

Does Health Insurance Ensure Equitable Health Outcomes? An Analysis of Hospital Services Usage in Urban India

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Abstract

In this paper, we examine the relationship between socio-economic status (SES) and the usage of in-patient services, and analyze the impact of introducing health insurance in India – a major developing country with poor health outcomes. In contrast to results of similar works undertaken for developed countries, our results reveal that the positive relation between usage of in-patient services and SES persists even in the presence of health insurance. This implies that health insurance is unable to eliminate the inequities in accessing healthcare services that stem from disparities in SES. In fact, insurance aggravates inequity in the healthcare market. The study is based on unit-level data from the 2005–06 Morbidity and Health Care Survey undertaken by National Sample Survey Organization.

Introduction

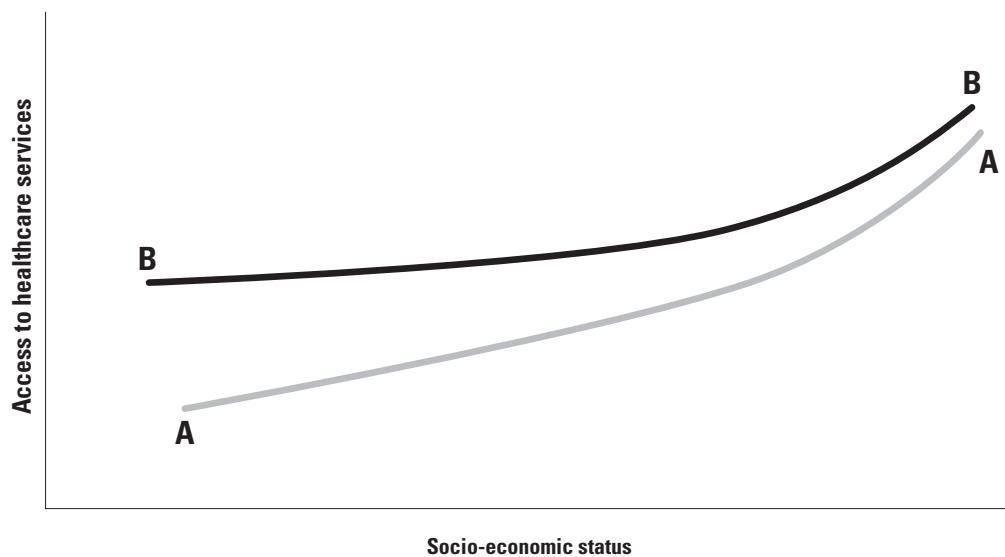
Although access to healthcare services is relatively universal in developed countries, the situation is different for developing countries. In most of such countries, the population relies exclusively on out-of-pocket (OOP) payments, which is inequitable, inefficient and less accountable than other methods of financing healthcare expenses (Visaria and Gumber 1994). The picture is no different in India, with nearly 80% of healthcare expenditure borne by individuals. A recent study estimated that healthcare-seeking behaviour led the poverty headcount ratio to increase by 3.5% in India (Shahrawat and Rao 2012). Given the positive relationship between socio-economic status (SES) and health outcomes – referred to as the health–SES gradient – government intervention is necessary to ensure equitable outcomes in the health market. Introduction of health insurance schemes are a common form of such intervention. Empirical studies of healthcare-seeking behaviour in developed countries have shown that such health insurance schemes may reduce the influence of SES on health status (Fan et al. 2012). Similar studies exploring the health–SES gradient in the presence of health insurance are lacking for India. The present study is an attempt to remedy this deficiency. The objective is to examine whether health insurance can ensure equity in the health market of developing countries. The paper uses unit-level data from a national survey on healthcare expenditure undertaken by the National Sample Survey Organization.

Materials and Methods

Conceptual Framework

In the absence of health insurance, the SES of individuals determines the extent to which they can access healthcare facilities. Given the high OOP expenses of healthcare, the relation between SES and access to healthcare is positive (AA in Figure 1), so persons with poor SES have limited access to healthcare.

Figure 1. Health–SES gradient and insurance



SES = socio-economic status.

There is a further problem with this situation: the healthcare market is characterized by information asymmetries, as the patient cannot assess the worth and relevance of the physicians' advice (because of lack of medical knowledge), while the latter is assumed to possess all relevant information about the patient. Economic theory predicts that in the presence of information asymmetries, an agent (who has entered into a contract to undertake some action on behalf of the principal) has the incentive to act according to his own self-interest at the expense of the

principal's welfare. This is moral hazard. For instance, the demand for medical care is an induced preference (Feldstein 1977), where physicians' interest and peer pressure play an important role in shaping patients' usage of healthcare services. In the presence of information asymmetries, there is a possibility that, guided by physicians, patients will undertake more expensive diagnostic tests and treatment procedures than they require or can afford. This results in catastrophic expenditure¹ and impoverishment of the patient's household.

In such situations, incorporating insurance companies in an otherwise exclusive physician–patient relationship has two positive effects:

- By paying a small monthly premium, persons from even poor SES backgrounds may protect themselves against the heavy OOP expenditure incurred from disease episodes. The impact should be to raise the bottom portion of the health–SES gradient (BB in Figure 1). This improves health outcomes and ensures equity in the healthcare market (Balarajan et al. 2011).²
- Health insurance also reduces the problem of asymmetric information between the actions of physicians and patients (Blomqvist 1991; Kim and Wang 1998; Ma and McGuire 1997; Selden 1990), leading to more efficient health outcomes.

However, the presence of health insurance means that the patient too is participating in the “production” of health. Insurance may encourage insured patients to seek treatment even when such treatment is not essential; this tendency may be encouraged by physicians, so that a double moral hazard may emerge (Bhattacharya and Lafontaine 1995; Demski and Sappington 1991). Simultaneously, as demonstrated by Rothschild and Stiglitz (1976), the presence of asymmetric information in the insurance market may lead to an adverse selection problem. Adverse selection results from an asymmetry in market information in favour of the buyer of insurance – as insurance companies cannot determine whether the insured person is behaving in a risky manner. Two consequences of asymmetric information in the insurance market are:

- High-risk individuals are more likely to buy insurance; and,
- They are also likely to buy larger amounts of insurance than low-risk persons.

This hikes up the insurance premium, reducing the number of persons covered. Typically, the result is exclusion of economically vulnerable sections of the community from insurance coverage. Empirical studies on health insurance (Cutler and Zeckhauser 2000; di Novi 2008) have confirmed these theoretical results. Both moral hazard and adverse selection may operate together, resulting in an inefficient and inequitable equilibrium (Markova 2006; Wallace 2002).

To sum up, theory fails to provide an unambiguous answer to the effects of introducing insurance in reducing inequities in healthcare markets. The answer will depend upon the contextual situation. This motivates us to examine the nature of the health–SES gradient in India, a growing developing country with poor health indicators and low per capita public spending on health, and analyze the impact of insurance on this relationship.

Database and Methodology

The National Sample Survey Organization had undertaken an all-India survey on morbidity and healthcare between January and June 2004. The survey covered 959 million individuals from 199 million households. Only the urban sample is used in this study, as the coverage of rural households under insurance schemes is negligible. In urban areas, of 132,563 incidents of admission to hospital services, only 2.86% were covered under any form of insurance and 0.99% under private insurance.

The paper uses multivariate regression analysis to derive the relationship between SES and usage of hospitalization services, controlling for socio-demographic factors, living environment³ and accessibility to hospital services (per capita hospital beds). SES is captured by per capita monthly family expenditure and household head's education, while socio-demographic control

factors include age, gender of respondent, gender of household head, occupation of household head and household size.

In India, religious and social groups constitute an important category of analysis. Based on information on religion and caste of respondent, we created a variable denoting the socio-religious identity of respondent. The sample is divided into five groups: Hindu Upper Castes, Hindu Scheduled Castes and Scheduled Tribes, Hindu Other Backward Classes, Muslims and Others (comprising of non-Muslim religious minorities). Scheduled Castes (SCs) are Hindus belonging by birth to the lowest of the four castes. They were formerly untouchables and, even now, are often economically and socially depressed. Scheduled Tribes (STs), on the other hand, are members of economically and socially depressed tribes who were also treated as untouchables. In post-Independence India, Articles 341 and 342 of the Constitution provide a list of all SCs and STs under the Constitution (Scheduled Castes) Order, 1950, and the Constitution (Scheduled Tribes) Order, 1950, respectively, to facilitate affirmative action targeting such social groups. Other Backward Classes (OBCs) is a collective term used by the Government of India for castes that are educationally and socially disadvantaged. The complete list of variables is provided in the Appendix.

The study variable is whether the respondent has been hospitalized in the 365 days preceding the survey or not (HOSP). As this is a binary variable, a probit model is used. The basic model is extended by introducing compliances. Compliances refer to health-related efforts of the patient, such as defensive expenditure, seeking insurance coverage, and so forth. This paper considers health insurance (INS). Now, health insurance policies may lead to either moral hazard (the incentive of the insured to seek more healthcare than is required) or adverse selection (the tendency of the sick to choose more generous insurance than the healthy)⁴ or both. This has important consequences for the econometric model.

In the presence of moral hazard, an existing policyholder is more likely to seek healthcare, including in-patient services, on the physician's advice because the patient does not have to bear the expenses incurred as a result of following the physician's advice. This implies:

$$\text{HOSP} = f_1(\text{INS}, V). \quad [1]$$

when V is the vector consisting of SES and control variables. On the other hand, if adverse selection exists, persons expecting to be hospitalized in the future are more likely to purchase health insurance, that is:

$$\text{INS} = f_2(\text{HOSP}, V). \quad [2]$$

In other words, we have a two-way causal relation between insurance and hospitalization. In such cases the instrumental variable method must be used. This method is based on use of an instrumental variable (z) which determines insurance but not hospitalization. This instrument is added to [2], replacing HOSP:

$$\text{INS} = f_2(z, V) \quad [2a]$$

After estimating [2a] we find out predicted probabilities of purchasing insurance (PINS) and plug it in [1]:

$$\text{HOSP} = f_1(\text{PINS}, V) \quad [1a]$$

In this paper, we have used magnitude of loss in household income due to the disease episode as the instrument. The choice of the instrument may be justified by referring to the Permanent Income Hypothesis (Friedman 1957). This hypothesis argues that consumers try to adopt strategies to protect their current consumption from falling due to income shocks (a sudden and temporary decline in income). One such strategy is to insure against income loss from temporary shocks like disease episodes (Folland et al. 2006). The decision to buy health insurance depends on the probability of suffering income loss due to a disease episode but is not exclusively related to the probability of requiring hospitalization⁵.

As noted previously, the introduction of insurance into decision making creates another infor-

mation-related market failure – adverse selection – that now affects outcome in the market for healthcare. Therefore, the decision to purchase insurance:

$$\text{INS} = g1 (\text{HOSP}, \text{CV}) \quad [3]$$

should also incorporate the fact that:

$$\text{HOSP} = g2 (\text{INS}, \text{CV}) \quad [4]$$

We again make recourse to the two-stage model. In the first stage we estimate:

$$\text{HOSP} = g2 (\text{Instrument}, \text{V}). \quad [4a]$$

The instrument here is accessibility of hospital services measured by per capita beds, which determines usage of in-patient services but does not affect insurance coverage and whether the respondent had been ill in the 15 days preceding the survey. The estimated probability of being hospitalized (PHOSP) is substituted into the insurance model [3]:

$$\text{INS} = g1 (\text{PHOSP}, \text{V}) \quad [3a]$$

Findings

Detecting Moral Hazard and Adverse Selection

We have estimated two models regressing whether the respondent was hospitalized, with SES as the explanatory variable – a single equation model without insurance, and a second (two-stage) model including insurance. The results (Table 1) are very similar for both the models.

As expected, the demand for healthcare, like any other commodity demand, depends positively on the patient's ability to pay (proxied by log of monthly household expenditure levels, LPCE). In both models, the coefficient of LPCE is positive and significant at the 1% level. The other proxy for SES is education. Interestingly, we find an inverse U-shape between education of household head and usage of hospital services. We may explain this as follows: Less-educated household heads are less aware of the need for hospitalization (Grossman and Kaestner 1997), and their economic capability to bear hospitalization expenses is also low⁶. At the other end, educated household heads (with more than a secondary level of education) are more aware but require in-patient services less than others as they live in better conditions⁷ and are less exposed to health hazards.

Table 1. Regression results of hospitalization on SES – with and without health insurance

Variables	Without health insurance			With health insurance		
	Odds ratio	z	Probability	Odds ratio	z	Probability
PINS				3.79	2.42	0.02
Log of monthly household expenditure	1.14	5.10	0.00	1.10	3.39	0.00
Education of household head (Ref: Below primary education, including informal education)						
Illiterate	0.80	-6.10	0.00	0.80	-6.22	0.00
Primary	0.94	-1.86	0.06	0.94	-1.92	0.06
Secondary	0.94	-1.78	0.08	0.94	-1.93	0.05
Higher secondary	0.85	-4.17	0.00	0.83	-4.66	0.00

Table 1. Continued

Variables	Without health insurance			With health insurance		
	Odds ratio	z	Probability	Odds ratio	z	Probability
Occupation of household head (Ref: Service)						
Professional	0.87	-2.75	0.01	0.86	-2.86	0.00
Administrative	0.88	-2.61	0.01	0.86	-2.98	0.00
Clerk	0.90	-2.15	0.03	0.90	-2.13	0.03
Sales	0.86	-3.41	0.00	0.85	-3.56	0.00
Primary	0.92	-1.64	0.10	0.92	-1.66	0.10
Manufacturing	0.95	-1.16	0.25	0.95	-1.29	0.20
Others	0.79	-4.31	0.00	0.78	-4.38	0.00
Socio-religious identity (Ref: Hindu Scheduled Castes & Scheduled Tribes)						
Hindu upper caste	0.89	-3.50	0.00	0.88	-3.60	0.00
Other backward castes	0.94	-1.87	0.06	0.94	-1.90	0.06
Muslim	0.97	-0.74	0.46	0.98	-0.65	0.52
Others	0.91	-2.11	0.04	0.91	-2.24	0.03
Living environment	1.00	-0.33	0.75	1.00	-0.09	0.93
Age	1.02	44.37	0.00	1.02	43.81	0.00
Gender of respondent (Ref: Male)						
Female	0.95	-2.69	0.01	0.95	-2.52	0.01
Household size	0.91	-18.60	0.00	0.91	-16.44	0.00
Gender of household head (Ref: Male)						
Female headed household	1.04	0.97	0.33	1.04	0.98	0.33
Per capita beds in state	1.00	4.30	0.00	1.00	4.29	0.00
Observations	132417			132417		
LR χ^2	2772.59		0.00	2778.14		0.00
Pseudo R ²	0.04			0.04		

PINS = predicted probability of purchasing insurance; SES = socio-economic status.

Thus, contrary to the literature (Guralnik et al. 1993; Mincer 1974; Pappas et al. 1993; Somers 1986), we find that the positive relationship between healthcare usage and SES persists – the coefficient of LPCE falls marginally from 1.14 to 1.10 – even if we introduce insurance into our model. One reason may be the low insurance coverage in India (Government of India 2005). Moreover, SES may remain an issue due to the complete or partial withdrawal of “cashless insurance cover⁸,” because of problems like co-insurance, co-payment, and so forth⁹.

The coefficient of PINS (predicted probability of purchasing insurance) in the model with insurance is positive and significant. This implies that insured respondents are more likely to seek hospitalization services – indicating the presence of a moral hazard. However, we cannot identify whether the moral hazard is on the patient’s part (he/she seeks treatment on his/her own) or the physician’s (the physician recommends unnecessary treatment).

In the next two-stage model ([3] and [4]), we test for the presence of adverse selection. Results reveal that the coefficient of PHOSP is significant at the 1% level and is positive (Table 2). This implies that respondents who expect to be hospitalized are more likely to purchase health insurance, indicating the presence of adverse selection.

Table 2. Results of regression model of insurance: detecting adverse selection

Variables	Odds Ratio	z	Probability
PHOSP	6.90	4.72	0.00
Log of monthly household expenditure	4.83	25.69	0.00
Education of household head (Ref: Below primary education, including informal education)			
Illiterate	0.57	-2.83	0.01
Primary	0.97	-0.21	0.83
Secondary	1.62	4.33	0.00
Higher secondary	2.32	7.45	0.00
Occupation of household head (Ref: Service)			
Professional	3.23	4.97	0.00
Administrative	4.49	6.44	0.00
Clerk	2.55	3.90	0.00
Sales	3.59	5.44	0.00
Primary	1.51	1.34	0.18
Manufacturing	2.59	3.98	0.00
Others	2.64	3.80	0.00
Age	1.04	7.38	0.00
Square of age	0.99	-6.65	0.00
Gender of respondent (Ref: Male)			
Female	0.79	-4.07	0.00
Socio-religious identity (Ref: Hindu Scheduled Castes & Scheduled Tribes)			
Hindu upper caste	1.79	4.04	0.00
Other backward castes	1.63	3.19	0.00
Muslim	0.54	-2.87	0.00
Others	2.27	5.27	0.00
Household size	0.78	-15.51	0.00
Gender of household head (Ref: Male)			
Female head	0.92	-0.69	0.49
Loss of household income	1.00	1.29	0.20
Observations	132417		
LR χ^2	2719.71		0.00
Pseudo R ²	0.18		

PHOSP = predicted probability of being hospitalized.

We again find SES a significant predictor of the decision to purchase insurance. Respondents coming from families with high expenditure levels or with better-educated heads are more likely to purchase insurance.

Variations over SES

Finally, we compare the magnitude of coefficients of PHOSP and PINS across expenditure classes and education levels.

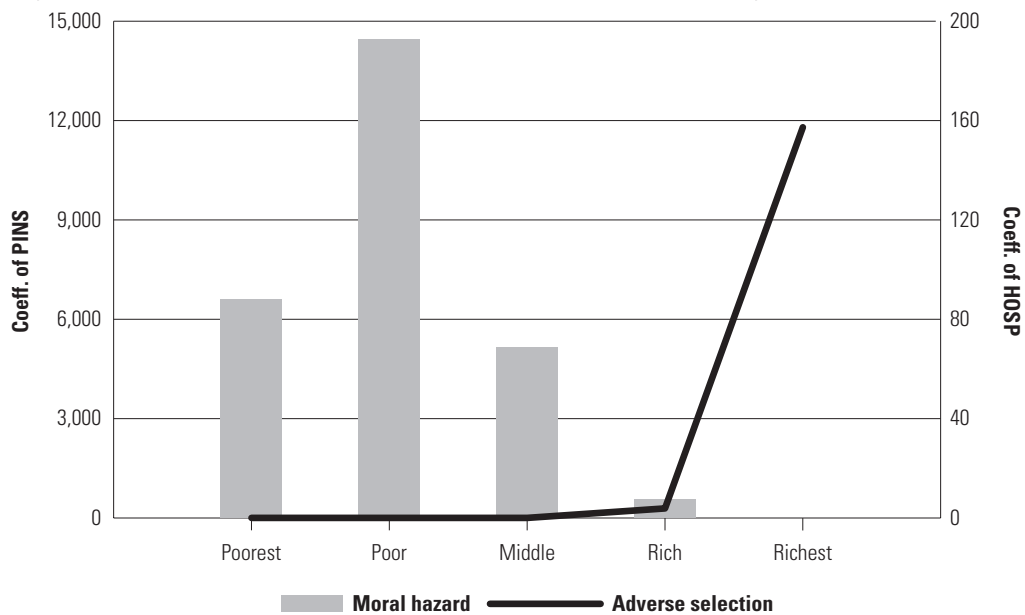
We first group the sample into five quintile groups using family expenditure levels (so that each group contains one fifth of the sample). We label these expenditure groups as poorest (bottom 20%), poor (next 20%), middle (middle 20%), rich (next 20%) and richest (top 20%).

In Figure 2 we plot the coefficients of PHOSP and PINS (obtained from [6] and [7]) for each of these expenditure groups.

$$\begin{aligned} \text{HOSP} &= a + b \text{ PINS} + c_1 \text{SD}_1 + c_2 \text{SD}_2 + c_4 \text{SD}_4 + c_5 \text{SD}_5 + d \text{ control variables} \\ \text{when SD}_i &= \text{PINS if respondent is from } i\text{th monthly family expenditure quintile} \\ &= 0 \text{ otherwise} \quad [6] \end{aligned}$$

$$\begin{aligned} \text{INS} &= \alpha + \beta \text{ PINS} + \gamma_1 \text{SD}_1 + \gamma_2 \text{SD}_2 + \gamma_4 \text{SD}_4 + \gamma_5 \text{SD}_5 + \delta \text{ control variables} \\ \text{when SD}_i &= \text{PHOSP if respondent is from } i\text{th monthly family expenditure quintile} \\ &= 0 \text{ otherwise} \quad [7] \end{aligned}$$

Figure 2. Variation of coefficients of PHOSP and PINS across expenditure groups



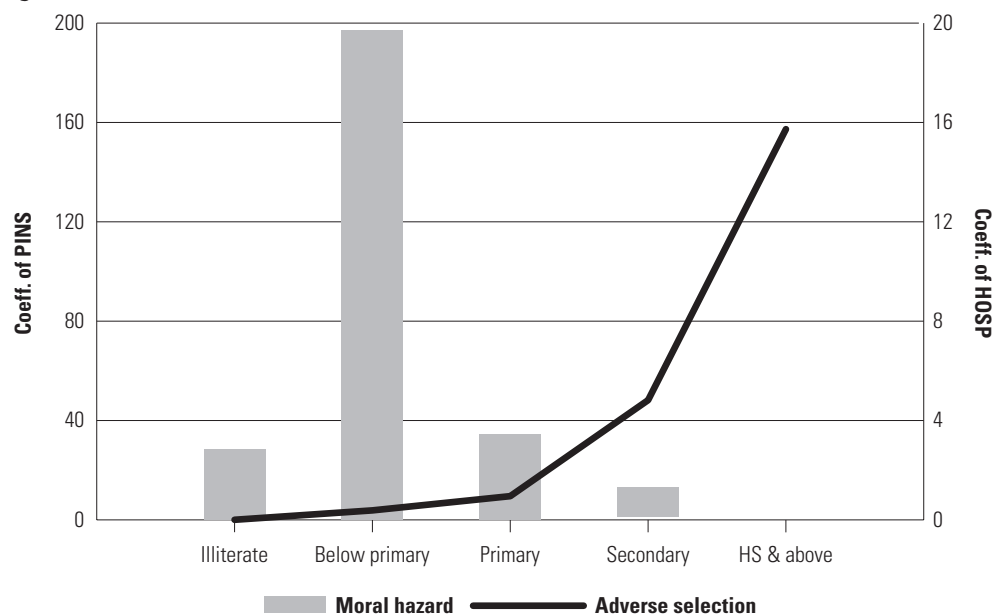
HOSP = hospitalized in year preceding survey; PHOSP = probability of being hospitalized; PINS = predicted probability of purchasing insurance.

The intercept gives the value of PINS (or PHOSP) for the third quintile group; the coefficients of PINS and PHOSP for the remaining quintile groups are given by $(c_i - a)$ and $(\gamma_i - \alpha)$, respectively.

We can see that the tendency of insured people to seek in-patient care (moral hazard) is lower for respondents belonging to higher expenditure classes (Figure 2). This is in line with earlier studies of health insurance in developing countries (Jowett et al. 2004). With respect to the tendency to purchase insurance, however, we find that it is the fourth – and particularly the fifth – quintile that displays adverse selection. This has interesting implications, as this economic class is not only the least economically vulnerable but also has the purchasing capacity to drive up the insurance price beyond the ability of the poorer expenditure groups.

One important problem in interpreting the coefficient of PINS as indicative of the presence of moral hazard is that it may simply reflect variations in awareness of the importance of health as a capital good. This may be checked by examining the variation of coefficient of insurance over education levels.

Figure 3. Variation of coefficients of PHOSP and PINS across education levels



HOSP = hospitalized in year preceding survey; HS = higher secondary; PHOSP = probability of being hospitalized; PINS = predicted probability of purchasing insurance.

Similar to [6] and [7], we construct equations for HOSP and INS and incorporate slope dummies for education levels in these two equations. Figure 3 depicts variations in the coefficients of PINS and PHOSP across educational groups.

We find that the tendency to seek in-patient care decreases at higher levels of education. This rules out the possibility that greater health-seeking by the rich reflects their awareness of the importance of protecting their health status. Rather, our initial conjecture that moral hazard is present in the Indian health market is supported. On the other hand, even though the likelihood of seeking insurance coverage increases with education levels, this does not negate the possible presence of adverse selection.

Conclusion

The paper analyses the nature of usage of in-patient services among Indian households. Our starting point was that SES determines usage of hospital care, creating inequities in the health-care market. Studies of health insurance markets generally show that the introduction of health insurance into the healthcare market reduces the inequities in usage of healthcare. In contrast, we find that SES remains an important determinant of hospitalization usage even in the presence of insurance. This implies that the health insurance market in India is not eliminating the inequities in seeking healthcare services by providing coverage to those most in need of it. The health-SES gradient does become less steep in urban areas, but the decrease is not marked – the odds ratio of LPCE falls from 1.14 in the absence of insurance to only 1.10 after introducing insurance. There may be two reasons for the failure of health insurance to reduce inequities in utilization of hospitalization services. One is the failure of the state to provide health coverage to the poorer households. Secondly, linking tax rebates to investment in health insurance policies encourages relatively affluent households to purchase health insurance, pervasively increasing existing inequities in the healthcare market. The impact of these two forces is to make insurance coverage highly regressive¹⁰.

Another problem is the presence of market failures, leading to further distortions in market equilibrium. Firstly, results show that persons who believe they may be hospitalized in the future are more likely to purchase insurance. Secondly, the presence of insurance coverage significantly affects the decision to be hospitalized, leading to more claims. Both these effects create an upward pressure on the price of insurance, thereby pushing it further beyond the reach of the poorer sections of the community. This poses major challenges to public health policy in India, particularly in the context of the recommendations of the High Level Expert Group (HLEG) on Universal Health Coverage for India (Government of India 2011). The HLEG calls on the state to provide “affordable, accountable, appropriate health services of assured quality ... with the government being the guarantor and enabler, although not necessarily the only provider ...” (Government of India 2011: 9).

Our findings indicate that attempts to ensure universal health coverage and introduce community health insurance schemes may create moral hazard and lead to a massive upsurge in demand for healthcare facilities. Therefore, implementing this recommendation will require a complete overhaul of the health sector, incorporating aspects like remodelling healthcare institutions, establishing infrastructure to create human resources in health, delineating protocols for treatment, providing medicines and finding resources to fund this massive exercise. The last point is particularly important as the HLEG estimates that public spending on health will have to jump from the current 1.2% of GDP to 3% in 2022. Whether the Indian government will be able to rise to this challenge remains to be seen.

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Notes

1. Catastrophic health expenditure occurs when households have to reduce their expenditure on food and other items over a period to cover the OOP expenses of diagnosis and treatment. The catastrophic threshold is generally taken as cost of a disease episode in excess of 40% of total income (expenditure) or 20% of expenditure on food items.
2. Richardson et al. (2012), however, point out that the barriers to accessing health services remained even after the introduction of mandatory social health insurance coverage in Moldova.
3. The variable “living environment” is the score from principal component analysis undertaken on variables indicating structure of house, quality of drinking water (based on combination of source of drinking water and nature of its treatment), type of drainage and sanitation, and source of energy. The Kaiser-Meyer-Olkin (KMO) test for data adequacy (0.7644) indicates that factor analysis is permissible; the eigenvalue is 2.29, capturing 45.76% of the variation. Normalized scores (ranging from 0 to 100) are used in the econometric analysis. High scores indicate healthier living conditions.
4. In addition, we can also have the problem of supply-induced demand (the incentive of the physicians to refer insured patients for hospital admission).
5. Correlation between loss in income due to hospitalization and hospitalization is 0.0125. This is very low, so that use of loss in income due to hospitalization may be taken as an instrument.

6. Mean annual expenditure of illiterate-headed households – Rs. 47,708 (approximately xxx US dollars), 23% below the mean annual expenditure of the sample – is lower than that of other households.
7. Factor scores of living environment for households headed by an individual with secondary and higher education are 73 and 81 respectively, compared to the sample average of 62.
8. Cashless insurance cover refers to a system whereby the patient is provided with treatment against a nominal fee, or even without any payment, by the health care provider. The actual expenses incurred are recovered from the third party, in this case the health insurance company covering the patient. In India hospitals have tended to inflate expenses while claiming reimbursement from health insurance companies. This led to restrictions on cashless insurance cover. Some companies withdrew this system, while others require the patient to pay a higher fee (that is reimbursed).
9. In 2010, for instance, major health insurance companies in India announced the withdrawal of cashless hospitalization facilities to policy holders as private sector hospitals were overcharging patients.
10. This is indicated by the value of Kakwani's concentration index (0.51). Kakwani's Index (Kakwani et al. 1997) ranges from –1 to +1, with high positive values denoting regressive coverage and low negative values denoting progressive coverage.

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Appendix: List of variables

Variables	Meaning
HOSP	Whether respondent has been hospitalized in year preceding survey
INS	Whether respondent has holds any private insurance
PHOSP	Predicted probability of being hospitalized in year preceding survey
PINS	Predicted probability of purchasing insurance
Log of Monthly Household Expenditure	Log of expenditure per month by family
Education of household Head	
Illiterate	Household head is illiterate
Below primary (Ref. Cat.)	Household head has below primary education, including informal education
Primary	Household head has primary level of education
Secondary	Household head has secondary level of education
Higher secondary	Household head has higher secondary or above level of education
Occupation of household head	
Professional	Household head is a professional
Administrative	Household head is an administrator
Service (Ref. Cat.)	Household head is in service
Clerk	Household head is a clerk
Sales	Household head is a salesperson
Primary	Household head is engaged in primary sector
Manufacturing	Household head is engaged in manufacturing sector
Others	Residuary category of occupation of household head
Socio-religious identity	
Hindu upper caste	Respondent belongs to Hindu Upper Caste
Hindu SCs & STs (Ref. Cat.)	Respondent belongs to Hindu Scheduled Castes & Scheduled Tribes
Other backward castes	Respondent belongs to Hindu Other Backward Castes
Muslim	Respondent belongs to Muslim community
Others	Respondent belongs to non-Muslim religious minority community
Living environment	Factor score of structure of house, quality of drinking water (based on combination of source of drinking water and nature of its treatment), type of drainage and sanitation, and source of energy
Age	Age of respondent
Square of age	Square of age of respondent
Gender of respondent	
Male (Ref. Cat.)	Respondent is male
Female	Respondent is a female
Gender of household head	
Male headed household (Ref. Cat.)	Respondent belongs to household headed by male
Female headed household	Respondent belongs to household headed by female
Household size	Number of members in household
Loss of household Income	Income lost by respondent and family members due to disease episode
In-patient treatment	Whether respondent had sought treatment as an out patient in 15 days preceding survey
Per capita beds in state	Number of beds divided by population of state