Working Paper 330

Out-Of-Pocket (OOP) Financial Risk Protection: The Role of Health Insurance

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OUT-OF-POCKET (OOP) FINANCIAL RISK PROTECTION: THE ROLE OF HEALTH INSURANCE

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Abstract

Though health has been considered a fundamental human right since the Alma Ata Declaration in 1978, still a significant proportion of world population don't get access to basic healthcare simply due to their inability to pay. With the increasing incidence of life style diseases, advent of new healthcare technology and privatisation of healthcare, cost of healthcare has increased manifolds and become unaffordable to many. More people end up spending catastrophic sums and often adopt inefficient mechanisms like borrowing, selling of valuable assets and even curtailing children's education to finance health spending in LDCs like India. Hence, government has to play a major role in health financing. Keeping fiscal constraints in mind, governments in recent years have been promoting health insurance as a viable solution for promoting efficiency and equity in the health care sector. However, a little is known if health insurance indeed reduces healthcare burden (catastrophic expenditure) and impoverishment. Hence, this paper seeks to estimate the effect of insurance on out-of-pocket health expenditures, using Indian Human Development Survey (IHDS, 2004-05) and appropriate econometric techniques like, two-part and logit model. Our findings suggest that health insurance reduces the degree of OOP health expenditure, probability of catastrophic expenditure and impoverishment. Hence, the recent introduction of health insurance programme by various state and central governments is a welcome move. We argue that health insurance should be universalised rather than targeted to the BPL families alone since catastrophic expenditure is faced not only by poor HHs but also by higher percentage of HHs from rich income quintiles. The logic behind targeting of BPL families and their selection is evidently flawed as it excludes the genuinely needy beneficiaries from the ambit of insurance cover. Interestingly the study found that the probability of incurring catastrophic expenditure and impoverishment increases almost equally on account of both outpatient and inpatient expenditure. However, most of the health insurance schemes in India either government or privately provided are of inpatient oriented, leaving a large part of OOP expenditure not covered under the scheme. Hence, there is need of rethinking on the design of health insurance to make both government and private provided insurance scheme more attractive and effective.

Keywords: *Health insurance, OOP, Catastrophic Expenditure, Impoverishment, Health Financing, Logit*

Introduction

Though health has been considered a fundamental human right since the Alma Ata Declaration (1978), a significant proportion of world population don't get access basic healthcare due to various socio-economic reasons, where deprivation of care because of a patient's inability to pay is one of the major cause. With the increasing incidence of life style diseases, advent of new healthcare technology and privatisation, cost of healthcare has been ever increasing and becoming unaffordable to many. More often people end up making catastrophic expenditure and face impoverishment. To finance their healthcare expenditure, they often adopt inefficient mechanism like borrowing, selling of valuable assets and even curtailing children's education.

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One of the major goals of an efficient and desirable healthcare system is to prevent the deprivation of care because of a patient's inability to pay (Feldstein, 2006). However, in India, for example, around 27% of all sick persons who do not take any medical advice cite lack of means as one of the major reasons, even though facilities are available nearby, which fact poses a serious challenge to the policy maker (NSSO Report, 2006). On the other hand, despite the higher cost, a majority of both rural and urban Indians prefer private care. The primary reason for this preference is the perceived inferior quality of public health care, which is very much underfunded and therefore ineffective. Moreover, following the macroeconomic adjustments in 1990s some major policy shifts in the health sector has been prompted, and one such significant policy shift in public health sector was the levying of user fees, introduced during the eighth five-year plan (1992–97). Also, during the late 1990s to early 2000s, many states initiated World Bank–sponsored health system reforms that further increased user fees in government hospitals. Although user fees were waived for people living below the poverty line, the definition of poor was arbitrary, leading to limited relief for most poor people (Thakur and Ghosh, 2009). Consequently, people are spending a higher proportion of their healthcare cost out-of-pocket. The proportion of OOP is approximately 86 percent of total private health expenditures and close to 58 percent of total health expenditures in India for the year 2012.[3] Higher OOP expenditure puts tremendous strain on households (HH) which often lack the means for day-to-day living, and their inability to pay naturally results in not getting adequate health care. The problem of higher preference for private sector health care and the higher share of OOP expenditure are undoubtedly direct outcomes of the increasing privatisation of health system and under funding of public sector health care in India.

India's current government expenditure on health is abysmal at around 1.3% of GDP compared to OECD countries' government spend of 5 to 8% of each country's GDP. Government expenditure was expected to go up by 2.5 to 3% as per the promise of the UPA-2 government, so as to reach the level prescribed by HLEG (2011) in order to achieve the goal of Universal Healthcare (UHC). It advocated through evidence that in order to move closer towards universal access to healthcare governments need to spend over 15% of their budget or at least 4% to 5% of their gross domestic product (GDP) on healthcare (PHA 3, 2012). Given the current trend in health care spending by government, it seems impossible for the country to achieve the goal of UHC until it fulfilled some of the recommendations of HLEG in regard to healthcare spending.

Nonetheless, with the fiscal constraint in mind governments both at state and centre have introduced various health insurance schemes as first step towards achieving UHC. For example, Rastriya Swathya Bima Yojna (RSBY) is a central government initiative, while KALAIGNAR (in Tamil Nadu), YESHASWINI Trust and Vajapayee Arogyasri Scheme (in Karnataka) and Rajiv Aarogyasri (in Andhra Pradesh) are the schemes of respective state governments. Then the most important question is: Is insurance the best way to tackle the issue of catastrophic expenditure and impoverishment due to health expenditure? This is an empirical question that needs to be carefully investigated. Therefore, the objective of this paper is to examine if health insurance reduces healthcare burden (catastrophic

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[3] This data extract has been generated by the Global Health Observatory of the World Health Organization. The data was extracted on 2014-07-07 14:20:23.0.

expenditure) and impoverishment. Through this we also try to look into some of the burning issues such as:

a) How does the health care expenditure differ across various socio-economic groups, and who are the most vulnerable to catastrophic healthcare payment?

b) Does OOP expenditure lead to impoverishment? How much intensive is the economic impact of catastrophic payment on different socio-economic groups?

c) What are the major determining factors for catastrophic payment in health care?

d) Lastly, does insurance protect HH from catastrophic expenditure and impoverishment?

There are some studies in India that have looked into the impact of health insurance on HHs' catastrophic expenditure and its impoverishment effect in aggregate. This study will seek evidence whether health insurance can be a mechanism to achieve universal health coverage and hedge people from financial risks. Moreover, it can help to understand the effects of past and present decisions and therefore would provide useful inputs for future health care policy design, especially whether insurance can be an instrument to tackle the problem of rising healthcare cost.

The paper is arranged into various sections. In section-2 we will highlight the Indian healthcare Financing System, where the role of public, private and social health insurance will be discussed in brief. Section-3 reviews the available literature where the conceptual and theoretical framework along with empirical literatures will be briefly discussed. The data source and methodology of the study will be discussed in section-4. In section-5 we discuss results and in section-6 we conclude with some policy implications based on the present study.

Healthcare Financing System in India: An Overview

In this section, we discuss the sources of funds used to pay for health care services in India. Indian health care is financed through a combination of sources including: (i) the *tax-based public sector* that comprises local, State and Central Governments, in addition to numerous autonomous public sector bodies; (ii) the *private sector* including the not-for-profit sector, organizing and financing, directly or through *insurance*, the health care of their employees and target populations; (iii) *households* through *out-of-pocket (OOP)* expenditures, including user fees paid for public facilities; (iv) other *insurance-social and community-based*; and (v) *external financing* (through grants and loans).

Amongst all the above sources of financing, insurance and tax based financing are considered the most equitable systems of financing, while out-of-pocket expenditures by HHs the most inequitable. In tax based system, resources are mobilized from the richer sections to finance the health needs of the poor whereas, in health insurance system health risk and its associated cost is cross subsidised among rich and poor, healthy and unhealthy, young and old. But under out-of-pocket system, the poor, who have the greater probability of falling ill due to poor nutrition, unhealthy living conditions, etc. pay disproportionately more on health than the rich, and access to healthcare is dependent solely on ability to pay.

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Table 1: Household (HH), Private and Government Health Expenditure in INDIA during 2002-2012

Year	Govt expd on health as % of THE	Govt expd on health as % of TGHE	THE as a % of GDP	Govt expd on health as % of GDP	OOP expd by HH as % of Pvt expd on health	Pvt expd on health as % of THE	OOP expd by HH as % of THE
2002	23.18	6.25	4.40	1.02	91.92	76.82	70.61294
2003	22.79	5.89	4.29	0.98	91.61	77.21	70.73208
2004	20.93	6.13	4.50	0.94	90.51	79.07	71.56626
2005	22.07	6.85	4.25	0.94	90.27	77.93	70.34741
2006	23.47	6.96	4.03	0.95	89.07	76.53	68.16527
2007	24.69	6.71	3.88	0.96	87.75	75.31	66.08453
2008	26.32	6.59	3.93	1.03	87.07	73.68	64.15318
2009	27.58	6.86	3.93	1.08	86.64	72.42	62.74469
2010	28.15	6.76	3.69	1.04	86.00	71.85	61.791
2011	30.54	8.24	3.92	1.20	86.25	69.46	59.90925
2012	33.09	9.38	4.05	1.34	86.04	66.91	57.56936

Source: data extracted from World Health Organization website (http://apps.who.int/gho/athena/data/download.xsl?format=xml&target.......)

In India, OOP expenditure dominates amongst the sources of health financing. Table-1 shows that the proportion of OOP in India was approximately 92 percent of total private health expenditures[4] and close to 77 percent of total health expenditures in 2002 which has come down to 86.04 percent and 58 percent respectively in 2012, which is assumed to be due to the effect of National rural health Mission (NRHM) and state financed health insurance schemes like Rashtriya Swasthya Bima Yojna (RSBY) launched since 2004-05 and 2007-08 respectively. However, this is much higher compared to many developing and most developed countries. In many developed countries the share of OOP around 25 to 50 per cent. For example, in the OECD countries the average OOP share has been approximately 15 to 20 percent. In the year 2012, out of the total 4.05 percent of GDP spent on health care, government's share was around 1.3 percent of GDP which constitute roughly 33 percent of total health care expenditure, which is quite abysmal. However, there was an increase in government expenditure on health as a percentage of total health expenditure by 10 percentage points during the decade 2002 - 2012. The government expenditure on health and family welfare had been declining over the years and until the introduction of various central government sponsored mega health schemes NRHM in 2004-05 and health insurance schemes (RSBY in 2007-08). The sub sequent years witnessed a slight increase in government expenditure, i.e. from 0.9% in 2000 to 1.3% of GDP in 2012.

According to Gupta *et al* (2001), low-income countries would require public spending of around 12 % of GNP to achieve universal health coverage and meet the international development goals. In the Indian context, such spending seems to be far from being realized as we were experiencing a decline in public health spending from 1990-91 to 2003-04 followed by a very small increase thereafter (see fig-1

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[4] The other sources of private health financing are non-household private sector including companies, NGOs, community financing and so on.

and fig-2). The health expenditure as percentage of GDP declined from 1.32 percent in 1990-1991 to 1.16 percent in 2004-05. This decline is mainly due to a decline in the states' expenditure which fell from 1.2 percent of GDP in 1990-1991 to 0.97 percent in 2004-05 while centre's share remained more or less constant (between 0.27 percent and 0.31 percent of GDP) during the same period. Declining government health expenditure can also be seen from the decline in the share of health expenditure of centre and states in the total government (centre and state) expenditure during 1990-91 to 2004-05. The decline in the share of states' health expenditure in their total expenditure has been more prominent (from almost 7.5 percent in 1999-2000 to almost 5.7 percent in 2004-05). On the contrary, the share of centre's health expenditure in its total expenditure has been increasing. Since states account for three quarters of all government health expenditure, any rise or fall in states' health spending influences total spending. States' spending accounted for nearly 78 percent of total health spending in the mid-1990s, but this declined over the years to reach 71 percent in 2004-05 (Berman and Ahuja, 2008). However, there has been perceptible increase in government health expenditure since 2005 with the advent of various central government health schemes initiatives. Various flagship programmes like NRHM (in 2005) and RSBY (in 2007) have increased the central government health expenditure. In addition to that, various state governments also initiated various health insurance schemes for the low income people, leading to increase in government expenditure on health.

Fig-1 :Share of Government Health Expenditure in Total Government Expenditure (%)

Source: RBI website and CSO, MoSPI, GoI

Fig-2: Share of Government Health Expenditure (as % of GDP)

Source: RBI website and CSO, MoSPI, GoI

Health Insurance Schemes

Private | Govt. | Community Based/ Micro Health Insurance

Risk Rated & Offered by Commercial | Non-Risk rated and govt. initiated | Community Rated and managed by

Market and Employer Based | Govt. / State based Schemes | NGO/ Cooperative based CHI

Fig-3: Broad Health Insurance Institutions in

The other important source of financing is the insurance system. It could be either social, community based insurance which are mainly non profit oriented, or private insurance for profit. There are various health insurance schemes available in India. Based on ownership, the existing health insurance schemes can be broadly divided into four categories:

1) *Government or state-based systems,*

2) *Market-based systems (private and voluntary),*

3) *Employer provided insurance schemes and*

4) *Member organization (NGO or cooperative)-based systems.*

Nevertheless, the above four mentioned categories of health insurance schemes can be bracketed into three broad institutions, i.e. Social, Private and Community based/Micro-Health Insurance institutions, as shown in shown in Fig-3. Similarly, the distinction between private and social insurance is not as clear-cut as indicated in our typology; i.e., most health insurance systems are somewhere in-between the extreme ends of either category (Jost, 2001). Private health insurance constitutes both market and employer based schemes and is offered by commercial organisations. The premiums are rated on the basis of individual risk. The social insurance schemes are mainly government and state run schemes and premiums are non-risk rated. In case of community based/micro health insurance schemes, premiums are community rated and managed by community or group members. Social and private health insurance schemes cover only the formal sector workers, whereas community based health insurance provide insurance to the low income and informal sector workers.

Social Health Insurance: The Role of Government

Social health insurance schemes are run by government and are mandatory as well as voluntary in nature. These schemes cover certain population groups, whether or not they contribute to the scheme.

Employees State Insurance Scheme (ESIS) as well as Central Government Health Scheme (CGHS) were the only mandatory and contributory social health insurance in existence until the introduction of voluntary health insurance in 1986, and covered only formal sector employees. Employees' State Insurance Scheme (ESIS) came into existence in 1952 while the Central Government Health Scheme (CGHS) was established in 1954. The ESI scheme covers all employers with more than 10 employees in 'notified areas'. The employees of covered employers who earn below Rs. 15,000 per month and their dependants are covered by the insurance scheme. As of 2009, there were 866,687 CGHS cardholders and around 3 million beneficiaries. Currently, there are more than 55 million beneficiaries under ESIS.

However, India does not have the financial means and institutional capacity to offer state-based social health insurance to its entire population. The other reasons are: (i) It is usually very difficult and expensive to add informal sector workers to the covered population. They tend to live in remote areas and not fully understand the benefits they can get from being part of the system. It is also very difficult to assess their income. (ii) Tax administration is weak which makes it difficult to collect taxes from rural and informal sector employees. (iii) The size of unorganised sector workers (around 94%) is so vast that it is very difficult to administer. Given the above limitation of public healthcare system, private and community based health insurance are the logical alternatives to insure against the cost of illness.

Nonetheless, to overcome the problem of exclusion of poor and informal sector workers from the health insurance systems, in recent year various central and state governments have initiated various social health insurance schemes. For example, Rastriya Swathya Bima Yojna (RSBY) is a central government initiative implemented throughout India by state government on 75:25 cost sharing basis and Chief Minister's Comprehensive Health Insurance Scheme, YESHASWINI Trust, Vajapayee Arogyasri Scheme and Rajiv Aarogyasri are some of the major schemes run by various state governments. In addition, the central government finances various life insurance and health insurance schemes which are implemented by the state governments and targeted at certain communities involved in informal occupations. Mahatma Gandhi Bunkar Bima Yojana (MGBBY), Janashree Bima Yojana (JBY), Rajiv Gandhi Swasthya Bima Yojana (RGSSBY) and Rastriya Swasthya Bima Yojana (RSBY) are some such recent schemes implemented by various state governments. The first two schemes include some form of health benefits but are more of life insurance schemes. Also, these schemes are for the benefit of certain specific communities (weaver, handicraft artisan & fishing) engaged in hazardous jobs. The last two schemes focus on health benefits are for artisans and BPL families, and became operational from 2007-08 and 2009-10 respectively.

Private Health Insurance: The Role of Private Sector

As far as private health insurance is concerned, insurance companies offer their schemes in the open market. In India, both public and private sector companies provide PHI (voluntary). The General Insurance Corporation (GIC), which comprises of four insurance companies namely; National Insurance Company Ltd. (NIC), New India Assurance Corporation Ltd. (NIAC), Oriental Insurance Company Ltd. (OIC) and United India Insurance Company Ltd. (UIIC), is the largest public sector organization providing the PHI in India. The various policies introduced by the GICs include Mediclaim Policy (group

and individual), Jan Arogya Bima, Personal Accident Policy, Nagarik Suraksha Policy and Overseas Mediclaim Policies (employment and study corporate frequent travel/business and holiday). Among these policies, the Mediclaim policy is relatively popular. There are, at present, 12 general insurance companies and 25 TPAs. The total number of insurance holders is reported to be 112 lakh with almost 90% enrolled with the four public sector insurance companies.

Since the liberalization of the insurance industry in 2000, India has been encouraging private players to enter the health insurance sector. With the enactment of the Insurance Regulatory and Development Authority (IRDA), the industry now has a regulatory framework to protect the interests of policy holders. This was followed by another landmark decision in 2001 establishing Third Party Administrators (TPAs) to facilitate speedier expansion by providing an administrative–intermediary structure to the insurance industry. After the establishment of IRDA, many private corporations have also entered the HI market. Bajaj Allianz, Royal Sundaram, ICICI Lombard, Cholamandalam, Tata and Reliance are the prominent private players in insurance business. An important feature of these corporations is their tie-up with some health care providers having super specialty hospitals. . The main features of private health insurance provision could be summarised as

(a) In most insurance offerings currently in trend all pre-existing diseases or health conditions are excluded from coverage and thus provide less financial risk protection. This implies that those most in need of insurance, i.e. the sick, get excluded from any financial risk protection against the diseases they are suffering from.

(b) It is a fee-for-service-based payment system. Such a system of payment is advantageous for the provider since he bears no risk for the prices he can charge for services rendered by him. Combined with the asymmetry in information, such a system usually entails increased costs.

(c) The system is based on risk-rated premiums. This again puts the risk on the insured as the premium is fixed in accordance with the health status and age. Under such a system, women in the reproductive age group, the old, the poor and the ill get to pay higher amounts and are discriminated against.

(d) The system is voluntary, making it difficult to form viable risk pools for keeping premiums low.

Community Based/ Micro Health Insurance: The Role of NGOs

Community Health Insurance in India emerged as an effort to improve access to healthcare and to protect HHs from catastrophic medical expenditure. CHIs are voluntary in nature, organized at the level of the community. They are also alternatively labelled as mutual health organizations (Atim 1999; Criel & Van Dormael 1999), medical aid societies (Atim 1999), medical aid schemes (van den Heever 1997) or micro-insurance schemes (Dror & Jacquier 1999). The common characteristics of these schemes are that they are run on a non-profit basis and they apply the basic principle of risk sharing.

There are basically three types of CHI in our country which are pictorially shown in Fig-6. One is a provider model where the CHI is started by hospital e.g. ACCORD, the MGIMS Wardha scheme. The hospital insures the community by collecting a premium from them. In return, the patients get free OP care and very subsidized IP care. So, anytime, any member is sick and needs admission, they can come to the hospital and do not have to pay any fees.

The other type, which has started recently, is the insurer model, where the community pays premium to the NGO/community organisation. The members then seek health care from any hospital (network hospitals) and the NGO/community organisation in turn pays the hospital the patients' bills. The biggest example of this is the Yashaswani scheme in Karnataka which insured 17 lakh farmers in the first year of its operation. In 2010-11 30.4 lakh people have enrolled under this scheme. The scheme is now operated on a public-Private-Partnership (PPP) basis, with implementation by a Third Party Administrator (TPA) 'Family Health Plan Limited'. The government contributes a subsidy of Rs. 30 per annaum per individual while the Member's contribution, constituting the premium, amounts to Rs. 150 per annum. The limit of insurance cover is 2 lakh per annum per individual, with a cap of Rs. 1 lakh per surgery per individual, both restricted to one incidence per annum.

The last model is the linked model where the NGO collects the premium and passes it on to insurance companies like the New India Insurance or the National Insurance Company. Patients usually approach private providers and get care. Unfortunately, here it is not a cashless system, so they have to pay the provider at the time of illness. The patient then submits the bills to the insurance company via the NGO and receives reimbursement, usually after a lag period of 1- 3 months. Advantage of this scheme is that the risk is taken by the insurance company and not by the NGO; so even small groups like 5000 people can get insured in this insurance model.

However, though community based schemes are managing on their own, they more often depend heavily upon external funds and donations. Again the pool is normally very small and therefore revenue collection is low and loading cost high, leading to provision of less beneficial products.

Literature Review

Conceptual and Theoretical Framework:

Insurance plays a twin role in health financing. One is to raise revenue for health care services that could be used to increase the quality and quantity of services and make public health facilities more accessible to the general public. The other one is to pool these resources so that health risks can be effectively shared among the members of the insurance scheme (Folland et. al, 2004). In addition, it protects HHs against large out-of-pocket expenses resulting from catastrophic illnesses. In the absence of insurance, a catastrophic illness imposes a heavy financial burden on affected HHs, especially on low-income HHs. Consequently, it may force the affected HHs to incur debt, reduce food and non-food expenditures, and sell of productive assets. Ultimately it reduces HH welfare. Since uncertainty is involved in health, risk sharing through health insurance is both an equitable and an effective way of financing health care. Hence, health insurance has two important policy outcomes. One is to improve access to care and to reduce individual spending at the time of use, which is particularly important for those with limited ability to pay.

On the flip side, the inclusive philosophy behind insurance gives rise to a problem euphemistically called moral hazard (Pauly, 1968) which may arise both from consumer and supplier side. Demand side moral hazard occurs when members of a HI plan use services more frequently and more expensive services than they would have had they not been the members. Supply side moral hazard is supply-induced demand especially under a fee-for-service system in which providers have

financial incentive to do more medical and surgical procedures. Since providers have little or no influence on the level of fees, there is a potential risk for excessive provision of services in the form of longer hospital stays, overuse of diagnostic tests, (expensive) drugs and other services. Both types of moral hazards lead to unnecessary consumption of healthcare and consumers end up with higher out of pocket expenditure which is not desired.

Empirical Literature

There are various cross country empirical studies on impact of health insurance on healthcare expenditure; some are in favour and some against and hence lack unanimous conclusion. Studies by Jutting (2001) for Senegal, Sepehri et.al (2006) for Vietnam and Ekman (2007) for Jordan show that health insurance help reducing the OOP health spending. Jutting (2001) used a logit/log linear model to measure the impact of health care utilization and financial protection. He found that members have a higher probability of using hospitalization services than non members and pay substantially less when they need care. Sepehri et.al, (2006) used the Vietnam Living Standards Surveys (VLS) for 1993 and 1998 and two competing non-linear models to explain health expenditures, namely Tobit and truncated regression models. They found that health insurance reduces health expenditure between 16 and 18% and the reduction in expenditure is more pronounced for individuals with lower incomes. Ekman (2007) used a two-part model' (TPM) to assess the effect of insurance on utilization and expenditures. In first part of TPM, the probability of a health care visit conditional on being ill, is estimated by probit model and in the final step, out-of-pocket expenditures conditional on positive utilization of outpatient care is estimated by OLS of the log-linear model. In Ghana, National Health Insurance Scheme (NHIS) was able to provide protection against the financial burden of health care, reducing significantly the likelihood of incurring catastrophic payment. The effect is particularly remarkable among the poorest quintile (Nguyen et.al, 2011). The Health Card Scheme (CAM) in Burundi studied by Arhin illustrated that in the month preceding the study, of the HHs who held valid CAM cards, 27.9% had incurred out-of-pocket expenses for medical consultations and/or drug purchases, while of those HHs without valid cards, and the corresponding figure was 39.85%. The mean expenditure per treatment was also lower for scheme members (Arhin, 1994). A study by DeRoeck *et al* (1996) found that the Ecuador Seguridad Social Campesino (SSC) rural health facility significantly increased financial protection for its members; out-of-pocket expenditure for health care of SSC members were only one-third those of non-members.

In contradiction to above literature, studies by Wagstaff *et al* (2009) found that health insurance had no impact on out-of-pocket spending or on utilization among the poor. They used National Health Service Survey (NHSS) data of China and differences-in-differences with matching methods to obtain impact estimates. Again for China, Wagstaff and Lindelow (2008) found that that China's new health insurance schemes (private schemes, including coverage of schoolchildren) have also increased the risk of high levels of out-of-pocket spending on health. Their results also showed that health insurance was increasing the risk of 'high' out-of-pocket expenses. In case of Indonesia, Askeskin, a health insurance programme for poor has led to increase OOP health payments slightly in urban areas due to an increase of relatively more expensive hospital care for which the costs have not been fully covered by the programme (Sparrow *et al*, 2010). Studies by Carrin *et al* (1999), Jütting

(2001) and Jowett *et al* (2002) found financial protection is marginal or limited, while, Ranson (2001) has found no evidence of an effective protection effect. Most importantly the findings suggest that most schemes fail to cover the least well-off groups in the catchment areas.

There are a few studies in the Indian context which have investigated the impact of health insurance, especially community based health insurance, on financial protection. The Study by Aggarwal (2010) evaluated the impact of India's Yeshasvini CBHI scheme on health-care utilisation, financial protection, treatment outcomes and economic well-being using propensity score matching techniques. As far financial protection is concerned, she found that the scheme has reduced OOP spending, and ensured better health and economic outcomes. Further, her analysis shows that borrowing to pay for inpatient surgical care has reduced by 30 percent for low-income beneficiaries compared to non-beneficiaries. She concludes that the scheme has had a significant price-reduction effect, but only for surgical care.

Devadasan *et al* (2007) in their study, taking two CBHI schemes (ACCORD and SEWA) into consideration, found that these schemes were able to protect their members against catastrophic health expenditure, but only to a limited extent. However, they argue that this protection can be further enhanced if some design changes are incorporated. To begin with, the upper limit of the benefit package needs to be raised. To keep the premiums affordable, donors or the government would need to directly subsidise the premium, especially for the poorer sections of society.

Recent studies by Selvaraj S and Karan A (2012) found that the impact of publicly-financed health insurance schemes (RSBY, Rajiv Aarogyasri in Andhra Pradesh, and Chief Minister Health Insurance schemes in Tamilnadu) was insignificant on financial risk protection.. They used a case-control approach where they considered two types of districts, namely intervention districts (IDs) (districts where RSBY and other health insurance schemes were rolled out and continuing until June 2009-10) and non-intervention districts (NIDs). In addition to that they also considered a pre-insurance and post-insurance approach for the periods 2004-05 and 2009-10, respectively. They used the unit level records of the Consumer Expenditure Survey (CES), conducted by the National Sample Survey Office (NSSO), for the respective years. However, the methodology employed by them has been questioned on several grounds and described as crude and un-standardised (Dilip, 2012). He argues that such crude and un-standardised comparisons are permissible only if the authors can ensure that: (1) a substantial proportion of the households were covered by the RSBY during this inter-survey period, so that the NSSO consumer expenditure survey would have been able to capture the differentials investigated in the paper, and (2) the proportion of households consuming/seeking inpatient care remains unchanged at the time of both these two cross-sectional NSSO surveys (a variation in proportion calls for a standardised comparison of OOP expenditure estimates).

Rao M *et al* (2012) while evaluating the Rajiv Aarogyasri community health insurance scheme in Andhra Pradesh, found that 111 beneficiaries per 100,000 BPL population had utilised the scheme out of which Nearly 60% beneficiaries incurred a median out-of pocket expenditure of rupees 3600. Transport, medicine and pre-diagnostic investigations are the factors that drive the major expenditure on health. The evidence shows that the scheme has marginal effectiveness in providing financial risk protection to its beneficiaries. They argued that if the scheme had to be successful there should be

improvement in the scheme with respect to strategic purchasing, quality of care, integration, continuous audit and in-built evaluation. They also emphasised on developing more coherent, cohesive and integrated health system with convergence of preventive, promotive and curative services taking into account the wider determinants of health.

Most of the studies related to the impact evaluation of publicly funded or community based health insurance programmes are sensitive to the methodology as well as the data used for analysis (Vellakkal S and Ebrahim S, 2013). Hence generalisation of the findings is an issue that need to be dealt with caution.

However, evidence in the existing literature on the subject (reviewed above) is far inconclusive about the impact of insurance on out-of-pocket health expenditures and protection against catastrophic expenditure for the insured. Most importantly, Indian studies in general are case specific and do not focus on whether health insurance in general has been able to ward off catastrophic expenditure.

Data Source and Methodology

This paper attempts to assess the effect of health insurance on out-of-pocket health expenditure using the Indian Human Development Survey (IHDS) 2004-05. The survey is nationally representative with 41,554 HHs and 2, 15,754 individuals. The survey was conducted for multi-topics and was jointly organized by University of Maryland and the National Council of Applied Economic Research (NCAER), New Delhi. IHDS was conducted in all states and union territories of India (with the exception of Andaman Nicobar and Lakshadweep). The sample was drawn using stratified random sampling and spread across 1503 villages and 971 urban blocks.

The household survey collected detailed information on the insurance status of all households which include OOP payment for outpatient (one month recall period) and inpatient services (12 months recall period). From this information, we computed a variable for annual OOP health expenditure (one month outpatient expenditure multiplied by 12 months plus 12-month expenditure on inpatient services). Note that using one month expenditure on illness to extrapolate to a 12-month figure could be problematic due to seasonality of illness and related health care seeking. However, since the survey was done for several months, any potential seasonality problem should be the same for health insurance members and non-members. This survey data also provide information on HH total expenditure on food and non-food items along with various HH characteristics like place of residence, caste, religion etc. Since information on food expenditure had been taken only for one month, yearly food expenditure was calculated by multiplying it by twelve months, and lastly added to non-food expenditure to get total expenditure of the HH. Also, only those HHs in which at least one member has experienced illness have been considered for this analysis. So the total sample size is 23940 HHs.

Definition and measurements issues:

This paper is focused on healthcare burden of the HHs. More often in literature, we find that the catastrophic expenditure indicator is a commonly accepted tool for measuring the financial burden of health care, relative to the household capacity to pay. OOP payment may be low due to the fact that insurance does not trigger any increase in utilization. For this reason, no additional payment is needed.

Alternatively, high OOP payment is not essentially bad if it was able to purchase substantial improvements in quality and quantity of services and above that if the HHs can afford to pay (Wagstaff and Lindelow, 2008). Observing only the reduction in the absolute amount of OOP expenditure due to having health insurance, is not sufficient to judge its effect on the financial burden of health care. Thus, the issue of financial burden is more directly related to capacity to pay than to the absolute amount.

While there is no consensus regarding the exact threshold for defining financial catastrophe, most agree that it should be measured in relation to a HH's capacity to pay. In past studies, the threshold has varied from 10% to 40% of total HH income and non-subsistent expenditure (Pradhan and Prescott 2002; Wagstaff and Van Doorslaer 2003; Wagstaff and van Doorslaer, 2003; Xu *et al* 2003). This study takes sums exceeding 10% of the HH's capacity to pay as the threshold for courting financial catastrophe since a higher percentage of total population in India is below the poverty line where a meagre amount of health expenditure can be catastrophic in nature. A HH's capacity to pay is defined as its effective income minus subsistence expenditure. Total consumption expenditure of the HH is taken to be the proxy of effective income, which is a more accurate reflection of purchasing power than income reported in HH surveys.

Catastrophic Payment

The data required is at the HH/individual level containing information on both health care payment (say H) and living standard (e.g. per capita income or consumption expenditure, say I). Living standards may also be measured by an "ability/capacity to pay" variable (say Y) such that,

Y = I - D (I), where D (I) represents necessary or non-discretionary expenditure on items such as food. In our analysis we have considered Y=non-food expenditure of HHs as capacity to pay.

The sample of HHs is said to have incurred catastrophic payments on healthcare when the fraction H/I or H/Y exceeds a pre-specified threshold, say Z. This sample of individuals represents the catastrophic payment headcount. Now we define an indicator E such that E=1 if $H_i/I_i > Z$ and zero otherwise.

The catastrophic payment headcount,

$$H = \frac{1}{N} \sum_{i=1}^{n} E_i$$

Where, N is the sample size.

Incidence and intensity of catastrophic impact

Another measure, the catastrophic payment gap captures the average degree by which payments as a proportion of income exceeds the threshold, Z.

Now we define the excess or overshoot as i.e., the amount by which the payment fraction (H_i/I_i) exceeds the catastrophic threshold Z.

$$O_i = E_i ((H_i/I_i) - Z)$$

The catastrophic payment gap is given by,

$$G = \frac{1}{N}\sum_{i=1}^{n} Oi$$

Thus while H only captures the incidence of any catastrophes occurring, G also captures the intensity of the occurrence.

$$MPG = \frac{G}{H}$$

Because this implies G = H*MPG, it means that the overall mean catastrophic 'gap' equals the fraction with catastrophic payments times the mean positive gap.

Impoverishing effects of Out-of-Pocket Health Expenditure

A non-poor HH is impoverished by health payments when it becomes poor after paying for health services. The variable created to reflect poverty impact of health payments (*impoor*) is defined as 1 when HH expenditure is equal to or higher than poverty line but is lower than poverty line net of out-of-pocket health payments and 0 otherwise.

$$impoor = 1 \; if \; I \geq Povline \; and \; I - H < Povline, otherwise,$$

$$impoor = 0$$

For our analysis, we have used IHDS calculated HH poverty line which is based on the monthly consumption per capita and the official poverty line prescribed by Planning Commission for 2004-05. The poverty line varies by state and urban/rural residence. It is based on 1970s calculations of income needed to support minimal calorie consumption and has been adjusted by price indexes since then. Generally, poverty line is fixed for a person. Since our analysis is based on HH level and various expenditure related variables converted into yearly, we have constructed HH yearly poverty line as follows:

HH Poverty line yearly= MPCE*number of HH members*12 months

Econometric Models

In the econometric models used in this paper, use three measures of the financial protection effects of insurance are used. They include (i) the absolute amount of OOP expenditure (ii) the likelihood of high or catastrophic expenditure and (iii) the likelihood of impoverishment.

A generic model for estimating the impact of health insurance for an individual i with the outcome of interest Y can be estimated as follows:

$$Yi \; = \; F(Hi, Xi, i)$$

Where, the F function in health service research typically takes the form of linear, probit, logit, or Tobit depending on the distribution of the outcome variable, H denotes insurance status, X is a vector of observable characteristics and   is the stochastic term, usually assumed to be normally distributed.

In the first measure, to see impact of health insurance on OOP expenditure, a two part model is used. Two part model has been used because it adds flexibility by modelling separate processes to explain the probability of positive expenditure and the average OOP amount (Cameron and Trivedi, 2005). In the first part, the probability of a positive expenditure is estimated with a probit/logit model. In the second part, a log linear model is used for non-zero expenditure. In the second measure, to see the impact of insurance on the probability of catastrophic expenditure we have used logit model since the dependent variable is categorical in nature. Similarly, we have also used a logit model to see the impact of health insurance on impoverishment.

When modelling the effect of health insurance on healthcare use and expenditure, one encounters the problems of endogeneity and self-selection (Waters, 1999; Yip and Berman, 2001). Here, the insurance variable would be endogenous if covariance of the insurance variable and the error term differs from zero. This would render the coefficient biased and inconsistent. However, since the data used herein do not provide information regarding the nature of insurance (voluntary or not) endogeneity test cannot be performed. Moreover, in India during 2004-05 health insurance was not wide spread. It had been mostly employer based (compulsory in nature) and some cooperative and NGO based (though voluntary in nature, members are generally automatically selected) until 2007 when various state governments and central government implemented various health insurance schemes (voluntary in nature) which targeted mostly BPL families. Hence, we assume that health insurance status of HH in this given data is broadly exogenous.

For this analysis, Stata11 and SPSS16 statistical software packages have been used. However, for regression purpose we have mainly used Stata11 since it provides very precise results and allows various post-estimation techniques (like; average probability value of dependent variables given various combination of values of independent variables) that are useful to draw inference on various policy variables.

Results and Discussion

Out of Pocket (OOP) Expenditure

Table-2 shows the average HH health expenditure and its share in the total consumption and non-food expenditure. It is found that on an average a HH spends yearly around 4070 rupees and 3067 rupees on outpatient and inpatient care respectively, which is 7.3 percent and 5.5 percent of its total consumption expenditure. . The share of outpatient care is higher than inpatient care whereas most of the existing health insurance programme either private or public and focuses mainly on inpatient services leaving a significant proportion of HH OOP expenditure unprotected. If we combine outpatient and inpatient expenditure, an HH spends around 12.8 percent of its total consumption expenditure on healthcare. However, if you take HH capacity to pay (non-food expenditure) for health expenditure into consideration, it can be seen that inpatient, outpatient and total expenditure account for around 10, 13 and 23 percent respectively.

It is also evident that with the increase in income, expenditure share on healthcare increases since rich can afford more than the poor. HHs in to richest income quintile spend more on both outpatient (7.7 percent) and inpatient care (7.9 percent) than their counterpart. Another interesting

finding is that the share of outpatient care is higher than inpatient care in case of poorest quintile than the richest quintile. This implies that the poor spend more on outpatient than inpatient care since they face communicable diseases frequently which demands outpatient care most of the time. Accessibility and affordability among the richer and richest are other factors that contribute to the increasing expenditure share for inpatient care.

Table 2: Average Household OOP Expenditure on Healthcare and Its Share to Total Consumption and Non-Food Expenditure (capacity to pay), by Socio-Economic and Insurance Status, 2004-05

Socio-economic Groups	HH TE[***] (in Rs.)	HH capacity to pay (in Rs.)	Out patient Expd (in Rs.)	Inpatient Expd (in Rs.)	Share of HH out patient expd to TE (in %)	Share of HH out patient expd to CTP (in %)	Share of HH inpatient expd to TE (in %)	Share of HH inpatient expd to CTP (in %)	Share of HH OOP expd[†] to TE (in %)	Share of HH OOP expd to CTP (in %)
MPCE (Quintile)										
Poorest	22686	7920	1323	482	5.8	16.7	2.1	6.1	8.0	22.8
2nd poorest	34881	14547	2284	1159	6.5	15.7	3.3	8.0	9.9	23.7
Middle	44644	21121	3273	1679	7.3	15.5	3.8	7.9	11.1	23.4
2nd Richest	61087	33305	4572	2988	7.5	13.7	4.9	9.0	12.4	22.7
Richest	115767	81430	8961	9113	7.7	11.0	7.9	11.2	15.6	22.2
Social Groups										
Others	72530	43471	4584	3991	6.3	10.5	5.5	9.2	11.8	19.7
OBC	51312	28467	3980	2949	7.8	14.0	5.7	10.4	13.5	24.3
SC	45404	24188	4028	2532	8.9	16.7	5.6	10.5	14.4	27.1
ST	33852	16530	2340	1168	6.9	14.2	3.5	7.1	10.4	21.2
Place of Residence										
Rural	48155	25607	4054	2837	8.4	15.8	5.9	11.1	14.3	26.9
Urban	70304	43150	4096	3526	5.8	9.5	5.0	8.2	10.8	17.7
HI status										
No	54229	30416	4025	3025	7.4	13.2	5.6	9.9	13.0	23.2
Yes	101706	68082	5479	4517	5.4	8.0	4.4	6.6	9.8	14.7
Region Wise										
North	68975	38727	4285	3151	6.2	11.1	4.6	8.1	10.8	19.2
East	49651	26756	4124	2252	8.3	15.4	4.5	8.4	12.8	23.8
Central	36997	19047	2694	1768	7.3	14.1	4.8	9.3	12.1	23.4
West	52747	30066	2968	3099	5.6	9.9	5.9	10.3	11.5	20.2
South	54496	33677	5072	4434	9.3	15.1	8.1	13.2	17.4	28.2
Total	**55682**	**31548**	**4070**	**3067**	**7.3**	**12.9**	**5.5**	**9.7**	**12.8**	**22.6**

Source: Authors' calculations using data from the IHDS (2004-05)
[***]TE is defined as household Total expenditure; [†] OOP Expd= (Outpatient expd + Inpatient Expd)

In India, caste hierarchy reflects class hierarchy also. Lower castes (SC, ST and OBC) enjoy less socio-economic development than higher caste (others). HHs belonging to lower castes are mainly poor than their lower-caste counterparts and hence live in poorer conditions and with poor health outcomes. The result shows that they spend a higher percentage of their non-food expenditure on healthcare (ST-21.2%, SC-27.1% and OBC-24.3%) than the upper class (others-19.7%). Also, rural

HHs spend more than their urban counterparts. As far as health insurance status and health expenditure is concerned, HHs with insurance cover spend lesser percentage (9.8% and 14.7% with respect to their total expenditure and capacity to pay) than those without insurance cover. This proves insurance helps to reduce health expenditure. There is significant regional variation in health expenditure; a HH from south India spends around 17% and 28% of its total expenditure and non-food expenditure respectively on health which is higher in comparison to the health spending of HHs in other parts of India.

Incidence and Intensity of OOP Financial Burden

In most studies on the subject, financial burden is described through HH OOP expenditure – whether it is catastrophic or not. So in Table-3, we will see the incidence and intensity of the incidence (H) and Intensity (G) of financial catastrophe caused by OOP expenditure by socio-economic and health insurance status at 10 percent threshold level.

Table 3: Incidence (H) and Intensity (G & MPG) of Catastrophic Expenditure at 10% Threshold Levels of HH Total Consumption Expenditure and Non-Food Expenditure

	HH total consumption expenditure			HH non-food expenditure		
	H	G	MPG	H	G	MPG
Consumption Quintile						
Poorest	27.59	2.6	9.4	62.9	13.5	21.4
2nd poorest	35.45	3.9	11.0	64.9	14.5	22.3
Middle	39.23	5.1	13.1	63.5	15.2	23.9
2nd Richest	39.94	6.5	16.4	59.5	15.0	25.3
Richest	39.13	9.4	23.9	50.5	15.3	30.3
Caste Groups						
Others	33.71	5.1	15.2	55.5	12.9	23.3
OBC	38.26	5.7	14.9	61.9	15.1	24.4
SC	38.88	6.1	15.7	65.2	16.7	25.6
ST	28.33	3.9	13.8	57.9	13.7	23.6
Place of residence						
Rural	39.22	6.1	15.6	65.4	16.9	25.8
Urban	30.39	4.3	14.1	50.1	10.3	20.6
Health Insurance						
No	36.51	5.5	15.1	60.9	14.8	24.3
Yes	27.36	4.0	14.8	41.5	8.4	20.3
Region wise						
North	31.82	4.6	14.5	56.1	13.0	23.1
East	36.88	5.4	14.6	64.6	16.5	25.5
Central	32.23	4.5	14.0	60.1	14.2	23.6
West	31.44	4.5	14.4	53.6	11.6	21.6
South	46.64	7.9	17.0	65.8	17.3	26.3
Total	**36.20**	**5.5**	**24.3**	**60.3**	**14.7**	**24.3**

Source: as Table 2.

The incidence of catastrophic expenditure is highest in poorest quintile (63%) than the richest quintile (51%) when we consider their capacity to pay, while this is other way round if total consumption is considered. This is because poor HHs spend higher proportion of their consumption expenditure on food (subsistence expenditure) and less is left for non-subsistence expenditure. Hence, their capacity to pay becomes less to afford higher amount of expenditure on health. Therefore, a higher proportion of the poor face catastrophic expenditure than the rich. But, interestingly, the average degree of OOP expenditure exceeding the threshold level, called intensity, is higher among richer and richest quintile than poorer and poorest quintile as a percentage to their total consumption expenditure. But the difference in intensity is not much high when considered with respect to their capacity to pay.

As far as caste groups are concerned, socially backward castes like; ST, SC and OBC experience higher incidence and intensity of catastrophic expenditure than higher castes.

Similarly, incidence and intensity of health expenditure burden is higher among HHs from rural than urban area. The result shows that HHs with insurance have lesser incidence and intensity of catastrophic OOP expenditure than uninsured HHs. The study also found significant regional disparity in incidence and intensity of catastrophic expenditure; HHs from Central, East and Southern states face higher percentage of incidence and intensity of catastrophic OOP expenditure than Northern and West Indian states.

OOP Expenditure and Impoverishment:

Table-4 shows the percentage of HHs impoverished due to OOP health expenditure, by socio-economic and insurance status. The first column of the table shows the percentage of poor HHs before incurring OOP expenditure, while column two, three and four provide information on the addition of poor HHs due to outpatient, inpatient and total OOP expenditure respectively. The overall addition of impoverished HHs due to OOP expenditure is around 6%. Socio-economically disadvantaged HHs face higher percentage of impoverishment due to health expenditure than their counter parts. Percentage of HHs from the richest quintile falling below the poverty line due to OOP expenditure is a meagre 1% whereas it is 11% for the poorest quintile. Similarly, SC, ST and OBC faced higher percent of impoverishment than higher castes. Also, rural HHs experienced more impoverishment than urban HHs. In contrast insured HHs (only 2%) endured less impoverishment than the uninsured (7%). Significant regional variation in impoverishment is also found. As in the case of catastrophic expenditure, impoverishment is higher among the HHs from eastern, central and southern India. Most importantly, more percentage of HHs experienced impoverishment due to outpatient than inpatient expenditure. The net addition to total poverty level due to outpatient expenditure is 4% whereas it is only 2% in case of inpatient expenditure.

Table 4: Percentage of Household Impoverished Due to OOP Health Expenditure, by Socio-Economic and Insurance Status, 2004-05.

Socio-economic Groups	Before OOP C1	Net Addition Due to		
		Out-patient C2	Inpatient C3	Overall C4
MPCE (Quintile)				
Poorest	77.9	8.2	2.7	10.9
2nd poorest	17.5	7.4	3.4	12.3
Middle	1.6	3.1	1.6	6.2
2nd Richest	0.0	0.9	0.5	2.0
Richest	0.0	0.1	0.3	0.7
Social Groups				
Others	10.2	2.5	1.0	3.9
OBC	20.2	4.3	2.0	7.3
SC	24.7	5.2	2.3	8.6
ST	44.0	5.1	1.7	7.0
Place of Residence				
Rural	20.0	4.5	1.7	7.0
Urban	18.8	3.0	1.7	5.3
HI status				
no	20.1	4.1	1.8	6.6
yes	4.4	0.8	0.4	1.8
Region wise				
North	15.4	3.5	1.3	5.2
East	21.3	5.9	1.8	8.8
Central	43.9	4.7	2.1	7.2
West	15.7	3.4	1.5	5.4
South	12.9	2.7	2.1	6.1
Total	**19.6**	**4.0**	**1.7**	**6.4**

Source: as Table 2

Regression Results:

Table-5 presents the summary statistics of various independent variables that have been used to explain the dependent variables like probability and degree of OOP expenditure, probability of catastrophic expenditure and the probability of impoverishment. Table-5a provides information on the expected relationship (sign) between various independent variables and various dependent variables considered for analysis.

Table 5: Descriptive Statistics of Explanatory Variables

Variable	Description of variables	Obs.	Mean	Std. Dev.	Min	Max
mpce_q5	Monthly percapita consumption expenditure (in quintile)	23940	2.99	1.42	1	5
caste	Caste groups	23940	2.03	0.90	1	4
urban	Place of residency	23940	0.34	0.47	0	1
old_prsn	No. of old persons in HH	23940	0.48	0.71	0	4
nchildre	No. of old children in HH	23940	1.79	1.63	0	17
out_expd	Outpatient expd. incurred (yes/no)	23940	0.57	0.49	0	1
inp_expd	Inpatient expd. incurred (yes/no)	23940	0.30	0.46	0	1
religion	Religion groups	23940	1.27	0.59	1	3
HI	Health insurance (yes/no)	23940	0.03	0.17	0	1
toilet	Toilet in HH (yes/no)	23940	0.43	0.50	0	1
kitchn_separate	Separate kitchen (yes/no)	23940	0.59	0.49	0	1
hhsize	No. of persons in HH	23940	5.46	2.62	1	33
edu_max	Highest educational qualification of the member in HH	23940	9.88	3.73	0	15
Region	States clubbed into regions	23940	2.73	1.55	1	5

Source: as Table 2

Factors Determining OOP Expenditure

Table-6 (part I) presents the effect of various socio-economic factors along with health insurance on the probability of positive OOP expenditure and Part II presents the average OOP expenditure. Part-I and II of the two part model result show that other things remaining constant, health insurance has a statistically significant (at 1% level respectively) and negative impact on OOP expenditure, which implies that the likelihood of incurring positive OOP expenditure is higher among uninsured than the insured. HHs with insurance incurs less average OOP expenditure than those without insurance. As expected, with increase in HHs income the expenditure on health increases since capacity to pay also increases with increase in income. Both Part-I and II regression make it that the coefficient of consumption quintiles are positive and highly significant at 1% level. Some of the other socio-economic and HH environmental variables that significantly impact the OOP expenditure are caste, religion, place of residence, educational level of the HH members, HH size, number of old persons and children in the HH, and availability of toilet and separate kitchen in the HH. Socially backward HHs namely, SC, OBC and ST are less likely to incur positive OOP expenditure than their higher caste counterparts. Another interesting finding is that the average amount of OOP is higher among SC and OBC than for other castes except ST, since STs have less accessibility and availability to healthcare facilities. The main reason behind high amount of OOP expenditure among SC and OBC is the frequent outpatient expenditure that they incur compared to other castes (see Table-2 for details). The probability of incurring positive OOP expenditure among rural HHs is high compared to urban HHs. This is because rural people fall sick quite often and incur frequent outpatient expenditure compared to urban population. With increase number of HH members particularly addition of old persons and children the probability and degree of OOP expenditure increases. HH environment plays a major role in healthcare

condition of the members and hence the OOP expenditure. Those with separate kitchen and toilet spend less OOP expenditure than those without. Urban HHs on an average spend less on health than rural HHs. There is also significant regional disparity in OOP expenditure in India; HHs from northern states have lesser probability of incurring positive OOP expenditure than HHs from rest of India. However, the magnitude of expenditure is higher among eastern and southern states compared to northern states.

Table 5a: Expected Sign of Explanatory Variables for Different Regression Models

Variable	Two Part model		Probability of Catastrophic Expenditure	Probability of Impoverishment
	Probability of OOP Expenditure (logit)	Average OOP Expenditure (Log Linear Model)		
mpce_q5	(+)	(+)	(-)	(-)
caste	(+)	(+)/(-)	(-)	(-)
urban	(-)	(-)	(-)	(-)
old_prsn	(+)	(+)	(+)	(+)
nchildre	(+)	(+)	(+)	(+)
out_expd	NA	NA	(+)	(+)
inp_expd	NA	NA	(+)	(+)
religion	(+)/(-)	(+)/(-)	(+)/(-)	(+)/(-)
HI	(-)	(-)	(-)	(-)
toilet	(-)	(-)	(-)	(-)
kitchn_separate	(-)	(-)	(-)	(-)
hhsize	(+)/(-)	(+)/(-)	(+)/(-)	(+)/(-)
edu_max	(+)	(-)	(-)	(-)
Region	(+)/(-)	(+)/(-)	(+)/(-)	(+)/(-)

Source: as Table 2

Table 6: Two Part Regression Results for OOP Expenditure

Independent Variables	Part-I (Logit Model): Probability of positive OOP Expenditure (Dependent Variable)			Part-II (Log Linear Model): Average OOP Expenditure (Dependent Variable)		
	Coeff.	Std. Err.	P>|z|	Coeff.	Std. Err.	P>|z|
Poorest @						
2nd poorest	0.549	0. 057	0.000	0.672	0. 026	0.000
Middle	0 .875	0. .062	0.000	1.105	0.027	0.000
2nd Richest	1.214	0.068	0.000	1.554	0.028	0.000
Richest	1.537	0 .075	0.000	2.288	0.031	0.000
General @						
OBC	-0.027	0.048	0.567	0.039	0.019	0.045
SC	-0. 166	0. 058	0.004	0.087	0.024	0.000
ST	-0. 292	0.076	0.000	-0.155	0 .036	0.000
Hindu @						
Muslim	0.398	0.068	0.000	0.075	0.025	0.004
Others	-0.152	0.070	0.030	-0.064	0.031	0.040
Edu_max (continuous)	0.016	0.005	0.000	-0.007	0.002	0.000
HI (no) @						
HI (yes)	-0.297	0.107	0.000	-0.171	0.047	0.000
Rural@						
Urban	-0.314	0.045	0.000	-0.247	0.019	0.000
HH size	-0.062	0.012	0.000	0.110	0.004	0.000
oldprsn (continuous)	0.050	0.028	0.078	0.079	0.012	0.000
children (continuous)	0.147	0.019	0.000	0.042	0.007	0.000
Toilet (no) @						
Toilet (yes)	-0.226	0.048	0.000	-0.181	0.019	0.000
Kitchen separate (no) @						
Kitchen separate (yes)	-0.268	0.042	0.000	-0.130	0.017	0.000
North@						
East	0.471	0 .056	0.000	0.181	0.022	0.000
Central	0.175	0 .065	0.007	-0.021	0.029	0.470
West	0.092	0.062	0.138	-0.079	0.026	0.003
South	0.311	0.055	0.000	0.422	0.023	0.000
constant	0.372	0.101	0.000	6.401	0.043	0.000
Log likelihood =	-9540.031			Log likelihood =	-31422.481	
Obs. =	23889			Obs =	20395	
LR chi2(21) =	803.52			F(17, 28112) =	540.02	
Prob > chi2 =	0.000			Prob > F =	0.000	
Pseudo R^2 =	0.040			Adj. R^2 =	0.2829	

Source: as Table-2

Note: @ reference category

Factors Determining Catastrophic Expenditure

As can be seen from Table 7, other thing remaining constant, insurance negatively affects the probability of catastrophic expenditure at 1% level of significance. Health insurance declines the likelihood of facing catastrophic expenditure by around 8%. Some of the other independent variables that affect negatively are better socio-economic condition of HHs, availability of toilet and separate kitchen in the HH, location of HHs in urban areas, level of education of HH members, religious faith of HHs (other faiths), location of HHs in central Indian States.. The presence of higher number of children and old persons in the HH positively affect the catastrophic expenditure. The probability of experiencing catastrophic expenditure increases almost equally because of outpatient and inpatient visits. However, most of the health insurance schemes in India either government-sponsored or private are inpatient-oriented and leave out a large part of OOP expenditure not covered under the scheme. Hence, there is need of rethinking on the design of health insurance if government private insurance schemes are to become attractive and socially relevant.

Table-9 presents a scenario when everybody in the sample is treated as poor without health insurance, and estimates the probable level of face catastrophic expenditure and impoverishment faced by HHs. Table 9 also gives an alternative a scenario in which everybody in the sample is assumed to have insurance cover, and estimates the probability of catastrophic expenditure in relation to all other socio-economic variables. As can be seen from the table, the probability of catastrophic expenditure increases significantly for HHs without HI than with HI irrespective of their socio-economic conditions.

Factors Determining Impoverishment

Other things remaining constant, insured HHs have 3% less probability of facing impoverishment due to OOP expenditure from illness than uninsured at 10% statistically significance level (see Table-8). Outcomes are similar for various socio-economic variables that govern the probability of both impoverishment and probability of catastrophic expenditure. HHs belonging to socio-economically advanced groups, from urban area, with better HH environment and highly educated members have less probability of experiencing impoverishment due illness than their counterparts.

Table 7: Logit Regression Result for Catastrophic Expenditure

Occurrence of Catastrophic Expenditure (yes=1/no=0) (Dependent variable)	Coefficients	Std. Err.	Marginal Effects	P>|z|
Independent Variables				
Poorest @				
2nd poorest	-0.186	0.054	-0.028	0.001
Middle	-0.357	0.057	-0.054	0.000
2nd Richest	-0.599	0.060	-0.092	0.000
Richest	-1.206	0.066	-0.192	0.000
General @				
OBC	0.104	0.041	0.016	0.012
SC	0.220	0.050	0.034	0.000
ST	-0.063	0.074	-0.010	0.394
Hindu @				
Muslim	0.363	0.054	0.055	0.000
Others	-0.095	0.063	-0.015	0.134
Edu_max (continuous)	-0.013	0.004	-0.002	0.005
HI (no) @				
HI (yes)	-0.502	0.099	-0.080	0.000
Rural@				
Urban	-0.434	0.039	-0.069	0.000
N persons (continuous)	-0.145	0.010	-0.022	0.000
Old prsn (continuous)	0.195	0.025	0.030	0.000
children (continuous)	0.050	0.016	0.008	0.002
out_expd (no) @				
out_expd (yes)	2.923	0.047	0.486	0.000
inp_expd (no) @				
inp_expd (yes)	2.543	0.046	0.365	0.000
Toilet (no) @				
Toilet (yes)	-0.316	0.041	-0.050	0.000
Kitchen separate (no) @				
Kitchen separate (yes)	-0.134	0.037	-0.021	0.000
North@	0.179	0.047	0.028	0.000
East	0.001	0.060	0.000	0.988
Central	-0.300	0.055	-0.048	0.000
West	0.174	0.051	0.027	0.001
South	0.179	0.047	0.028	0.000
constant	-1.576	0.080		0.000
Log likelihood =	-11224.109			
Observations =	23884.000			
LR chi2(16) =	9647. 09			
Prob > chi2 =	0.000			
Pseudo R2 =	0.301			

Note: @ reference category
Source: as Table-2

Table 8: Logit Regression Result for Impoverishment

Occurrence of Impoverishment (yes=1/no=0) (Dependent variable)	Coefficients	Std. Err.	Marginal Effects	P>|z|
Independent Variables				
Poorest@				
2nd poorest	-3.795	0.070	-0.572	0.000
Middle	-6.196	0.103	-0.828	0.000
2nd Richest	-7.872	0.140	-0.887	0.000
Richest	-9.127	0.205	-0.899	0.000
General @				
OBC	0.239	0.069	0.016	0.001
SC	0.589	0.080	0.039	0.000
ST	0.657	0.109	0.044	0.000
Hindu @				
Muslim	0.450	0.080	0.030	0.000
Others	0.212	0.115	0.014	0.065
Edu_yrs (continuous)	-0.012	0.007	-0.001	0.078
HI (no) @				
HI (yes)	-0.424	0.238	-0.027	0.075
Rural@				
Urban	3.013	0.077	0.199	0.000
N persons (continuous)	-0.033	0.015	-0.002	0.030
Old prsn (continuous)	0.173	0.039	0.011	0.000
children (continuous)	0.152	0.024	0.010	0.000
out_expd (no) @				
out_expd (yes)	0.649	0.061	0.041	0.000
inp_expd (no) @				
inp_expd (yes)	0.787	0.058	0.050	0.000
Toilet (no) @				
Toilet (yes)	-0.331	0.066	-0.022	0.000
Kitchen separate (no) @				
Kitchen separate (yes)	-0.106	0.055	-0.007	0.052
North@				
East	-0.438	0.074	-0.028	0.000
Central	0.021	0.088	0.001	0.811
West	-0.052	0.091	-0.003	0.570
South	-0.080	0.080	-0.005	0.318
constant	1.015	0.139		0.00
Log likelihood =	-5273.97			
Observations =	23889			
LR chi2(23) =	16864.70			
Prob > chi2 =	0.000			
Pseudo R2 =	0.6152			

Note: @ reference category
Source: as Table-2

Table 9: Average Probability of Facing Catastrophic Expenditure and Impoverishment Given Various Socio-economic Conditions

Treatment Variables	Catastrophic		Impoverishment	
	With HI	Without HI	With HI	without HI
Poor	0.60	0.68	0.87	0.91
Rich	0.40	0.48	0.00	0.01
Higher caste	0.51	0.59	0.21	0.24
ST	0.50	0.58	0.26	0.28
Rural	0.55	0.63	0.19	0.21
Urban	0.48	0.56	0.38	0.41
Rich, urban, higher caste, with toilet facility and separate kitchen	0.38	0.31	0.01	0.01
Poor, rural ,lower caste, no toilet and separate kitchen	0.63	0.71	0.87	0.91

Source: See as Table-2

Summary Conclusion & Policy Implications

In recent years, the Government of India has been promoting health insurance as a way of protecting the population against financial ruin resulting from catastrophic medical expenditure and ensuring access to public health services, especially for poorer HHs/individuals. However, few studies in Indian context are available which that investigated in aggregate level, whether health insurance as an instrument has fulfilled the above objectives. In this paper, we provide an empirical assessment of the extent to which health insurance affects out-of-pocket payments and gives financial risk protection for health services. IHDS, 2004-05 data, has been used for the purpose of this analysis, which incidentally is the only available data source.

Using bi-variate and econometric analysis, this study has clearly established that health insurance can decrease the size, of OOP spending, probability of facing catastrophic spending and impoverishment. Hence, the recent introduction of health insurance programme by various state and central governments is a welcome step; therefore health insurance should be universalised in order to reduce OOP spending and impoverishment. However, in recent years, health insurance provision by governments are mainly targeted to the BPL families and therefore covers a very small section of Indian population, leaving out large sections uninsured and deprived of its benefits. The rationale behind targeting BPL families as also their selection is evidently flawed as it currently excludes the genuinely needy from the ambit of insurance coverage. Findings of this study confirm the fact that the problem of higher healthcare burden is faced by not only poor HHs but also the higher income groups. Hence, universalization of health insurance is essential. Moreover, under this scheme the risk pool is comprised of BPL population with least ability to pay. If similar schemes are extended to other sections of the society fixing appropriate amounts as premium, the pools will become bigger and more financially sustainable as in the case of typical health insurance wherein the rich subsidizes the poor.

In addition to the above, it is also found from the analysis that the probability of experiencing catastrophic expenditure and impoverishment increases almost equally because of both outpatient and inpatient expenditure. However, most of the health insurance schemes in India either government or

privately provided are inpatient oriented, leaving a large part of OOP expenditure not covered under the scheme. Hence, there is need for rethinking on the design of health insurance if government and privately provided insurance scheme are to become more attractive and socially relevant. Since economically well off HHs are less vulnerable to OOP expenditure, government should increase the income generating capacity through effective employment mainly in rural areas since HHs from rural areas experience higher probability of incurring catastrophic OOP expenditure and impoverishment.

However, on the flip side, insurance umbrella gives rise to a problem called moral hazard which may arise both from provider and consumer side. Of the two hazards, the former is more common and dangerous than the latter as the consumer ends up incurring higher OOP expenditure, which is not desirable. Therefore, government must address this issue by putting in place a better regulatory framework over and above what is currently available under the Insurance Regulatory and Development Authority.

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