

Working Paper 269

**Burden of Income Loss due to
Ailment in India: Evidence from
NSS data**

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ISBN 978-81-7791-125-1

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The Institute for Social and Economic Change,
Bangalore

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BURDEN OF INCOME LOSS DUE TO AILMENT IN INDIA: EVIDENCE FROM NSS DATA

Amrita Ghatak* and S Madheswaran**

Abstract

The main aim of this paper is to investigate the impact of health on labour productivity surrogated by income at the household level. Using data from a nationally representative survey of 73, 868 households conducted from January to June 2004 in India, this paper shows that the burden of income loss due to ailment, which is significantly high in the poorest of the poor in both rural and urban areas, forms a geographic contiguity across the six states of eastern and central India (Bihar, Uttar Pradesh, Chhattisgarh, Jharkhand, Orissa and West Bengal) indicating institutional failures in improving or ensuring the quality of public health. Policy level variables such as the amenities index consisting of information on household level health influencing factors, e.g., availability of latrine, drainage, safe drinking water, clean energy for cooking etc., gender composition of the household reflected in the sex ratio of adult household members in the working ages, average education of the household members, etc., are significant determinants of the burden of income loss due to illness in addition to other socio-demographic factors such as social group, religion and age.

Key words: Welfare, Health and Economic development, Poverty

JEL Classification Codes: D63, I31, I15, P46

Introduction

The provisional result of Census 2011 shows that India's population was 1,210 million on March 1, 2011. This is larger than the population projected by experts and most professional organisations. However, it also comprises of large chunk of people in the working age group. If this group turns out to be skillful and healthy labour, it will be a "demographic dividend". The policies of twelfth five-year plan aim for universal and equitable strategies to ensure health through many programmes such as NRHM, National Health Bill, health insurance, etc. However, these programmes often fail to co-ordinate with poverty eradication and employment generation schemes. Hence, in the present demographic and socio-economic conditions and the country still striving to eradicate poverty and inequality, the costs of

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The authors are thankful to Professors K S James, Meenakshi Rajeev, Abdul Aziz, and R S Deshpande, Dr C M Lakshmana, Dr Sakthivel Selvaraj, Dr Biplab Dhak, Dr T R Dilip, Ms B P Vani and Mr Anup Karan for their useful comments and discussions on the earlier versions of this paper. They are grateful to the anonymous referee and editor of the working paper series of ISEC as well. Amrita Ghatak is grateful to Dr Suddhasil Siddhanta and Dr Debasish Nandy for their substantial help and generous advice on the various issues discussed in this paper.

poor health assumes importance not only in economic terms but also of welfare in the aggregate. Health carries an intrinsic value but it is the instrumental value of an individual's health that has a direct and indirect impact on economic well-being, which is reflected in productivity, labour supply, income, etc.

The intrinsic value of health that goes far beyond the earning capacity of an individual because a long, healthy and more productive life is measured by the value an individual attributes to her health. However, the value people attribute to health is difficult to measure because there is no direct observable market price. In some studies (WHO, 2008) it is inferred from an individual's decision that involves a trade-off between money and health. For example, demanding greater compensation for performing jobs that come with the risk of health hazards. Hence, an individual's decision not to work in place replete with health risks can reasonably be considered as her perception of and attribute to health. It is applicable largely in the case of manual labourers. The loss of a day's work indicates loss of wages. Nevertheless, loss of wages again reflects the loss of productivity at the individual level.

In view of above, this paper attempts to establish the pattern of the burden of income loss due to ailment across the country and the factors that determine the burden of income loss at the household level. If we identify the factors and their association with the burden, what could be the possible policy prescription?

The paper is organised into seven sections. The next section of the paper discusses a brief review of literature on the issue of health and income, followed by research question, objective, source of data, conceptual framework along with theoretical foundation and finally, the empirical results, discussions and conclusion in the subsequent sections.

Brief review of literature

There are many reasons for the special interest in the relationship between health and labour market outcomes in developing economies. Primarily, there are numerous theoretical models of nutrition-based efficiency wages in development literature (Leibenstein, 1957). It is argued that in poor economies where wages determine consumption levels, the effort of the workers would depend positively on their nutrition and health status and thus on wages. This concept is useful in understanding the philosophy of health-wage link. Health is an important factor that determines an individual's economic and non-economic well-being (Desai, 1987; Strauss, 1986; Sahn and Alderman, 1988). The impact of illness on labour market and social welfare are more complex than mere shifts in productivity, changes in labour participation, or absenteeism (DeLeire and Manning, 2003). However, there is no simple one-to-one relationship between measured productivity losses per worker and the social losses to firms and to workers that we would expect to observe in the market place. Labour contracts also have an important influence on the number of workdays workers miss due to illness. This plays a crucial role for casual workers in a low-income country like India with many casual labourers. They lose wages for being absent on any given day. If they are less productive while working in ill health, the employer may consider it as shirking work and the labourer may lose his/her job.

Some studies (Dohrenwend, 1973; Pearlin, 1989; Baum *et al.*, 1999; House and Williams, 2000) show that workers belonging to lower socio-economic groups suffer more physical, psychological

and social stress than their counterparts from higher socio-economic groups and results in increased incidence of morbidity and mortality among the former. The effect of physical stress reflected in increased morbidity is not well examined through the resultant loss of income. A few studies (McIntyre, Thiede, Dahlgren and Whitehead, 2005; Ettner, 1995) attempted to examine the link between health and income by focusing on the economic consequences of illness and use of health care facilities. They (McIntyre, Thiede, Dahlgren and Whitehead, 2005) included household level impact of direct costs (medical treatment and related financial costs), indirect costs (productive time losses resulting from illness reflected in loss of income) and subsequent responses. It highlighted the fact that the financing strategies of health care placed considerable emphasis on out-of-pocket payments could impoverish households. However, instead of income loss their focus was on out of pocket expenditure. There is growing evidence of households being pushed into poverty or forced deeper into poverty when faced with substantial medical expenses, particularly when combined with a loss of household income due to ill health. However, in the Indian context there is a dearth of sufficient empirical evidence to show whether ill health actually causes sufficient loss of income to affect the well being of the household. A few studies have attempted to examine, in this context, the link between health and productivity and supply of labour (Deolalikar, 1988; Duraisamy and Sathiyavan, 1998; Duraisamy, 2001; Ram and Schultz, 1979) besides the link between health and economic growth (Gupta and Mitra, 2003). However, no studies have considered loss of household income due to ailment to understand the welfare costs of ill-health. It is also important to see the role of institutions as a determining factor of the economic burden of ill health because one of the purposes of the welfare state is to insure the individuals against extreme and unforeseen income loss and to facilitate investments in otherwise neglected spheres (Sinn, 1995). Research in this area of welfare costs of illness is urgently required to frame and implement appropriate social policies to improve access to essential health services and break the vicious link between illness and poverty (McIntyre, Thiede, Dahlgren and Whitehead, 2005).

Source of Data

The study uses data from the 60th round of NSSO (Schedule No. 25.0) for the analysis. Cross section data collected at the household level by the NSSO, Government of India, during January to June 2004 was used for this study. The survey covered 73,868 households all over India. The data provides information on the health status of the individual, labour market information and different socio-economic and demographic factors. In addition to that, it provides information on household characteristics in terms of availability of basic amenities, such as latrine, drainage, safe drinking water based on source, type of cooking fuel, etc¹.

The information on loss of household income due to ailment computed as a percentage of total household expenditure both for inpatient and outpatient treatment across the NSS regions² of India have been considered in this paper as a crucial indicator of welfare. Since, the data has not provided

¹ We have constructed an amenities index based on the information amenities influencing health at the household level. The index will help understand the availability and accessibility of several factors related to health that is often provided by the government through many developmental schemes.

² NSSO has classified the States and Union territories of India into several broad regions based on the agro-climatic conditions.

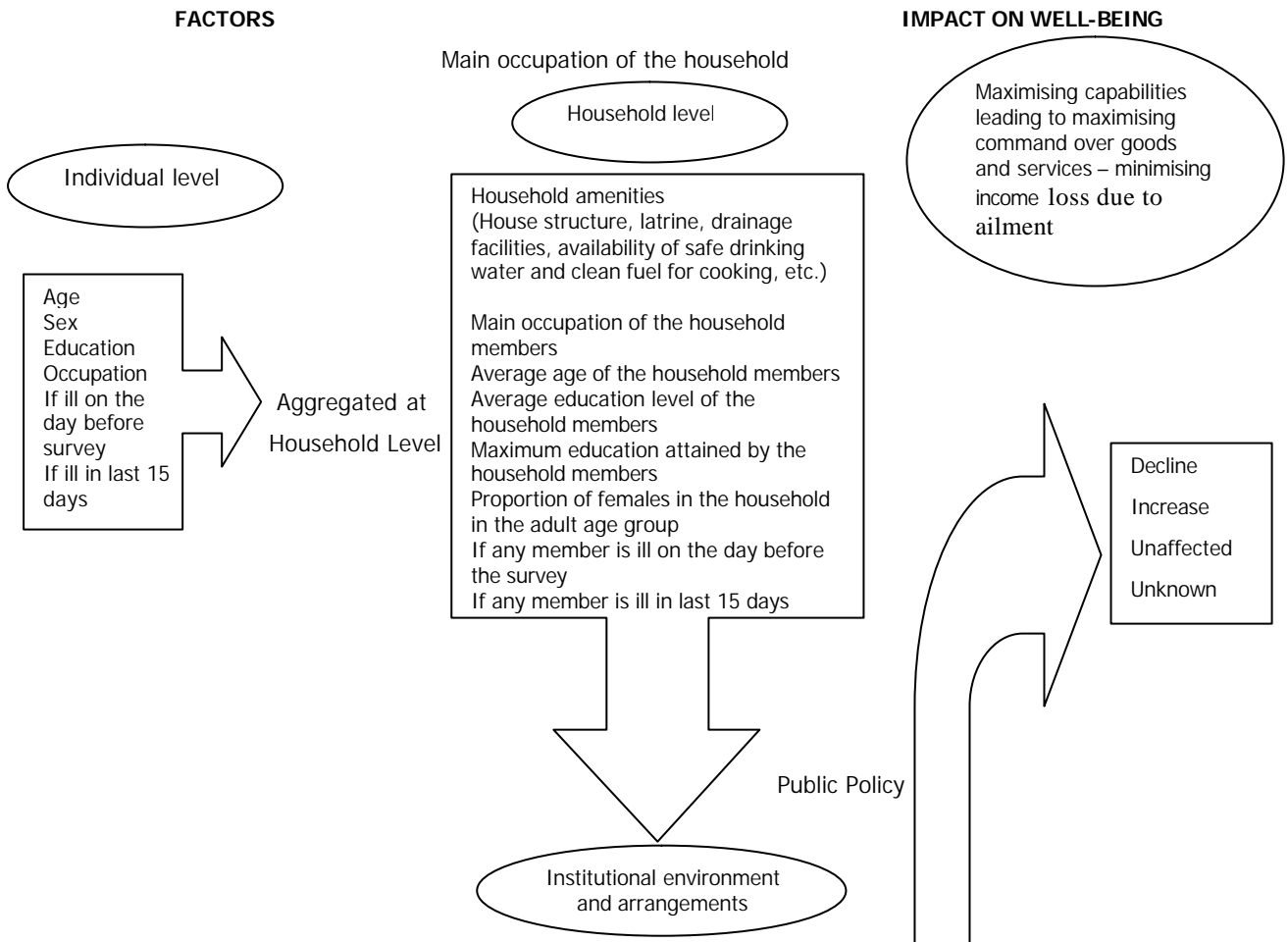
information on household income, the household's expenditure has been considered as the closest proxy for income. Here, it is important to remember that for the individual whose earning largely depends on the manual labour, income and wages do not carry different meanings. On the one hand, such households lose income for ailment, and incur a huge expense for treatment on the other. The loss of income reflects not only the loss of productivity at first, it also reflects individual's attribute to health by deciding not to work for the particular day, as it is difficult to figure out the exact reason of absence – whether it is purely because of severity of illness or because of individual's choice towards leisure. It is however, a more relevant indicator for the manual workers who lose a days wage if absent.

Conceptual Framework

The rationale for specific egalitarianism in the health as a factor of well-being rests on the matrix that health is a merit good, whose distribution, as it is argued should not be determined according to individual's income. That health is a special good or more specifically the highest good was mentioned even by René Descarte (1637) who wrote "...the prevention of health is...without doubt the first good and the foundation of all other goods of this life". There are two alleyways through which health has importance: first, it directly constitutes a person's well-being, second, it enables a person to function as agent – that is to pursue and perform various aims and projects in life. It goes beyond the notion of health as "well-functioning", which is grounded basically on the utility theory that conceptualises health to enable a person in order to increase her human capital or income. It is therefore, reasonable to follow the terminology of Amartya Sen who argued that health is a contribution to a person's basic capability to function – to choose the life she has reason to choose. However, based on the current data at hand we tried to bring empirical evidence to show health as a factor of well-being in the premise of its link with labour productivity or enabling an individual to earn more income.

As explained below in the Flow Chart 1, different individual and household level factors determine well-being. The factors act through channels of institutional environment as well as arrangements which may enhance welfare, make it decline or keep it unchanged. This is where public policy plays an important role in bringing welfare to society as a whole. It is argued that social welfare is attained with reference to people's basic capabilities rather than their utilities (Sen, 1985). Hence, inherent factors like health, which make an individual capable, have an influence on welfare. However, a notion of fairness might be useful for policy making if it serves as a good proxy for raising utilities (Kaplow and Shavell, 2001).

Chart 1: Impact of different individual and household level factors on household well-being



Like utility, welfare is viewed simply as a conceptual device to facilitate the analysis of people making choices (Clark, *et. al*, 1975). It is assumed that individuals maximise utility while society maximises welfare. The nature of utility or welfare, therefore, rests entirely on the value judgments of the individual or society (Clark *et al.*, 1975).

A *rational care* theory that explains the normative relationship between a person's welfare and concern for that person helps us to understand the intrinsic importance of health and therefore factors influencing the health of individuals. Having said that health will enhance an individual's well-being even if we go beyond the normative idea of welfare, we can argue that at the *metaethical* level health and health influencing factors have an influence on the individual and social welfare. To illustrate further, good health will make an individual capable of working for more hours and with more vigour, which will be reflected in his productivity and thus in her income. It will enable the worker to have a command over goods and services leading to satisfaction. However, the "quality" of satisfaction as explained by Mill (Mill, 1863, later on published in 1906) may vary from individual to individual. We assume individuals are rational and, hence, deny the unreasonable choices and psychological aspects of well-being. We rely on the concept that says an individual wants what she should want for her sake that indicates the individual to be rational, which in turn reflects her psychic state in some way.

In this context, the information on loss of household income due to health reasons serves two theoretical purposes in conceptualising that the link between health and productivity has an impact on poverty and well-being. First, it supports John Stuart Mill's Utilitarianism, which indicates that raising command over goods or raising income implies development. It equates a person's well-being with command over commodities (Anand and Ravallion, 1993). However, it is also commensurate with the idea of capability approaches wherein underdevelopment is viewed as the lack of certain basic capabilities, rather than income *per se*. It goes beyond the implications of utilitarianism, because it, like the basic needs approach, focuses on the people rather than (material) things at the centre of the development agenda (Clark, 2007). Having said this, the second point goes beyond the simple utility maximisation framework as it recognises the instrumental importance of income and resources for promoting human well-being on the one hand and on the other captures the lack of capability or the intrinsic value of health reflected in poor health.

Theoretical Foundation

The health of an individual is a positive factor in achieving utility while denial of it is assumed to reduce utility. This paper essentially conceptualises reduction in utility reflected in reduction in labour productivity and proxied by income. Hence, the impact of loss of income due to ailment is ideally realised through the "income effect" on consumption. The interest in this model stems from the analyses of E Slutsky in 1915, in which the response to a price change was illustrated in terms of the substitution effect and the income effect. We follow a simple static model where the effect of change in income or change in other parameters such as price is shown on the consumption of a single good. We borrow the basic idea of the consumer theory to model the effect of reduction in income on utility. At a later stage, however, we will show how this reduction in utility may reduce the welfare of a society.

We illustrate the model graphically as follows. Let us suppose a consumer with preferences given by the indifference curves shown in Figure 1a, below, initially faces the budget constraint YY and attains maximum utility at point A, consuming x_{10} amount of x_1 . Now suppose the income is reduced. We assume two separate cases: first, there is a reduction of income but the price of x_1 is pegged (Panel 1a). In this case the budget constraint is reduced to Y_1Y_1 resulting in a reduction in consumption of both the bundle of commodities at x_{11} . The new optimum point of consumption will be at B where the utility achieved will be at level U_1 lower than the previous level of utility at U_0 . Hence, $x_{10}-x_{11}$ is the income effect, which is negative in sign.

Now, let us assume that the price is also changed; in this case it is assumed to increase (even if we assume that price is decreased as a response of reduced demand, we may use the same diagrammatic approach). It is reasonable and realistic to assume that price increases over time. We introduce an increase in price for good x_1 . The new budget line Y_1Y_1 will pivot inward to the left producing a new utility maximum at point C (Figure 1b). The diagram (Figure 1b) relates to finite movements in the consumption of x_1 due to a finite change in p_1 . It is therefore not exactly comparable with the Slutsky equation that basically assumes instantaneous rates of change. We still, however, can show the substitution effect and income effect in the above diagram (Figure 1b). When p_1 is increased,

the horizontal intercept decreases and the budget line pivots to Y_1Y_2 . The original tangency is at C on the new shifted budget line Y_1Y_2 .

Figure 1a: Effect of Change in income on consumption when price is fixed

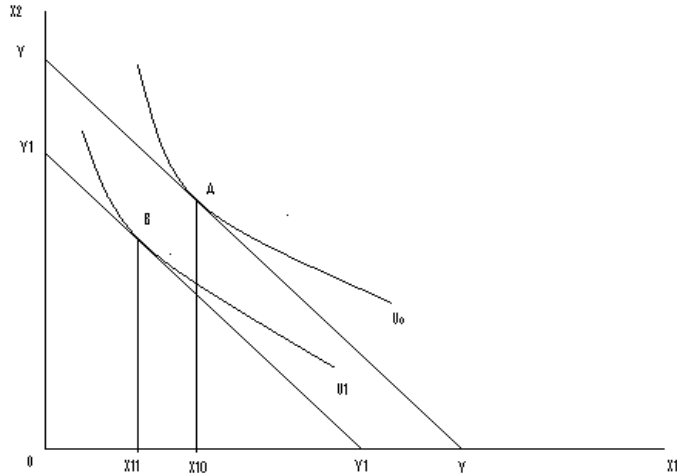
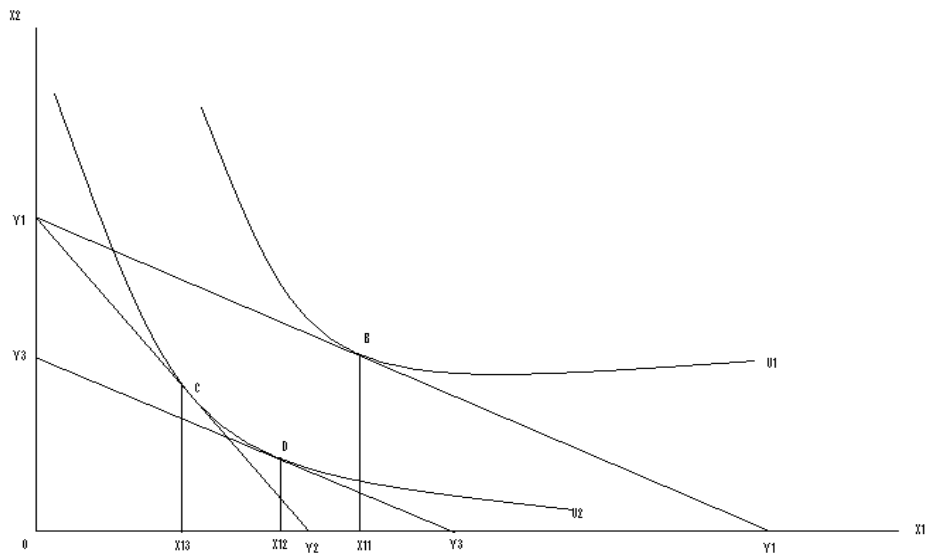


Figure 1b: Effect of change income on consumption when price is increased



The change of consumption of x_1 is $x_{11}-x_{13}$. Since, the individual is assumed to achieve the same level of utility as U_2 , the budget line will slide around the indifference curve U_2 until it is parallel to budget line Y_1Y_1 . Here, the total change in consumption is $x_{11}-x_{13}$, which is partly attributed to $x_{12}-x_{13}$, a pure substitution effect since utility is held constant. The remaining part, i.e., $x_{11}-x_{12}$ is the pure income effect since price is held constant.

Hence, the total change in consumption of x_1 as depicted in Panel 1b is:

$$X_{11}-X_{13} = (X_{12}-X_{13}) + (X_{11}-X_{12})$$

It corroborates our problem in which an individual loses income due to ailment to end up with less consumption not only as an outcome of income reduction but also because prices of commodities increase over time in the real world. Thus, at a given point of time she ends up losing consumption of x_1 goods primarily from x_{10} to x_{11} (Figure 1a) due to loss of income resulting in an inward or leftward shift in her budget line. Finally, she further loses consumption of x_1 from x_{11} to x_{13} , due to increase in price for x_1 , which has not only price effect but also further income effect similar to the Slutsky compensation. The diagrams so far helped us understand how loss of income causes an individual to lose command over goods and services. We now collate this idea of loss in consumption as a result of income loss to the idea of social welfare. Arrow's impossibility theorem shows that there is no ideal way to aggregate individual preferences into social preferences. We do not rely completely on any particular form of social welfare function. We borrow the idea of a social welfare function that is referred to as the "classical utilitarian" or "Benthamite Welfare Function", which shows that the welfare of a society is the accumulation of welfare of each member of the society in an additive form.

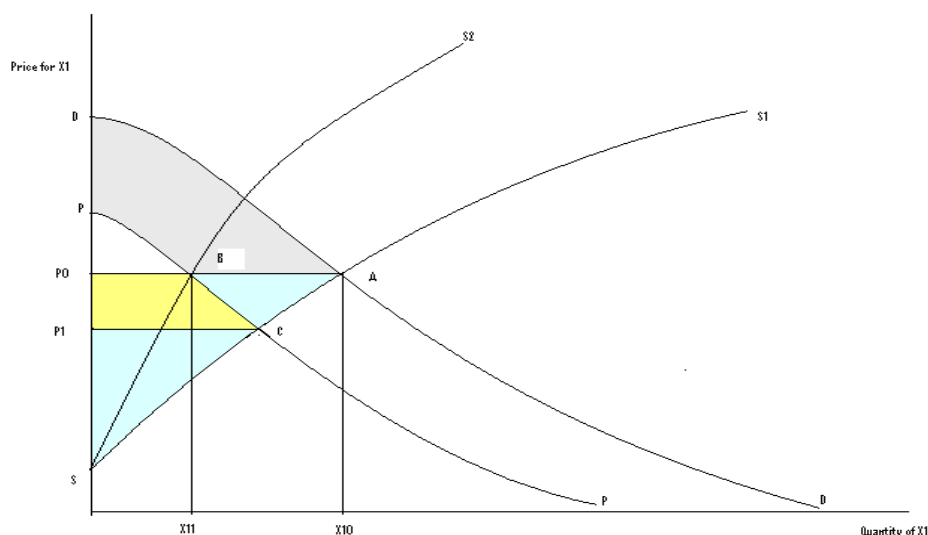
$$\text{Hence, total welfare } W = f(u_1, u_2, \dots, u_n) = \sum_{i=1}^n a_i u_i, \text{ for all } i=1, 2, \dots, n$$

Nonetheless, we have more concern over the Rawlsian social welfare function that depends only on the welfare of the person with the minimal utility. Hence, in the present model the welfare of persons who lost consumption of x_1 goods because of a budget constraint due to ailment is our matter of concern. We have shown the effect of both the change in income and change in price on the consumption of a single good. In some exceptional cases, where the industry is highly competitive, technology is rapidly changing and thus price might decline instead of increasing over time. Electronic goods such as mobile phones, automobiles, computers, accessories, etc., have evidently shown a decline in prices for the same quality and quantity of product over time. On the contrary for other goods and services in the category of basic necessities such as food, clothes, education, health services, and basic household amenities that have an influence on the health of household members, the price increases over time. However, to deal with the problem of computing the burden of real income loss among different group of individuals across the country, we computed the share of income loss in the total income at the household level instead of considering simple absolute income loss due to ailment. The burden is understood through this computed share over a particular reference period. It will make the burden of income loss due to ailment faced by each household comparable and by collating the loss of utility of each household we may attain the loss of social welfare, following the Rawlsian concept of welfare.

We therefore, consider the consumers and producers surplus to examine the loss of social welfare in the context of the reduced income of the economic agents. The loss of income is a factor, which deals with the production and supply of a commodity. It is interesting to note that loss of income reflects the loss of productivity in an instrumental sense, which indicates the loss of production in terms of either quality or quantity of the output. On the contrary, the loss of income forces a consumer to consume less as we already illustrated in the diagrams above. On many occasions, a consumer also acts as a producer in the economy, hence, instead of naming it consumer's surplus or producer's surplus we may alternatively call it demander's surplus and supplier's surplus, respectively, as suggested by Varian (Varian, 2005).

In a competitive set up, the following Diagram 2 shows the equilibrium consumption and price at A where the demand for x_1 equates supply. Now, we assume that there is an inward shift in the demand curve as a result of reduction in disposable income due to loss of household income. The demand curve shifts from DD to PP. At the existing price level, P_0 , the reduced demand for x_1 is at x_{11} . If the producer does not reduce supply or production of x_1 on par with the reduced demand immediately, production will continue to x_{10} . Hence, the consumers' surplus is the triangular area DP_0A while the producers' surplus is the triangular area P_0SA in the initial situation. With the change in aggregate demand for x_1 , the consumers' surplus reduces to the triangular area PP_0B . The producer may now respond in two ways: first, she may cut production at existing price P_0 to match the demand at B; second, she may reduce the price of x_1 to achieve the new equilibrium point at C.

Figure 2: Loss of Welfare Due To Loss In Consumption Of x_1



We assume, as a first case, that production goes down to match the new decline in demand for x_1 . Hence, the new equilibrium is at B, where the amount supplied and demanded match at x_{11} . It follows that the consumers' surplus remains the same, while the producers' surplus, however, is reduced to the area P_0SB . Hence, from the initial point A, the loss of total economic surplus is the area $DPBSA$.

On the other hand, producers may also cut the price and keep up with the existing quantity produced to reach another new equilibrium, which is achieved at C. At C, the consumers' surplus is represented by the area PP_1C and the producers' surplus is P_1SC . In this case also, the absolute loss of welfare compared to the initial point A, is represented by the adjoined areas $DPBA$ and BCA , respectively. Thus, if income of a society at the household level reduces, it results in a reduction of social welfare in absolute sense. Here x_1 may be conceptualised to capture a vector of all the basic necessities such as food, cloth, education, health services, etc., the reduction in income not only leads to quantitative cut in consumption but it also possible that the individual might start consuming poor quality products.

Empirical results

In this section, the burden of loss of household income is described using mapping techniques and tabulations. Finally, we use the econometric analysis to estimate the burden of loss of household's income due to ailment.

Burden of income loss due to ailment among different group of Individuals: On an average almost 22 per cent of the annual household income is lost due to health reasons in India (Table 1) with a substantially high burden in the rural areas (more than 25 per cent) compared to urban areas (12 per cent). Here we use the information on monthly household expenditure provided by NSS interchangeably with the monthly household income. The following map shows the pattern of burden of income loss due to ailment across the NSS regions³ of India. The regions that are known to be economically backward show contiguity of high burden of income loss due to ailment. However, the loss of income may not be incurred purely due to health reasons because the decision on whether or not to participate in work may be determined by many factors other than the health of the worker. On the contrary, the zero loss of income may not necessarily indicate no income loss due to ailment because availability of work, different contract agreements and other institutional factors play key roles in incurring income loss due to loss of a labour day. Nevertheless, the geographical contiguity of high burden of income loss indicates an institutional failure in providing and ensuring the basic amenities and health care services that makes an individual capable of taking part in the labour force.

In the rural areas of India, the burden of income loss is much higher at the household level than in the urban areas. It varies significantly across the income groups in both the rural and urban areas (Tables 1 and 2). One aspect of the inclusiveness of the development process is ideally understood through the phenomenon of poverty. It is striking among the poorest 20 per cent of the population; the burden in rural areas is more than double than that in urban areas (Table 2).

However, in both the rural and urban areas, the burden is highest among the poorest 20 per cent of the population though it varies widely across the quintiles with the lowest burden among the richest. The difference between poorest and richest in terms of burden of income loss due to ill health at the household level is 26 per cent approximately in the urban areas of India. This gap is much wider (55 per cent) in rural areas of India.

³ NSS regions are classified based on the agro-climatic regions of India.

Figure 3. Map of the burden of income loss due to ailment across NSS regions

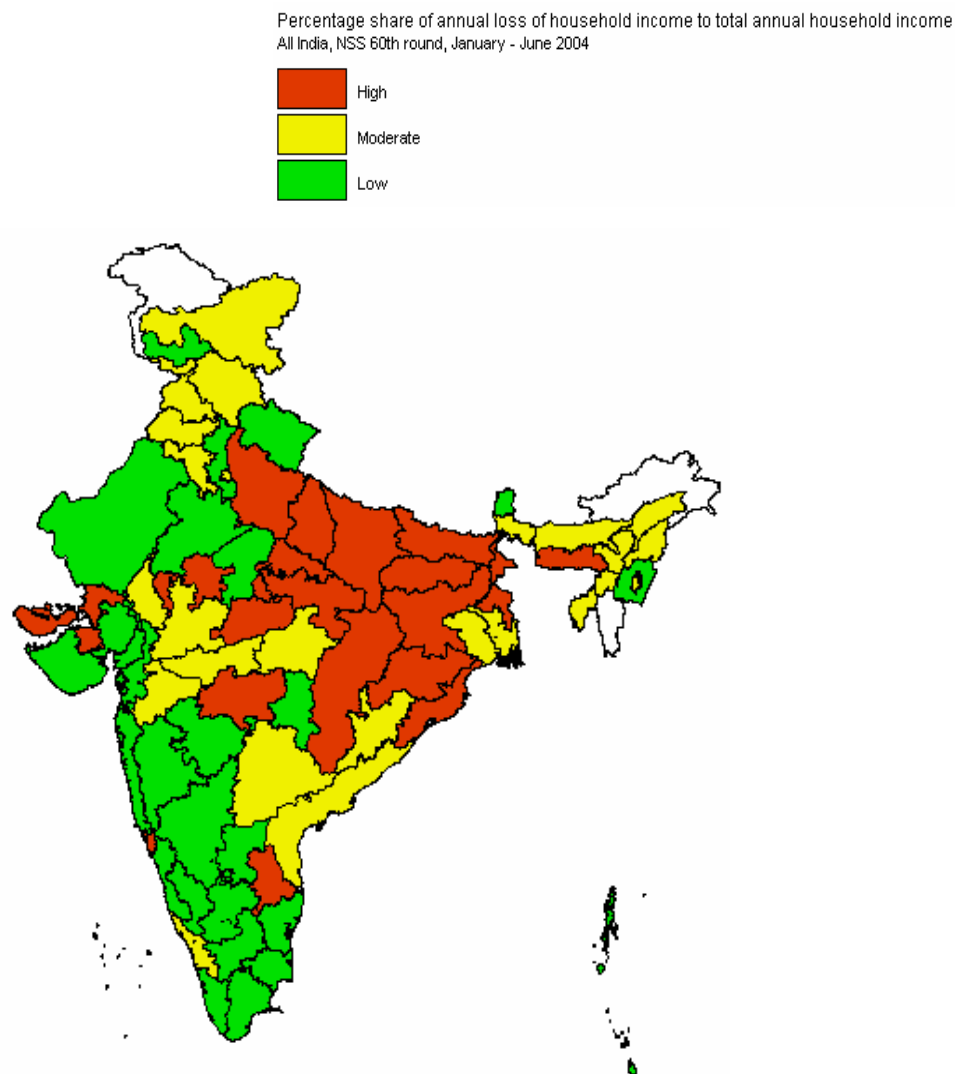


Table 1: Average Share of Annual Income Loss Due To Ailment At The Household Level By Sector

Average share of annual income loss due to ailment at the household level (in %)	
	Mean (Std. error)
Rural	25.2*** (0.088)
Urban	12.2 *(0.123)
Total	21.6** (0.071)

, ** and * indicate 10%, 5% and 1% level of significance, respectively. Figures are weighted based on the multiplier formulated by NSS.*

Table 2: Average Annual Income Loss Due to Ailment at the Household Level by MPCE Quintile Groups and Sectors (in %)

MPCE in quintiles	Rural (Std. error)	Urban (Std. error)	Total (Std. error)
Lowest quintile (poorest income)	64.6** (0.451)	30.8* (0.550)	54.2* (0.350)
Lower quintile (poor income)	15.6*** (0.011)	6.7*** (0.004)	13.3*** (0.008)
Middle quintile (middle income)	24.9*** (0.042)	7.2*** (0.006)	19.0** (0.026)
Upper quintile (rich income)	12.5*** (0.018)	8.2** (0.027)	11.7** (0.015)
Top most quintile (richest income)	9.5*** (0.005)	4.9*** (0.009)	8.3*** (0.005)

, ** and * indicate 10%, 5% and 1% level of significance, respectively. Figures are weighted based on the multiplier formulated by NSS. Source: NSS 60th round unit level data (author's calculation)*

In the writings on development economics, the utilitarian approach and the relatively new capability approach, debate over the most appropriate indicator of well-being – is it income or it is any particular commodity or the overall factors related to education or health — that provide an individual with freedom of choice and command over commodities. In the present context, we argue that the basic amenities influencing health at the household level are the factors that improve the health and make an individual more capable of earning a livelihood rather than age, sex, education, etc.

The data on hand provides information on several household level factors — if proper latrine and drainage is available, if safe drinking water is accessible, whether water is treated before drinking, if the household uses clean source of fuel for cooking purpose, if the structure of the house is pucca, in particular. We constructed the “amenities index” based on the above information at the household level using the technique of principal component analysis. The larger the value of the index, better are the amenities at the household level.

We categorise Indian States into two groups based on the map of burden of income loss at the household level given above. The first category consists of the states that show regions with high burden of income loss while the second category consists of rest of the states and union territories. Therefore, the inclusiveness of development argued here in the context of health and its economic burden attempts to consider both the aspects of well-being – income and other factors that might not necessarily depend on the income but the provision made by institutional arrangements. Having said this, we bring two points of developmental aspects into account. Primarily it shows pro-poor development will indicate the need for optimal budgetary intervention in poverty alleviation schemes. Moreover, it also indicates the need for provision of basic amenities at the household level that might influence the health of the members of the household.

Table 3: Share of Annual Income Loss by Quintile Groups and Household Amenities Across High Burden Region and Other States (in %)

	States with overall high burden			Other States		
	Rural	Urban	Total	Rural	Urban	Total
Poorest income with worst amenities	26.05 (.0498)	31.78 (.0636)	27.25 (.0401)	16.52 (.0139)	22.97 (.0888)	19.66 (.0495)
Poorest income with best amenities	22.01 (.0584)	0.01 (.0004)	20.65 (.0549)	25.46 (.0459)	30.10 (.1592)	26.32 (.0521)
Richest income with worst amenities	20.63 (.0306)	0.30 (.0049)	17.60 (.0287)	11.77 (.0126)	2.65 (.0198)	11.16 (.0117)
Richest income with best amenities	3.80 (.0083)	7.58 (.0259)	4.78 (.0100)	7.76 (.0111)	3.08 (.0083)	6.75 (.0083)

Source: Author's calculation is based on unit level data of the 60th round of NSS. . The figures are weighted averages. Figures in the parenthesis are the standard errors. The mean values are significant at 5% level. The high burden States are Bihar, Uttar Pradesh, West Bengal, Chhattisgarh, Jharkhand and Orissa. All figures are weighted using the multiplier formulated by NSS.

It is evident in Table 3 that the institutional arrangements of the economically backward regions of the six major states — Bihar, Uttar Pradesh, West Bengal, Chhattisgarh, Jharkhand, and Orissa — show significantly high share of income loss for all the quintile groups in the rural and urban areas compared to all other states and union territories taken together⁴. It is interesting to note that unlike other quintile groups the poorest of the poor group of the population having the worst household amenities suffer from higher burden of income loss in the urban areas compared to their rural counterparts for both categories of states and union territories. It raises the need for the formulation and implementation of a public health programme like NRHM in the urban areas. Nonetheless, the rural-urban gap in the burden of income loss in the other states is not very wide among the poor, though in the backward states the poorest group with best household amenities suffers from a significantly low burden in the urban areas than those in the rural areas. It indicates that other factors, like the awareness created by various channels of information in urban areas, might have a role in determining the health status and thus its economic burden. Moreover, the type of occupation and existing contracts also play important roles in determining wages and therefore, loss of wages.

Determinants of the Burden of Income Loss Due to Ailment: A TOBIT Analysis: In addition to the descriptive analysis, a Tobit model was used to examine the factors that determine the burden of income loss due to health reasons at the household level. The rationale for choosing a TOBIT model as the most appropriate tool of our analysis was that the variable of interest, namely share of loss of income due to ailment, shows positive value as well as zero. The zero occurs for the true absence of loss of income and also for the under-reporting or absence from the work place. For example, an individual not taking part in the labour force is expected to report zero loss of income due to illness; however, that there is no loss of income does not indicate that the individual was not ill or it is because

⁴ The detailed table is given in Appendix B.

of some contract between her and her employee. Hence, the loss of income often depends on the fact that is unobservable or latent.

Let y^* be the optimal loss of income (y) due to ailment for the i^{th} household in the absence of any health disorder. Let us suppose, the optimal loss of income y at the i^{th} household is constrained to exceed some floor τ_i . Therefore, if there is any illness, the loss of household's income will be:

$$y_i = \begin{cases} y_i^*, & \text{if } y_i^* = \tau_i \\ \tau_i, & \text{otherwise} \end{cases}$$

The threshold τ_i is known to be zero. We can therefore, re-state the model in terms of the difference $y_i - \tau_i$:

$$y_i - \tau_i = \begin{cases} y_i^* - \tau_i, & \text{if } y_i^* - \tau_i = \\ 0, & \text{otherwise} \end{cases}$$

For each observation $i=1, 2, 3, \dots, n$, the dependent variable is defined by:

$$y_i = \begin{cases} y_i^*, & \text{if } y_i^* = \tau_i \\ \tau_i, & \text{otherwise} \end{cases} \quad (1)$$

Where $y_i^* = x_i b + u_i$, b is a vector of unknown parameters containing K elements, x_i is a vector comprising observations corresponding to the elements of b , and the τ_i -s are the known thresholds. It is assumed that the error terms (u_i) are independent having conditional density functions f and distributions F , which are the same for each u_i , upto a scaling parameter s :

$$u_i/s \sim f$$

The distribution of y_i is given by:

$$\begin{aligned} Pr(y_i = \tau_i) &= Pr(y_i^* < \tau_i) \\ &= Pr(u_i/s < \tau_i/s - x_i b/s) \\ &= F(\tau_i/s - x_i b/s) \end{aligned}$$

Its density function on the interval (τ_i, ∞) is:

$$[1/s] f(y_i - x_i b)/s$$

If all the y_i -s have a constant, known value, τ , and if the model $y_i^* = x_i b + u_i$ includes a constant term, we can re-state Equation (1) by defining a new dependent variable $y_i = y_i - \tau$:

$$y_i = \begin{cases} y_i^*, & \text{if } y_i^* = 0 \\ 0, & \text{otherwise} \end{cases} \quad (2)$$

$$\begin{aligned} \text{With } y_i^* &= x_i b - ? + u_i \\ &= x_i b + u_i \end{aligned}$$

Here the threshold values are identically equal to zero.

In order to estimate the burden of income loss due to ailment at the household level we posit the model as expressed in Equation (2). We construct a variable, namely, burden of annual income loss due to ailment by calculating the share of total annual loss of household income due to ailment to the total annual income of the household. The loss of income due to ailment reflects loss of labour productivity because of health reasons. Therefore, the burden of income loss due to illness reasonably depends on an array of individual and household level factors, such as age, sex, education, health status, household level amenities that influence the health status of household members, in addition to the background characteristics such as social group and religion of the household. The household's annual income loss due to ailment as a share of the household's annual expenditure (y_i) is taken as dependent variable. The model specified below (equation 1) is estimated.

$$\ln y_i = b_{\alpha} + b_{1i} B_i + b_{2i} C_i + b_{3i} P_i + b_{4i} T_i + D_{5i} H_i + D_{6i} S_i \quad (3)$$

$i = 1, 2, 3, \dots, n$ observations

Where B_i is the vector of common individual level explanatory variables such as age, marital status and educational status aggregated at the household level. C_i is the vector of household characteristics, e.g., social group, religion, female to male ratio at the adult working age group in the household; P_i is the vector of health characteristics such as whether or not any household member was ill before the date of survey and the average number of days the household members spent in restricted activities. T_i represents the vector of household type by occupation and H_i is the amenities index that shows the availability and accessibility of basic household amenities that influence the health status of the members of the household. S_i is the dummy for the region comprising Bihar, Uttar Pradesh, Chhattisgarh, Jharkhand, Orissa and West Bengal (definitions of the variables used in the analysis are given in Table 3, Appendix A).

The estimation results are documented in Tables 4 and 5. Clearly, different factors have a bearing on the burden of income loss due to ailment. The estimation has been done separately for the poorest of the poor group of population at the rural, urban and all-India levels as well as for the richest 20 per cent of the population in rural, urban and all over India. For example, the sex combination in the adult working age group has a significant impact on the burden of household income loss due to ailment. It increased the burden of income loss due to ailment across rural and urban areas for the poorest and richest groups of individuals. It may indicate a problem of reporting income loss because women who do not participate in the labour force for some other reason are also likely to report absence from work place, hence the loss of income. In reality, it may be largely due to different local labour market features such as availability of work, type of contract, wage rates, etc. However, it also implies that female to male health risks in terms of income loss may be minimised by diversifying it among the family members. The current demographic condition with a low level of fertility, therefore, raises the need for more effective child health policies to comply with this risk. Households with lower levels of average education suffer from higher burden of income loss due to ailment. With education

level, the chances of getting a job in non-manual sector increases, which leads to a lower loss of income due to ailment. This is also reflected in other coefficients, which show that by being casual and other labour the chances of losing income for ill health increases particularly in the urban areas. Individuals belonging to scheduled tribes, scheduled castes and other backward castes suffer from significantly higher burden of income loss due to ailment than those belonging to other castes particularly in the rural areas of India. However, the degree of loss is highest for SCs and OBCs among the poorest group in rural areas, though among the rich, the heaviest burden is borne by the STs.

It is interesting to note that the availability and accessibility of household level amenities evidently reduced the burden of income loss due to ailment as it improved the health status of the household members among all group of individuals except the poorest of the poor in rural areas. It indicates the need for further investigation as the existing data does not provide information on quality of household amenities. Keeping in mind that public policies must ensure the provision of basic amenities at the household level, we may suggest that an evaluation of the quality of the existing provisions and their implementation is needed. It is argued in the theory of health economics that an action taken by an individual (e.g., ensuring clean water, using clean fuel for cooking purpose, using latrine and proper drainage system, etc.) generates direct health benefits for other individuals through reduced rates of diseases (positive externality). It supports the need for effective interventions targeted at overall improvement of sanitation that determines health and controls communicable diseases not only for an individual but also for the community as a whole. It warrants further ground level investigation primarily because it is very difficult to be sure about the quality of these health-influencing factors without scientific examination. Effect of the quality of water is particularly very difficult to record. For example, the effect of poor quality drinking water, contaminated with deadly poisonous elements like arsenic, is not instantaneous; it affects the health of individuals slowly over a substantial period of time and such water cannot be purified by boiling or other filtration processes. Therefore, it would be more appropriate for policy-making purposes to use information based on scientific examination of quality of drinking water. It is interesting to note that the current health status (i.e., whether or not an individual was ill on the day before the survey) and number of days spent in quarantine matter significantly for the high burden of income loss. However, the current health status does not induce the loss of income for the rich in urban areas. It implies that these households may have certain coping processes to deal with illness. Whatever the reason, it warrants further research and field level investigation to inquire about the perception of individuals' health status and its impact on productivity and wealth, because "in many cases, illness is not something that just happens to an individual. We are more likely to remain healthy if we take care of ourselves. People who live prudently tend to live longer and to avoid disability. The best hope for many people who are seeking to maintain or improve health is to adopt healthier lifestyle" (Wikler, 2004). In addition, awareness of disease and health plays a very important role in determining the health-seeking behaviour, labour supply and loss of income due to health reasons. As expected, the number of restricted days being a more objective indicator of health status shows an increasing impact on the burden of income loss for all groups of individuals with the highest toll among the poorest group in rural areas. We have already found that some backward states, specifically Bihar, Uttar Pradesh, Chhattisgarh, Jharkhand, Orissa and West Bengal, cover a contiguous

belt of high income burden because of ill-health. The state dummy variable also shows a robust and significant effect on the burden of income loss at the household level. The marginal effect is the highest for poorest in rural areas, which clearly indicates failure of those states in improving and ensuring the quality of the health of individuals in this region. Irrespective of the sector, that is rural or urban, however, these states evidently cause more burden of income loss at the household level. It raises need for further investigation to identify the nature of institutional failure in these states. It might be a failure to ensure sufficient resources for public health activities or failure to provide proper interventions in the form of price subsidies to encourage and spread health care services or failure to ensure public provision of such services. It reflects the findings of some other studies (Chandrasekhar, *et al.* 2006) conducted in different context where we may argue that it can also be failure in terms of intervention in the form of licensing of health care providers, limits on advertising, insistence on professional norms that prohibit low quality, etc. This highly significant robust coefficient indicates an examination of the role of the state in ensuring efficiency and equity of health care services and thus, the health status of individuals.

From the regression analyses it is clear that there different socio-economic and demographic factors influence loss of household income due to ailment. The explanations lie at the core of the developmental issues. Land-based livelihoods, low level of education, prevalence of manual labour, lack of information and awareness about health issues as indicated by the absence of latrines, proper drainage systems, etc., contribute significantly to the burden of income loss due to ailment.

Table 4: Estimation Results – 1

Specification: TOBIT model												
Dep. Variable	Log of share of annual household's income loss											
	Model 1: Poorest						Model 2: Richest					
	Specification 1: Rural		Specification 2: Urban		Specification 3: All India		Specification 4: Rural		Specification 5: Urban		Specification 6: All India	
Independent variables	Coeff (t – value)	marginal effects (Z-value)	Coeff (t – value)	marginal effects (Z-value)	Coeff (t – value)	marginal effects (Z-value)	Coeff (t – value)	marginal effects (Z-value)	Coeff (t – value)	marginal effects (Z-value)	Coeff (t – value)	marginal effects (Z-value)
Age	0.059 (0.79)	0.06 (0.83)	0.194* (1.84)	0.194* (1.84)	0.124** (2.01)	0.124** (2.01)	0.110 ^w (1.58)	0.110 ^w (1.60)	0.186 (1.06)	0.186 (0.18)	0.149** (2.28)	0.15** (2.28)
Age squared	-0.002 ^w (-1.5)	-0.002 ^w (-1.62)	-0.004** (-2.58)	-0.004** (-2.58)	-0.003*** (-3.02)	-0.003*** (-3.02)	-0.003*** (-3.32)	-0.003*** (-3.42)	-0.005** (-2.18)	-0.005** (0.002)	-0.00*** (-4.55)	-0.00*** (-4.55)
Average years of education	-0.008 (-0.07)	-0.01 (-0.07)	-0.285** (-2.5)	-0.285** (-2.5)	-0.193** (-2.42)	-0.193** (-2.42)	-0.347*** (-4.89)	-0.347*** (-4.88)	-0.46*** (-3.00)	-0.46*** (0.15)	-0.50*** (-7.89)	-0.50*** (-7.89)
Ill before the date of survey	0.926** (2.24)	0.93** (2.27)	0.052 (0.1)	0.052 (0.1)	0.673** (2.05)	0.673** (2.05)	0.332 (0.77)	0.332 (0.78)	-0.642 (-0.54)	-0.642 (1.18)	0.106 (0.25)	0.11 (0.25)
Number of days restricted because of ailment	0.135*** (5.8)	0.14*** (5.48)	0.145*** (5.24)	0.145*** (5.24)	0.139*** (7.78)	0.139*** (7.78)	0.179*** (8.97)	0.179*** (8.86)	0.137*** (3.32)	0.14*** (0.04)	0.167*** (9.57)	0.17*** (9.57)
Female to male ratio at the adult age group	0.539* (1.85)	0.54* (1.84)	0.660** (2.03)	0.660** (2.03)	0.611*** (2.82)	0.611*** (2.82)	0.812*** (3.24)	0.812*** (3.22)	1.077 ^w (1.68)	1.08 ^w (0.64)	0.941*** (4.02)	0.94*** (4.02)
Never married	0.015 (0.01)	0.02 (0.01)	-2.495 ^w (-1.55)	-2.495 ^w (-1.55)	-1.027 ^w (-0.99)	-1.027 ^w (-0.99)	-1.166* (-1.7)	-1.166* (-1.72)	-5.16*** (-3.71)	-5.16*** (1.39)	-2.26*** (-3.69)	-2.26*** (-3.69)
Divorced or separated	-1.771*** (-3.96)	-1.77*** (-4.05)	-1.72*** (-3.02)	-1.72*** (-3.02)	-1.799*** (-5.1)	-1.799*** (-5.1)	-1.056** (-2.51)	-1.056** (-2.57)	-2.482** (-2.38)	-2.48** (1.04)	-1.34*** (-3.43)	-1.34*** (-3.43)
ST household	1.354* (1.81)	1.35* (1.85)	0.748 (0.51)	0.748 (0.51)	0.804 ^w (1.32)	0.804 ^w (1.32)	4.274*** (5.84)	4.274*** (5.68)	7.519*** (3.27)	7.519*** (2.30)	4.449*** (6.21)	4.45*** (6.21)
SC household	2.518*** (3.7)	2.52*** (3.8)	-0.150 (-0.2)	-0.150 (-0.20)	1.399*** (2.83)	1.399*** (2.83)	0.796 ^w (1.39)	0.796 ^w (1.37)	-0.312 (-0.16)	-0.312 (2.01)	1.264** (2.27)	1.26** (2.27)
OBC household	2.007*** (3.26)	2.01*** (3.39)	0.189 (0.31)	0.189 (0.31)	1.135*** (2.65)	1.135*** (2.65)	1.012** (2.52)	1.012** (2.55)	1.007 (0.95)	1.007 (1.06)	1.174*** (3.12)	1.17*** (3.12)

Muslim household	-0.823 ^w (-1.14)	-0.82 ^w (-1.19)	-0.661 (-1.05)	-0.661 (-1.05)	-0.751 ^w (-1.59)	-0.751 ^w (-1.59)	-1.897 ^{***} (-3.21)	-1.897 ^{***} (-3.26)	-0.782 (-0.44)	-0.782 (1.78)	-1.66 ^{***} (-2.87)	-1.66 ^{***} (-2.87)
Christian household	-1.269 (-0.84)	-1.27 (-0.87)	2.384 ^w (1.41)	2.384 ^w (1.41)	0.146 (0.12)	0.146 (0.12)	-0.543 (-0.80)	-0.543 (-0.77)	-1.205 (-0.62)	-1.205 (1.95)	-0.068 (-0.11)	-0.068 (-0.11)
Households belonged to other religion	0.518 (0.44)	0.52 (0.42)	0.884 (0.49)	0.884 (0.49)	0.685 (0.69)	0.685 (0.69)	-3.261 ^{***} (-4.38)	-3.261 ^{***} (-4.59)	0.300 (0.18)	0.300 (1.65)	-2.31 ^{***} (-3.32)	-2.31 ^{***} (-3.32)
Self employed in non- agriculture	-0.676 (-1.14)	-0.68 (-1.11)	1.838 ^{***} (2.88)	1.838 ^{***} (2.88)	0.307 (0.77)	0.307 (0.77)	-1.950 ^{**} (-2.90)	-1.950 ^{**} (-2.57)	7.296 ^{***} (8.01)	7.30 ^{***} (0.91)	3.418 ^{***} (6.75)	3.42 ^{***} (6.75)
Other or casual labour	-1.149 [*] (-1.83)	-1.15 [*] (-1.81)	1.355 [*] (1.90)	1.355 [*] (1.90)	-0.188 (-0.43)	-0.188 (-0.43)	-2.669 ^{***} (-3.60)	-2.669 ^{***} (-3.28)	9.099 ^{**} (2.7)	9.10 ^{**} (3.37)	2.228 ^{***} (3.22)	2.23 ^{***} (3.22)
Self employed in agriculture	-1.90 ^{***} (-4.09)	-1.90 ^{***} (-4.06)	NA	NA	-1.135 ^{**} (-2.59)	-1.135 ^{**} (-2.59)	-2.755 ^{***} (-4.62)	-2.755 ^{***} (-4.03)	NA	NA	2.167 ^{***} (4.21)	2.17 ^{***} (4.21)
Other workers	-4.77 ^{***} (-4.92)	-4.77 ^{***} (-5.38)	-4.07 ^{***} (-2.65)	-4.07 ^{***} (-2.65)	-4.341 ^{***} (-5.27)	-4.341 ^{***} (-5.27)	-6.776 ^{***} (-9.54)	-6.776 ^{***} (-8.77)	-2.189 ^w (-1.26)	-2.189 ^w (1.73)	-1.866 ^{***} (-3.21)	-1.87 ^{***} (-3.21)
State dummy	1.213 ^{**} (3.00)	1.21 ^{**} (2.99)	0.388 (0.63)	0.388 (0.63)	0.914 ^{***} (2.72)	0.914 ^{***} (2.72)	0.193 (0.33)	0.193 (0.32)	0.459 (0.37)	0.459 (1.23)	-0.114 (-0.21)	-0.114 (-0.21)
Amenities index	0.425 (1.71)	0.43 (0.085)	-0.55 ^{***} (-2.62)	-0.55 ^{***} (-2.62)	-0.405 ^{***} (-2.88)	-0.405 ^{***} (-2.88)	-0.421 ^{**} (-2.58)	-0.421 ^{**} (-2.59)	-0.239 (-0.35)	-0.239 (0.69)	-1.00 ^{***} (-6.75)	-1.00 ^{***} (-6.75)
Constant	-12.85 ^{***} (-7.26)		-12.68 ^{***} (-5.95)		-13.22 ^{***} (-9.84)		-9.071 ^{***} (-6.18)		-18.23 ^{***} (-4.71)		-13.25 ^{***} (-9.80)	
/Sigma	9.006		9.239		9.15		9.076		12.546		9.82	
Number of obs.	2905		1950		4855		3843		1919		5762	
Number of left-censored obs.	1518		1108		2626		2299		1589		3888	
Number of uncensored obs.	1387		842		2229		1544		330		1874	
F-values	8.620		7.23		13.37		30.380		12.57		54.18	
Pseudo R-square	0.0348		0.0472		0.0440		0.0346		0.0482		0.0490	

Note: t-values and z-values are in parenthesis. ^w indicates weakly significant, ^{***} indicates significant at less than 1% level, ^{**} indicates less than 5 % level of significance and ^{*} indicates less than 10% level of significance.

Table 5: Estimation Results – 2

Specification: TOBIT model						
Dependent variable	Log of share of annual household's income loss					
	Rural		Urban		All India	
Independent variables	Coeff (t - value)	marginal effects (Z-value)	Coeff t - value	marginal effects Z-value	Coeff t - value	marginal effects (Z-value)
Age	0.070** (2.29)	0.070** (2.29)	0.163*** (2.84)	0.163*** (2.84)	0.130*** (4.49)	0.130*** (4.49)
Age squared	-0.002*** (-5.06)	-0.002*** (-5.06)	-0.004*** (-5.03)	-0.004*** (-5.03)	-0.003*** (-7.81)	-0.003*** (-7.81)
Average years of education	-0.164*** (-4.3)	-0.164*** (-4.3)	-0.354*** (-6.78)	-0.354*** (-6.78)	-0.328*** (-10.93)	-0.328*** (-10.93)
Ill before the date of survey	0.604*** (3.34)	0.604*** (3.34)	0.471 ^w (1.45)	0.471 ^w (1.45)	0.589*** (3.64)	0.589*** (3.64)
Number of days restricted because of ailment	0.175*** (17.13)	0.175*** (17.13)	0.157*** (10.32)	0.157*** (10.32)	0.170*** (20.33)	0.170*** (20.33)
Female to male ratio at the adult age group	0.625*** (5.3)	0.625*** (5.3)	1.129*** (6.24)	1.129*** (6.24)	0.807*** (8.27)	0.807*** (8.27)
Never married	-1.393*** (-3.54)	-1.393*** (-3.54)	-3.586*** (-5.63)	-3.586*** (-5.63)	-2.128*** (-6.18)	-2.128*** (-6.18)
Divorced or separated	-1.373*** (-7.35)	-1.373*** (-7.35)	-1.679*** (-5.29)	-1.679*** (-5.29)	-1.527*** (-9.32)	-1.527*** (-9.32)
ST household	1.472*** (4.63)	1.472*** (4.63)	1.974*** (2.73)	1.974*** (2.73)	1.476*** (5.03)	1.476*** (5.03)
SC household	1.479*** (5.81)	1.479*** (5.81)	0.679 ^w (1.55)	0.679 ^w (1.55)	1.474*** (6.73)	1.474*** (6.73)
OBC household	1.142*** (5.6)	1.142*** (5.6)	0.724** (2.25)	0.724** (2.25)	1.029*** (5.92)	1.029*** (5.92)
Muslim household	-0.984*** (-3.69)	-0.984** (-3.69)	-0.049 (-0.13)	-0.049 (-0.13)	-0.658*** (-2.97)	-0.658*** (-2.97)
Christian household	-0.618 ^w (-1.43)	-0.618 ^w (-1.43)	1.782** (2.67)	1.782** (2.67)	0.408 (1.11)	0.408 (1.11)
Households belonging to other religion	-1.484*** (-3.34)	-1.484*** (-3.34)	-0.282 (-0.38)	-0.282 (-0.38)	-0.873** (-2.21)	-0.873*** (-2.21)
Self-employed in non-agricultural sector	-1.132*** (-4.13)	-1.132*** (-4.13)	3.930*** (12.52)	3.930*** (12.52)	1.428*** (7.39)	1.428*** (7.39)
Other or casual labour	-0.97*** (-3.33)	-0.971*** (-3.33)	3.474*** (7.55)	3.474*** (7.55)	1.111*** (4.74)	1.111*** (4.74)
Self-employed in agricultural sector	-1.879*** (-8.37)	-1.879*** (-8.37)			0.338* (1.72)	0.338* (1.72)
Other workers	-5.562*** (-17.08)	-5.562*** (-17.08)	-2.942*** (-4.26)	-2.942*** (-4.26)	-3.267*** (-11.1)	-3.267*** (-11.1)
State dummy	0.424** (2.08)	0.424** (2.08)	0.202 (0.52)	0.202 (0.52)	0.258 ^w (1.42)	0.258 (1.42)
Amenities index	-0.030 (-0.35)	-0.030 (-0.35)	-0.951*** (-7.51)	-0.951*** (-7.51)	-0.889*** (-14.15)	-0.889 (-14.15)
Constant	-10.78*** (-16.39)		-15.30*** (-13.86)		-13.50*** (-23.71)	
/Sigma	9.074		10.46		9.55	
Number of observations	16576		9563		26139	
Number of left-censored observations	9205		6730		15935	
Number of uncensored observations	7371		2833		10204	
F-values			63.94		136.65	
Pseudo R-square	0.0388		0.0569		0.0467	

Note: t-values and z-values are in parenthesis. ^w indicates weakly significant, *** indicates significant at less than 1% level, ** indicates less than 5 % level of significance and * indicates less than 10% level of significance.

Health as a Focus in Public Policy: Implications from the Analysis

The health policy in India, as rightly mentioned by Narayanan (Narayanan, 2011), has always been a product of the complex political process. However, there is a straightforward way to make health an element of public policy because it is one of the basic human rights apart from being an element of welfare. The reason lies with the status of health as a "special good" (Anand, 2002) with intrinsic and instrumental value. From the empirical result, it is very clear that the degree of impact of the different explanatory factors on the burden of income loss due to ill health is remarkably high. The factors that contribute to this burden have a significant impact in most cases. It brings the question of ensuring equity in health status particularly for individuals in the working age group. Loss of income due to ailment is not only an economic burden, it also causes loss of vigour and happiness. Costs of ill health go beyond the out-of-pocket expenditure, loss of man-days and labour productivity or income, which have often been discussed in the literature. More than that, it involves emotional suffering leading to an unhappy life for individuals irrespective of the fact whether she participates in labour force or not. Thus, health becomes a basic human right for every individual. Health has to be ensured for all through appropriate policies and legislations.

The recent debate regarding inclusion of caste in Census 2011 is significant even in modern India, where the development has evidently been slogan-based (India Shining) but not action-based (Subramanian, 2011). In line with the studies by Sonalde Desai and Amaresh Dubey in 2011, this present paper also clearly indicates that the broad categories of caste differentiation (ST, SC, OBC and Others) have a significant bearing on the dimension of well-being reflected in the burden of income loss due to ill health. It may collate with the continued persistence of caste disparities in health as is found in case of education, income and social networks.

The role of the state is important because there is evidence of market failure in the externality and asymmetric information between two agents (supply and demand for health care services). In addition, return to health is often not visible; therefore, it would not be of the interest to the market mechanism that basically acts through competition. In a society where justice is not secured in terms of equity in basic human rights like health or education, the market mechanism is not appropriate. We bring the issue of justice in securing health because the burden of ill health be it economic or non-economic, leads to further deprivation and throws the individuals deeper into the vortex of poverty. To elaborate further, the inequalities in health reflect inequalities in people's capability to function, which is often termed as "positive freedom" (Berlin, 1969). This is a denial of "equality of opportunity" because it restrains individuals from doing or becoming what she can do or be (Anand, 2002). Justice, meaning fairness, is explained by Rawls through the principle of "fair equality of opportunity" which argues in favour of an individual's holding of primary goods. The idea is extended further to include fair access to health care and other health related provisions. Given our discussion regarding the conceptual framework, the Rawlsian idea of justice reflected in his "fair equality of opportunity" principle in the space of capabilities, as argued by Anand (Anand, 2002) brings the direct requirement of justice to reduce the inequalities in health care provisions and outcomes. It is often argued, "Institutions cannot but play a significant instrumental role in the pursuit of justice" (Sen, 2009). Though there are public policies and government schemes to improve sanitation and health at the household level, the empirical analysis shows that there is institutional failure in providing basic household level amenities, apart from the social stratification. We may argue that behaviour, attitude, sociological stratification and in many

cases sociological attributes, are responsible for the failure of the existing policies. It can be further argued, "together with the determinants of individual and social behaviour, an appropriate choice of institutions has a critically important place in the enterprise of enhancing justice" (Sen, 2009). It may not be possible or feasible for the government as an institution to reach the individual and frame policies to suit the wide variations in individual or social behaviour and attitudes that change for historical, socio-cultural reasons or, in many cases, with geography. Hence, local⁵ institutional arrangements in the form of civil society organisations or NGOs may be successful in reaching the common people and achieving the target of public policies that ensure health, sanitation and other health enhancing factors.

Conclusion

The descriptive analysis in this paper indicates the vulnerability of individuals belonging to lowest income group and suffering the worst basic household amenities and highest burden of income loss due to ailment. The high loss of income due to illness among the urban poor raises the need for a widely implemented public health programme like NRHM even in urban areas. Certain states show a geographic contiguity of high burden of income loss of households due to health reasons. The estimation identifies the determinants of income loss for the poorest and richest groups in rural and urban areas of India. It shows that different development initiatives play key roles in explaining the economic loss of health at the household or individual level. In informal and agricultural labour market specifically, poor education, household health, environmental factors such as absence of latrine facility, inaccessibility to safe drinking water and clean source of fuel for cooking have a bearing on the economic burden of loss of household income due to ill health. The demographic and social factors, namely household adult sex ratio, education, marital status and social group, appear to be consistently robust and significant for both groups of individuals, which indicates the importance of population policies in improving the health of the citizens of our country. It was suggested (Narayanan, 2011) by several studies conducted in countries like Thailand and Indonesia that if important local cultural practices and biases are taken into account in process of policymaking it would result in dramatic changes. Hence, socio-cultural practices reflected in attitudes and behaviours need to be considered while framing the policies for specific development goals. However, the high magnitude of marginal effects of certain determinants (e.g., amenities index) calls for subsidies, free provision or pricing based on the marginal utilities.

The present analysis assumes importance because health has traditionally received less priority in central and state budgets of India. Keeping the recent Union Budget 2010-2011 in mind, wherein it was announced that national health programmes have become less important and the results indicate inequality in ensuring the health of the people. The burden of poor health is significantly high across the groups belonging to the lowest of the income groups. Undoubtedly, health is not only a part and parcel of human capital, it is a basic human right, so its importance needs to be valued beyond the purview of economic costs. It is clear that the developmental issue plays a role in the mechanism through which health assumes importance in the economic and labour market outcomes. Since it stems from the

⁵ It is clearly argued in philosophy that poverty has local explanations. "The causes of the wealth of a people and the forms it takes lie in their political culture and in the religious, philosophical and moral traditions that support the basic structure, as well as in the industriousness and cooperative talents of its members, all supported by their political virtues....Crucial also is the country's population policy" (Rawls, 1999).

awareness of the people there will be a tendency to demand for better health facilities. Policies framed with these factors in mind will improve the health status of individuals irrespective of sex. Finally, provision of facilities to ensure good health deserves equal concern and attention like any other human rights.

Nevertheless, the present study considers the household and individual level factors and tries to capture the supply side factors only through the information on access to several household amenities. The major supply side health related factors such as the deficiency of physical infrastructure, shortage of equipment and medicines, inadequate manpower etc., are not considered in the present analysis. With the completion of National Rural Health Mission (NRHM) programme in 2012, there is hope for significant improvement in the health status of the rural poor as reflected in loss of income due to ill health. Many evaluation studies have been highlighting the failures in the implementation of the appropriate programmes at many levels. However, in 2012 when the NRHM programme is completed, the health status of rural poor may further be examined to see if there has been any significant improvement resulting in reduced out-of-pocket expenditure and loss of productivity as reflected in the income.

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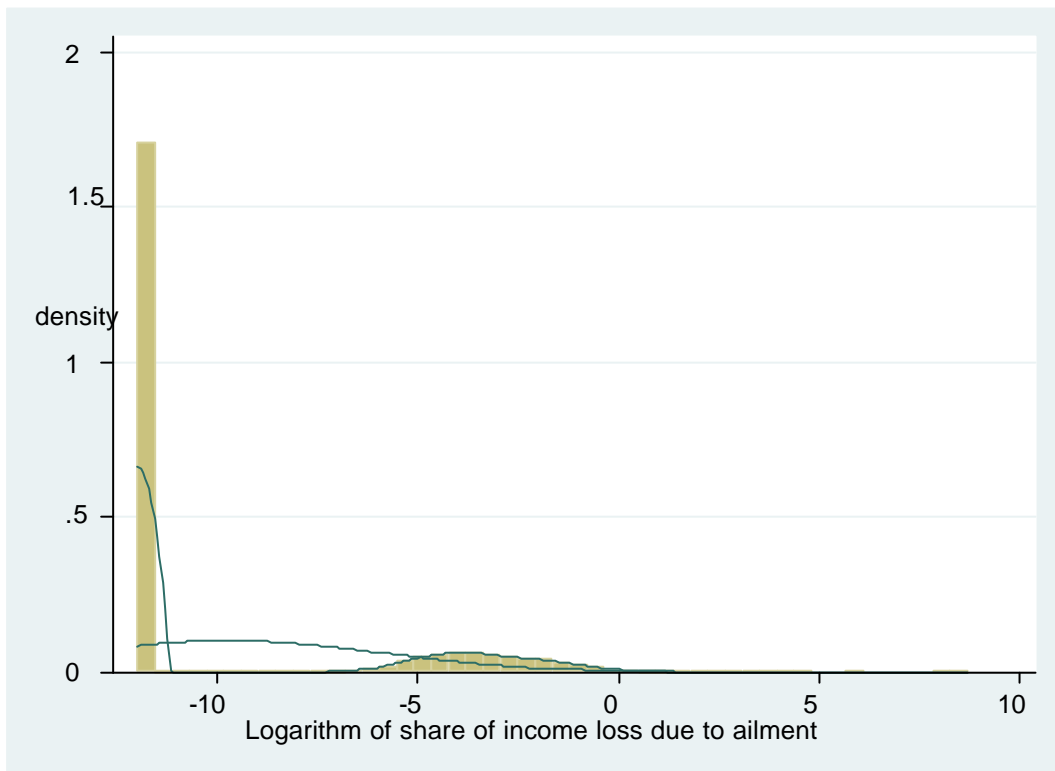
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Appendix A

Chart1: Distribution of Share of Annual Loss of Income due to Ailment to the Total Annual Income at the Household Level



Appendix B

Average share of annual income loss due to ailment by each quintile across the high burdened and other states

Average burden of annual income loss										
Rural										
	Poorest income group		Poor income group		Middle income group		Rich income group		Richest income group	
	State 1	State 0	State 1	State 0	State 1	State 0	State 1	State 0	State 1	State 0
	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)
Worst amenities	0.261 (0.050)	0.165 (0.014)	0.255 (0.031)	0.194 (0.027)	0.282 (0.035)	0.200 (0.023)	0.311 (0.087)	0.117 (0.012)	0.206 (0.031)	0.118 (0.013)
Below moderate amenities	3.522 (2.506)	0.209 (0.058)	0.308 (0.164)	0.091 (0.011)	0.153 (0.024)	0.137 (0.017)	0.762 (0.862)	0.091 (0.012)	0.153 (0.073)	0.102 (0.015)
Moderate amenities	0.233 (0.042)	0.907 (2.420)	0.347 (0.055)	0.084 (0.008)	0.129 (0.028)	0.150 (0.017)	0.158 (0.033)	0.072 (0.008)	0.122 (0.027)	0.132 (0.012)
Better amenities	0.116 (0.024)	0.149 (0.023)	0.133 (0.018)	0.084 (0.014)	0.148 (0.017)	0.815 (0.252)	0.163 (0.023)	0.122 (0.015)	0.148 (0.042)	0.075 (0.005)
Best amenities	0.220 (0.058)	0.255 (0.046)	0.208 (0.031)	0.120 (0.013)	0.105 (0.027)	0.129 (0.018)	0.070 (0.014)	0.078 (0.016)	0.038 (0.008)	0.078 (0.011)
Urban										
	Poorest		Poor		Middle income group		Rich		Richest	
	State 1	State 0	State 1	State 0	State 1	State 0	State 1	State 0	State 1	State 0
	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)	mean (std. error)	Mean (std. error)	mean (std. error)
Worst amenities	0.318 (0.064)	0.230 (0.089)	0.109 (0.022)	0.077 (0.008)	0.090 (0.029)	0.160 (0.024)	0.019 (0.022)	0.095 (0.018)	0.003 (0.005)	0.027 (0.021)
Below moderate amenities	0.148 (0.022)	0.229 (0.914)	0.146 (0.028)	0.073 (0.010)	0.208 (0.046)	0.056 (0.009)	1.805 (1.100)	0.030 (0.008)	0.069 (0.060)	0.124 (0.028)
Moderate amenities	0.156 (0.066)	0.974 (5.236)	0.037 (0.020)	0.029 (0.011)	0.042 (0.020)	0.041 (0.005)	0.014 (0.011)	0.036 (0.009)	0.053 (0.060)	0.071 (0.043)
Better amenities	0.166 (0.044)	0.096 (0.025)	0.029 (0.010)	0.050 (0.011)	0.076 (0.018)	0.056 (0.009)	0.043 (0.027)	0.021 (0.004)	0.016 (0.007)	0.034 (0.018)
Best amenities	0.0001 (0.000)	0.301 (0.159)	0.032 (0.053)	0.052 (0.013)	0.037 (0.067)	0.056 (0.019)	0.125 (0.069)	0.019 (0.006)	0.076 (0.026)	0.031 (0.008)

Note: State 1 includes states with overall high burden of income loss due to ailment (Bihar, Uttar Pradesh, Orissa, Chhattisgarh, Jharkhand and West Bengal). State 0 includes all other states. Figures are weighted based on the multiplier formulated by NSS.

Appendix C

Definition of the variables used in the analysis

Variables	Definitions	Expected signs
Dependent variables		
Share of Loss of household income due to ailment to the total income of the household	Quantitative continuous variable	
Common explanatory variables at the individual level		
Age	Quantitative continuous variable (mean age of the household members)	Positive
Years of education	Quantitative continuous variable (average years of education at the household level)	Negative
Marital status: never married	= 1 if any member never married; 0 otherwise	Negative
Dviorcee/widow/separated Currently married (ref. category)	= 1 if single; 0 otherwise = 1 if currently married, 0 otherwise	Negative
Health characteristic		
Restricted days	Quantitative continuous variable (average number of days the household members spent in restricted activities due to ailment)	Positive
Whether ill on the day before the survey: dummy	= 1 if suffers from any illness during last 15 days; 0 otherwise	Positive
Household health environmental factors		
Household amenities	Quantitative variable (higher value reflects better availability of basic amenities, which consist of latrine, drainage and facility of safe drinking water, as well as clean fuel for cooking and pucca house structure)	Negative
Other household characteristics		
Social group: other(reference category): dummy	= 1 if other; 0 otherwise	
ST: dummy SC: dummy	= 1 if ST; 0 otherwise = 1 if SC; 0 otherwise	Positive
OBC: dummy	= 1 if OBC; 0 otherwise	Positive
Adult Sex ratio	Quantitative variable, ([no. of female in working age group/no. of male in working age group]* 1000)	Positive
Religion: Hindu (reference category): dummy Muslim: dummy Christian: dummy	=1 if Hindu, 0 otherwise =1 if Muslim, 0 otherwise =1 if Christian, 0 otherwise	Negative Negative
Other: dummy	=1 if any other religion, 0 otherwise	Negative
Self employed in non-agriculture household: dummy	= 1 if household is self employed in non-agriculture in rural areas and self employed in urban areas; 0 otherwise	Negative in rural areas Positive in urban areas
Agriculture/regular labour household: dummy (reference category)		
Self-employed in agriculture households: dummy	= 1 if self employed in agriculture in rural areas; 0 otherwise	Negative
Casual labour households: dummy	= 1 if casual labour; 0 otherwise	Negative in rural areas, positive in urban areas
Other households: dummy	= 1 if other household types; 0 otherwise	Negative
States: dummy	= 1 if Bihar/Uttar Pradesh/ Chhattisgarh/ Jharkhand/ Orissa/ West Bengal; 0 otherwise	Positive

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