient is less steep in the IHDS sample than in the VDSA sample (in the bottom quintile, wage loss as a share of total burden is 47% in the IHDS sample, as opposed to 62% in the VDSA sample, for example), wage loss accounts for a substantially larger share of the total economic burden of illness among poorer households.

## 4. Discussion

In this study, we show that wage loss accounts for a substantial portion of the total economic burden associated with illness in India. Importantly, this is disproportionately true among the poorest households. In the high-frequency VDSA sample, more than 80% of the economic burden associated with illness among the poorest households is wage loss – a figure that drops to about 20% among the most affluent households. Although this gradient across the economic distribution is somewhat less steep in the nationally-representative IHDS sample, the same general pattern is present. These findings suggest that even if successful, the current Universal Health Coverage (UHC) agenda may still not protect households in India, and potentially many low- and middle-income countries, from substantial financial risk due to illness.

Our paper makes three contributions to existing studies of the economic burden of illness. First, it directly estimates and compares the magnitude of wage loss and direct medical care expenses associated with illness using detailed, high-frequency data on wage earnings (including informal activities), medical spending, and illness. Past studies have largely focused on either total economic burden or medical care costs, but our direct comparison informs health policies focused on strengthening financial protection. Second, we show that the seemingly counterintuitive result that more affluent households face relatively greater financial risk due to illness (obtained using standard measures of financial risk, defined as household medical spending as a share of total spending) reported by some other studies – which importantly, presumably reflects inequality in access to health care – is reversed when wage loss is incorporated (Pandey et al., 2018; Selvaraj et al., 2018). Third, given the large number of longitudinal observations for each household in the VDSA sample, to the best of our knowledge, our paper is the first to produce *household-specific* estimates of the burden of illness, enabling us to trace-out both wage loss and medical care expenses flexibly across the distribution of household economic status – and a more granular analysis of disparities between the poor and more affluent.

The Appendix also reports additional evidence from the VDSA that strengthens our conclusions. Using an event-study design, Appendix Figure A2 shows that trends prior to illness for both wage earnings and medical spending are largely flat, supporting the 'parallel trends' assumption underlying our statistical approach (and suggesting that episodes of illness are not the results of declines in labor income). Appendix Tables A3-A5 also show intuitive patterns of heterogeneity (that

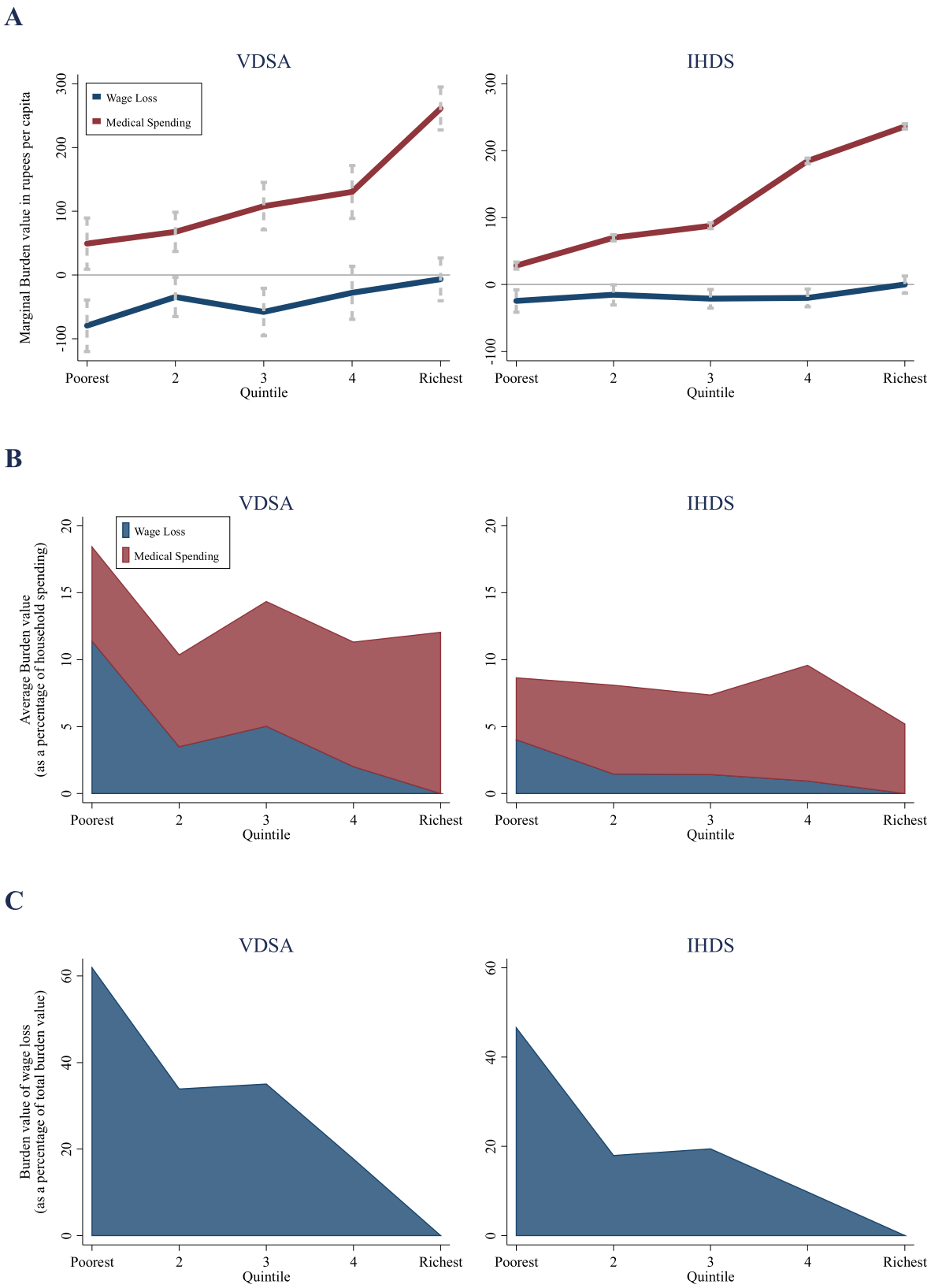


**Fig. 2.** Panels A–D display comparable estimates from the harmonized VDSA (left) and IHDS (right) datasets. The IHDS contains data from 42,152 households in 2005 and again in 2011. Panel A presents estimates of the coefficients (from equation (2)) capturing the burden of illness on wage income and medical spending at different quantiles of the distribution of the household per capita spending. Both graphs include point-wise error bars showing the 95% confidence intervals for each coefficient. Panel B decomposes the total economic burden of illness into its two components – wage loss and medical spending and shows the economic burden as a percentage of total household spending. Panel C shows wage loss as a percentage of total household spending. In all panels, wage loss results are shown in blue, and medical spending results are shown in red. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

the economic burden of wage loss is greater for illnesses to household heads, for longer episodes of illnesses, and for households engaged in informal (vs. formal) sector work and are therefore more likely lack illness benefits).

Our study also has several limitations. First, we do not use the most recently conducted cross-sectional household survey in India for our main analysis. However, this is purposeful because our statistical framework – which allows us to control for unobserved, time-invariant household (or individual) factors that may otherwise bias quantitative estimates of the economic burden of illness – requires longitudinal data, and we do use the most recently conducted publicly available longitudinal datasets. Nonetheless, in the appendix, we also present results using the most recent nationally-representative cross-sectional survey data from India as well, the National Sample Survey (NSS) 75th round conducted between 2017–18. We report these estimates in Appendix Table A6, showing the same qualitative results and indicating that loss of wage income accounts for twice as much of the total economic burden associated with illness in the poorest income quintile relative to the most affluent quintile.

Second, in comparing the relative magnitude of economic burden through wage loss versus medical care spending, we conduct our analysis in an environment in which a degree of insurance already exists (health insurance in particular). Basic primary care provided by the public sector is in principle free, and many state health insurance schemes have emerged along with national programs like the Employee State Insurance Scheme (ESIS), *Rashtriya Swasthya Bima Yojana* (RSBY), and *Pradhan Mantri Jan Arogya Yojana* (PMJAY) (Hooda, 2020). However, the majority of outpatient services in India are provided by private providers (frequently in the informal sector), and by 2014 (several years after the 2011 IHDS wave), only about one-fifth of hospitalized households had some form of formal insurance coverage (Choudhury et al., 2019). To a lesser extent, the Employee State Insurance Scheme (ESIS) provides a degree of both medical and wage loss insurance to formal sector workers in some industrial regions of India, although it ultimately covers less than 8% of the Indian workforce (La Forgia and Nagpal, 2012; Prasad and Ghosh, 2020). However, our analysis is important and policy-relevant in examining the remaining sources of financial risk due to illness.

Third, results from India, even those estimated in a nationally-representative sample, do not necessarily generalize to other countries. Nonetheless, India is the second most populous country in the world and is therefore an important marker of progress toward achieving Universal Health Coverage and the Sustainable Development Goals (SDGs) (World Bank, 2019).

If there were greater policy emphasis placed on wage loss associated with illness – and insurance against this risk (through wage loss or short-term disability insurance, for example), verification would present a difficult challenge in the design and implementation of such programs. In high-income countries, clinician certification of illness or disability is commonly required to initiate the provision of benefits. However, in environments like India, where a substantial share of healthcare providers is in the informal sector (with little or no formal clinical training and limited regulation), the challenges of verifying illness are likely to be more significant. An imperfect solution to this challenge has been the emergence of hospital cash benefits or hospital confinement indemnity insurance, which provide benefits commonly indexed to a beneficiaries' wage rate – but requiring hospitalization to initiate the payment of benefits (and hence may reflect inequality in access to health care, for example).

We also note that a considerable amount of informal insurance exists in low- and middle-income countries (through transfers from extended family members and social network members, for example). However, a large body of research shows that 'consumption smoothing' through informal insurance mechanisms is both incomplete and inefficient in India and other countries (Gertler and Gruber, 2002; Kochar, 1995; Morduch, 1995; Townsend, 1994; Weerdt and Dercon, 2006), suggesting that potentially large welfare gains could still be achieved by the provision of formal wage loss or disability insurance, even to those with other sources of informal support. Future research should consider the types of illnesses (major morbidities versus short-term morbidities, for example) and other types of conditions (locations, occupations, household member relationships to the primary income earner, etc.) for which disability risk is most substantial.

Finally, there has been recent debate about how widely to interpret the aim of providing financial protection through UHC, with some arguing for a narrower focus on out-of-pocket medical spending alone (Wagstaff and Neelsen, 2020), and others proposing a more expansive approach that incorporates wage loss due to illness (Lönnroth, 2020). We inform this debate by providing direct quantitative evidence on the relative importance of both components of the burden of illness. In particular, we show that among the poorest households, wage loss is a much larger part of the full financial burden of illness – a result with important implications for ongoing UHC efforts (Patel et al., 2020).

## Credit author statement

**Aditya Shrinivas:** Conceptualization, Methodology, Software, Validation, Formal Analysis, Investigation, Data Curation, Writing – Original Draft, Writing – Review & Editing, Visualization, **Suhani Jalota**: Software, Data Curation, Formal Analysis, Writing – Original Draft, Writing – Review & Editing, Visualization, **Aprajit Mahajan**: Methodology, Validation, Formal Analysis, Investigation, Writing – Original Draft, Writing – Review & Editing, Visualization, **Grant Miller:** Conceptualization, Methodology, Investigation, Validation, Writing – Original Draft, Writing – Review & Editing, Visualization, Supervision.

## Data availability

The de-identified data used in this study are publicly available online

## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2022.115583.

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