

# Impoverishing effects of out-of-pocket healthcare expenditures in India

Shyamkumar Sriram<sup>1</sup>, Muayad Albadrani<sup>2</sup>

<sup>1</sup>Department of Community Medicine, Great Eastern Medical School, Andhra Pradesh, India, <sup>2</sup>Department of Family and Community Medicine, Taibah University Medical School, Kingdom of Saudi Arabia

## ABSTRACT

**Background:** Out of the 1.324 billion people in India (2016), around 12.4% of the population is below the poverty line. In India, out-of-pocket health expenditure (OOP) expenses account for about 62.6% of total health expenditure – one of the highest in the world. High OOP health expenditures push many households into poverty. This study aims to identify the impoverishing effects of OOP health expenditures in India. **Methods:** Data from the recent national survey by the National Sample Survey Organization – Social Consumption in Health 2014 are used to investigate the effect of OOP health expenditure on household poverty. Poverty headcounts and poverty gaps were estimated at the household level before and after making OOP healthcare payments. A logistic regression model is for predicting the effect of various factors on the incidence of impoverishment due to OOP health expenditures. **Results:** There were 65,932 households in the sample. The total poverty headcount in the population before making OOP payments was 16.44% and it increased to 19.05% after making OOP payments. This 2.61% increase in the poverty headcount corresponds to 6.47 million households. Logistic regression results showed that medium and large households, household members with increased duration of stay in the hospital, utilization of private health facility and the presence of chronic illness increased odds of impoverishment due to OOP health expenditures. **Conclusions:** Health insurance programmes must be expanded to cover outpatient and preventive health services, include people above the poverty line, cover the whole household irrespective of the number of members living in the household and the coverage threshold limits must be increased. Urban poor must be enrolled in health insurance programmes without any delay.

**Keywords:** Financial protection, India, out-of-pocket health expenditure, poverty

## Introduction

One of the important goals of health systems is to protect the households from financial risks due to health expenditures.<sup>[1-3]</sup> India is currently taking measures to provide universal health coverage (UHC) to its population. Providing financial protection is considered the backbone of UHC. According to the World Health Organization's list of "countries with highest OOP expenditure on health," India ranks third in the region of Southeast Asia. In India, OOP expenses account for

about 62.6% of total health expenditure – one of the highest in the world.<sup>[4]</sup> In India, OOP health expenditures constitute a significant proportion of total household expenditure and this effectively reduces expenditures on other important necessities lowering the overall welfare of households.<sup>[5]</sup> The current policy debate is about "health for all with financial protection" from the concept of "health for all" which was more common in the last decade.<sup>[6]</sup> Affordability and financial risk protection are key principles under the National Health Policy 2017 of India.<sup>[7]</sup> The OOP healthcare payments are not considered to be an effective method of financing healthcare in order to enhance fair financing. Relatively large OOP payments have the potential to push vulnerable households into poverty and increase the depth of poverty of households already below the poverty line.

**Address for correspondence:** Dr. Shyamkumar Sriram, Department of Community Medicine, Great Eastern Medical School, Andhra Pradesh, India. E-mail: shyam.silverhawk@gmail.com

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Out of the 1.324 billion people in India, around 21.9% of the population is below the poverty line (2011) using the revised World Bank Poverty line of USD 1.90.<sup>[8,9]</sup> Evidence shows that high OOP health expenditures affect the household economy and push many households into poverty.<sup>[10-14]</sup> A study in India showed that around 2.2% of the population fell below the poverty line because of OOP payments for healthcare.<sup>[15]</sup> Nearly 39 million people in India become impoverished every year due to OOP health expenditures.<sup>[16]</sup> Another study by van Doorslaer *et al.*<sup>[17]</sup> showed that around 37 million people were pushed into poverty in 1999–2000 due to OOP payments alone. Indeed, evidence shows that OOP health expenditures can increase the incidence and depth of poverty; additionally, poverty has a negative impact on health.<sup>[18,19]</sup> OOP healthcare payments aggravate both the occurrence and depth of poverty and selling assets and borrowing money are the most important mechanisms households follow to pay for the expenses incurred.<sup>[20,21]</sup> Majority of the health insurance programmes in India cover only the hospital expenses.<sup>[22]</sup>

The idea of impoverishment goes further than incidence of catastrophic health expenditures and the concept is that nobody should be pushed into poverty or push deeper into poverty because of healthcare expenditures.<sup>[23]</sup> Some households may spend a higher proportion of their income on health without falling below the poverty line, but other households may spend only a small proportion of their income on healthcare to slide into poverty. Many studies demonstrated the adverse impact of high OOP healthcare expenditures on household welfare and also higher incidence of poverty on the households.<sup>[5,15,17,20,24-28]</sup>

If more people are pushed into poverty because of OOP expenditures, it becomes difficult for the Poor People's Health Insurance Program to provide coverage to households who slide into poverty. The OOP expenditures may push even some households who are not close to the poverty line into poverty. Because of the dynamic nature of poverty, it becomes difficult for the insurance programmes for the poor to remain flexible enough to allow frequent entry and exit without incurring high administrative cost. Also, identifying the effect of OOP health expenditures on poverty is vital for framing adequate policies to address them. The main research questions this research would address are the burden of OOP health expenditures on poverty and the various determinants of incidence of poverty due to OOP health expenditures. The specific questions are as follows: (i) what can be done to reduce sliding down into poverty? and (ii) what are the factors affecting the incidence of impoverishment in households due to OOP health expenditures in India? This study is an attempt to understand the impact of OOP payments on poverty in India using the latest National Sample Survey Organization (NSSO) – Social Consumption and Health Survey.<sup>[29]</sup> This analysis is useful for establishing policies and programmes for poverty alleviation specifically to create financial risk protection mechanisms in India. This investigation is especially useful for primary care physicians who provide healthcare at the outpatient level to many patients in India.

## Methods

### Data source

The data from the NSSO of the Government of India were used for the study.<sup>[29]</sup> NSSO is a national organization under the Ministry of Statistics and Implementation which was established in 1950 to regularly conduct surveys and provide useful statistics on socio-economic status of households, demography, health, industries, agriculture, consumer expenditure and so on. Social Consumption (Health), National Sample Survey (NSS) 71<sup>st</sup> Round for 2014 of NSSO data were used for this analysis. The survey used the interview method of data collection from a sample of 65,932 randomly selected households (36,480 in rural India and 29,452 in urban India) and 335,499 individuals, covering the members of the household in all the 36 states (including union territories). The state-wise poverty lines of India for the urban and rural areas for the year 2011–2012 provided by the Planning Commission of India report using Tendulkar Methodology are used for this research.<sup>[30,31]</sup>

### Factors affecting incidence of impoverishment due to OOP health expenditures

To study the effects of various factors on the occurrence of impoverishment due to OOP health expenditures, the logistic regression model will be used. The logistic regression model is preferred since the dependent variable is dichotomous. “Whether a household falls below poverty line after making OOP healthcare payments?” will be used as the dependent variable. A dichotomous variable for impoverishment will be created with 0 for not falling below poverty line after making OOP healthcare payments and 1 for falling below poverty line after making OOP healthcare payments. Thus, the dichotomous variable created for incidence of impoverishment in the household will serve as the dependent variable for the logistic regression model. The independent variables include the various characteristics of the households.

## Results

### Descriptive statistics

Descriptive statistics presented in [Table 1] are at the household level. There were 65,932 households in the sample. Thirty-three per cent of the households have at least child aged 5 years and less; 26.87% households have at least one elderly person. We observed that a number of households who were above the poverty line fell below the poverty line after making OOP healthcare payments. [Table 2] shows the incidence of poverty by demographic and household characteristics. The total poverty headcount in the population before making OOP payments was 16.44% and it increased to 19.05% after making OOP payments. This 2.61% increase in the poverty headcount corresponds to 6.47 million households. The proportion of households falling into poverty due to OOP increased across all the socioeconomic quintiles. This change in the poverty headcount is presented in detail in [Table 2]. [Table 3] shows the intensity of poverty

**Table 1: Descriptive statistics of categorical and continuous variables**

Variables	Definition and categories	Frequency (%) n=65,932	Weighted percentage (%)
Age groups (children)	Presence of at least one child (aged 5 years and less) in the household	31,361 (47.57%)	33
Age groups (elderly)	Presence of at least one elderly person (aged 60 years and above in the household)	20,234 (30.69%)	26.87
Marital status	Presence of someone divorced in the household	15,649 (23.74%)	22.44
Female education	Presence of at least one secondary educated female member in the household	27,723 (42.05%)	33.94
Location of the household	Rural	36,480 (55.33%)	67.44
	Urban	29,452 (44.67%)	32.56
Socioeconomic status of household	Lowest income quintile	13,607 (20.64%)	30.04
	Second lowest income quintile	12,768 (19.37%)	21.77
	Third income quintile	13,825 (20.97%)	20.59
	Fourth income quintile	12,726 (19.30%)	15.59
	Highest fifth income quintile	13,006 (19.73%)	12.01
Drinking water	Safe water	64,376 (97.64%)	98.75
	Unsafe water	1556 (2.36%)	1.25
Household cooking fuel	Unclean fuels	35,044 (53.15%)	5.97
	Clean fuels	30,274 (45.92%)	38.78
	No cooking arrangement	614 (0.93%)	1.51
Drainage type	Open (kutchra and pucca)	27,670 (41.97%)	38.49
	Covered (pucca and underground)	18,764 (28.46%)	26.95
	No drainage	19,498 (29.57%)	34.56
Latrine type	Service and pit latrine	13,269 (20.13%)	17.16
	Septic tank/flush system	31,537 (47.83%)	40.76
	No latrine and others	21,126 (32.04%)	42.07
Household size	Small household (1-4 members)	29,055 (44.07%)	54.08
	Medium household (5-8 members)	31,461 (47.72%)	40.94
	Large household (9 and more)	5416 (8.21%)	4.98
Religion of the household	Hinduism	50,662 (76.84%)	82.35
	Islam	8987 (13.63%)	12.59
	Christianity	3924 (5.95%)	2.34
	Other religions	2359 (3.58%)	2.72
Social group of the household	Scheduled tribes	8382 (12.71%)	9.14
	Scheduled castes	11,058 (16.77%)	18.69
	Other backward classes	25,842 (39.19%)	43.26
	Others	20,650 (31.32%)	28.91
Level of care of hospitalization	If at least one member in the household used a private healthcare facility for hospitalization	24,060 (36.49%)	9.98

  

Variables	Definition	Mean	Standard error	95% Confidence interval
Sex	Proportion of female members in each household	0.4821	0.0018	0.4786-0.4857
Health Insurance coverage	Proportion of members enrolled in health insurance in each household	0.1684	0.0032	0.1620-0.1748
Chronic illness	Proportion of members suffering from chronic illness in each household	0.0637	0.0014	0.0608-0.0665
Hospitalization	Proportion members hospitalized in each household	0.0456	0.0006	0.0443-0.0468
Duration of hospitalization	Total duration of hospitalization of all members in each household	1.2972	0.02474	1.2487-1.3457
Duration of ailment	Total duration of ailment of all members in each household	395.2532	12.6161	370.5255-419.9809
Monthly consumption expenditure	Total consumption expenditure of all members in each household per month	37,233.3	304.3445	36,636.78-37,829.81
Monthly inpatient OOP health expenditure	Total inpatient OOP health expenditures of all members in each household per month	287.4692	11.57392	264.7844-310.1541
Monthly outpatient OOP health expenditure	Total outpatient OOP health expenditures of all members in each household per month	115.963	8.648854	99.0112-132.9147
Total monthly OOP health expenditure	Total OOP health expenditures of all members in each household per month	403.4322	14.48582	375.04-431.8244

among the households who experienced poverty due to OOP health expenditures. The normalized poverty gap indicates the

average amount of resources that fall short of the poverty line. The normalized poverty gap increased from 19.13% to 22.69%

Table 2: Incidence of poverty by demographic and household characteristics

Variables	Categories	Incidence of poverty in population (%)	Incidence of poverty among poor people (%)	Incidence of poverty after making OOP payments in population (%)	Incidence of poverty after making OOP payments among poor people (%)
Percentage of total households reporting poverty		16.44	100	19.05	100
Sector	Rural	19.65	80.57	22.61	80.03
	Urban	9.81	19.43	11.68	19.97
Socioeconomic status of household	Lowest income quintile	67.11	93.60	70.97	81.66
	Second lowest income quintile	5.06	6.39	11.68	12.18
	Third income quintile	0.00006	0.000076	3.16	0.0332
	Fourth income quintile	0	0	0.0175	0.0168
	Highest fifth income quintile	0	0	0.0142	0.0115
Household size	Small household	9.3	30.57	11.15	31.64
	Medium household	23.87	59.43	27.26	58.58
	Large household	33.02	10.00	37.40	9.78
Religion of the household	Hinduism	16.31	81.67	18.83	81.39
	Islam	18.23	13.96	21.67	14.32
	Christianity	14.44	2.06	16.50	2.03
	Other religions	13.98	2.31	15.86	2.27
Social group of the household	Scheduled tribes	31.61	17.57	33.25	15.96
	Scheduled castes	22.85	25.97	25.50	25.01
	Other backward classes	15.47	40.69	18.05	40.99
	Others	8.97	15.77	11.89	18.04
Duration of stay in hospital	Less than 5 days	16.66	94.11	18.15	88.47
	5-10 days	13.67	3.58	29.63	6.70
	11-20 days	13.54	1.57	32.64	3.26
	More than 20 days	13.42	0.74	32.65	1.56
Private healthcare facility for hospitalization	If at least one member in the household used a private healthcare facility	10.81	6.56	25.16	13.18
	No member in the household used a private healthcare facility	17.07	93.44	18.37	86.82
Child aged 5 years and less in the household	At least one child aged less than 5 years present in the household	23.36	46.88	27.06	46.88
	No child less than 5 years in the household	13.04	53.12	15.10	53.12
Elderly aged 60 years and above	At least one elderly person aged 60 years and above in the household	17.57	28.72	21.17	29.87
	No elderly aged 60 years and above in the household	16.03	71.28	18.27	70.13
Secondary educated female in household	At least one secondary educated female member in the household	9.45	19.51	12.09	21.54
	No secondary educated female member in the household	20.04	80.49	22.63	78.46
Divorced person in household	At least one divorced person in the household	17.78	24.26	20.87	24.59
	No divorced person in the household	16.06	75.74	18.52	75.41

after making OOP healthcare payments. In rural areas, there is increase in 3.54% increase in poverty gap after making OOP payments, whereas in the urban areas, there is a 3.64% increase in poverty gap. The post-payment gap increased across all the income quintiles and is highest for the richest income quintile. Households who have at least one member using a private healthcare facility for treatment have an average of 14.07% increase in poverty after making OOP healthcare payments. [Table 4] shows the results from the logistic regression model for predicting the effect of various factors on the incidence of impoverishment due to OOP health expenditures. People from medium and large households had lower odds of impoverishment

due to OOP health expenditures compared to smaller households. The likelihood of the incidence of impoverishment due to OOP health expenditures increased with the increase in duration of stay in the hospital, with the highest odds being for the households who had members who stayed for more than 20 days in a hospital. Also, utilization of private health facility, the presence of chronic illness among members and urban residence increased the odds of impoverishment.

## Discussion

We observed that the total poverty headcount in the population after making OOP payments was 19.05%, and among the

**Table 3: Intensity of poverty by demographic and household characteristics**

Variables	Categories	Pre-OOP payment poverty gap (%)	Post-OOP payment poverty gap (%)
Normalized poverty gap		19.13	22.69
Sector	Rural	18.96	22.50
	Urban	19.83	23.47
Socioeconomic status of household	Lowest expenditure quintile	20.04	22.82
	Second expenditure quintile	5.84	18.46
	Third expenditure quintile	1.03	30.08
	Fourth expenditure quintile	0	33.25
	Highest fifth expenditure quintile	0	39.25
Household size	Small household	16.87	21.41
	Medium household	19.68	22.74
	Large household	22.78	26.57
Religion of the household	Hinduism	19.31	22.81
	Islam	17.81	21.31
	Christianity	18.26	24.15
	Other religions	21.73	25.98
Social Group of the household	Scheduled tribes	23.46	24.90
	Scheduled castes	19.74	23.67
	Other backward classes	17.97	21.83
	Others	16.32	21.35
Duration of stay in hospital	Less than 5 days	19.12	21.25
	5-10 days	18.41	30.48
	11-20 days	20.31	36.89
	More than 20 days	21.51	41.55
Private healthcare facility for hospitalization	If at least one member in the household used a private healthcare facility	18.61	32.68
	No member in the household used a private healthcare facility	19.17	21.17
Child aged 5 years and less in the household	At least one child aged less than 5 years present in the household	19.64	23.05
	No child less than 5 years in the household	18.69	22.37
Elderly aged 60 years and above	At least one elderly person aged 60 years and above in the household	18.56	23.04
	No elderly aged 60 years and above in the household	19.37	22.53
Secondary educated female in household	At least one secondary educated female member in the household	17.31	22.51
	No secondary educated female member in the household	19.58	22.74
Divorced person in household	At least one divorced person in the household	19.76	23.38
	No divorced person in the household	18.39	22.47

households that were impoverished due to OOP health expenditures, the normalized poverty gap increased by 3.06% after making OOP payments. Our results are lesser than the World Bank estimates, which showed that 21.9% (2011) of the population were below the poverty line (2011) using the revised World Bank Poverty line of USD 1.90.<sup>[9]</sup> Our results showed that the poverty headcount increased from 16.44% and to 19.05% after making OOP payments. This 2.61% increase in the poverty headcount corresponds to 6.47 million households. A study by Peters *et al.*<sup>[15]</sup> (2002) using the NSS data for 1995–96 found that 2.2% of the population were impoverished due to OOP health expenditures. Our estimates are slightly higher than the study by Peter *et al.*<sup>[15]</sup> Another study by van Doorslaer *et al.*<sup>[17]</sup> showed that around 37 million people were pushed into poverty in 1999–2000 due to OOP payments alone. The average household size in India is 4.8–6.47 million households corresponding to around 31 million people falling below the poverty line. There are a number of health insurance programmes introduced between 2005 and 2010 by the Government of India which provided health insurance health coverage to the poor people.<sup>[12]</sup>

Our results show that the incidence of poverty has increased among the households belonging to different SES categories after making OOP payments. The logistic regression results showed that all the households belonging to all other expenditure quintiles have lower odds of incurring poverty compared to the poorest households. The odds became progressively lower with increasing socioeconomic status of the households, with the households in the richest expenditure quintile having the lowest probability of being impoverished due to OOP health expenditures. This finding is consistent with other studies available in the literature.<sup>[12,24,33-37]</sup>

Our study shows that the incidence of poverty in the population after making OOP payments has increased both in the urban and rural areas. However, in relative terms considering the poor people alone, the proportion of people becoming poor after making OOP payments has increased in the urban areas but has decreased in the rural areas to a small extent. This shows that people in the urban areas are faced with higher levels of OOP health expenditures which push them into poverty. The logistic



**Table 4: Logistic regression results for the incidence of impoverishment due to OOP health expenditures**

Incidence of poverty after making OOP payments	Odds ratio	95% Confidence interval	P
Presence of at least one child aged less than 5 years present in the household	0.6748	0.5663-0.8040	0.000
Presence of at least one elderly aged more than 60 years present in the household	1.0423	0.8499-1.2782	0.690
Presence of someone divorced in the household	1.1429	0.9386-1.3918	0.184
Sector			
Rural (reference)			
Urban	1.5910	1.3499-1.8752	0.000
Socioeconomic status			
Poorest income quintile (reference)			
Second lowest income quintile	0.1770	0.1316-0.2379	0.000
Third income quintile	0.0406	0.0293-0.0564	0.000
Fourth income quintile	0.0139	0.0092-0.0210	0.000
Highest fifth income quintile	0.0075	0.0042-0.0132	0.000
Household size			
Small household (Reference)			
Medium household (5-8)	0.6707	0.5556-0.8096	0.000
Large household (9 and more)	0.4136	0.3154-0.5423	0.000
Duration of hospitalization			
Less than 5 days (reference)			
5-10 days	2.3057	1.9797-2.6854	0.000
11-20 days	4.8588	4.0030-5.8970	0.000
More than 20 days	13.4902	10.2523-17.7506	0.000
At least one member in the household used a private healthcare facility	2.8742	2.3710-3.4841	0.000
Proportion of female members in each household	1.0935	0.6380-1.874	0.745
Proportion of members with chronic illness in each household	5.5827	3.3182-9.3927	0.000
At least one member is covered by insurance	0.6379	0.5152-0.7898	0.000
Constant	1.5215	0.7592-3.0491	0.237

regression results also show that the households in the urban areas having higher probability of impoverishment due to OOP health expenditures compared to rural areas. Evidence from literature have shown that there is a constant increase in urban poor population because of migration of poor people from the rural areas to the cities in search of employment opportunities and most of the poor people get settled in the crowded city slums with poor living conditions.<sup>[38]</sup> The latest Indian census shows that 33% of the Indian population lives in the urban areas, and by 2030, 250 million people will migrate to urban areas. Among this population, 27% of the urban population lives BPL.<sup>[39]</sup> This inflow of more people into the urban areas from the rural areas in search of employment opportunities may have biased our estimates. Although there is an urban advantage in the access to health services, but most of this advantage is not available to the poor people in the urban areas.<sup>[40]</sup> The GOI established the National Rural Health Mission in 2005 to address the health needs of the rural population; it was not until 2014, the government established the National Urban Health Mission to help the urban poor and strengthen the health infrastructure in the urban areas and reduce the OOP health expenditures.<sup>[41]</sup> This delay in establishing the urban health programme for the poor shows the lack of political will to cater to the health of the urban poor. Higher probability of impoverishment among the urban population shows that the National Urban Health Mission and other programmes that aimed at decreasing the OOP burden of the urban population are not well functioning. Also, most of the urban poor work on daily wages could not get admitted in the hospitals which may affect their ability to

go to work. But the current health insurance programmes for the poor only cover for hospitalization and none of the health insurance programmes that are currently available provide coverage for outpatient services. For this reason of not wanting to lose work and lack of coverage for outpatient services by the current health insurance programmes for the poor, they may be forced to pay OOP for outpatient services, increasing their financial burden. Also, households with a greater number of members have a lower probability of impoverishment due to OOP health expenditures compared to smaller households. One of the probable reasons may be that larger households can arrange someone within the family to act as a caregiver in the case of illness or disability. This family caregiving may also prevent hospitalization for many common conditions. Evidence from the United States have shown that home health provision has reduced both the number of visits and duration of stay in the hospital.<sup>[42]</sup>

Chronic illness is found to be an important determinant of impoverishment due to OOP payments. Studies have shown that chronic diseases are also important determinants of hospitalizations.<sup>[43]</sup> In our study, households having at least one member with chronic illness had more than two times higher odds of impoverishment compared to households with members without chronic illnesses. Studies done in Bangalore, India<sup>[44]</sup> and China<sup>[45]</sup> show a similar result that chronic diseases are important determinants for pushing households into poverty; place where people get hospitalized, whether a government or private healthcare facility impacts the health expenditures. India also has a

wide network of unregulated private sector hospitals with around 49% of total available beds being in the private sector.<sup>[46]</sup> Our study showed that the place where people get hospitalized also determines whether they will be pushed into poverty due to OOP payments. Getting hospitalized in a private hospital increased the proportion of households being impoverished after making OOP payments from 1.3% if no member used a private hospital for hospitalization to 14.35% if at least one member in the household used a private healthcare facility. Our logistic regression supports this finding by showing around two times higher odds of OOP impoverishment of using a private healthcare facility. Also, the intensity of poverty greatly increased if a private health facility is used with the poverty gap increasing from 2% to 14.07% if a private healthcare facility was used by a member. Evidence from Thailand shows that inpatient admission in private sector hospitals was an important reason for impoverishment.<sup>[47,48]</sup> Even among the poor households, there was a 6.62% increase in the incidence of poverty of using a private healthcare facility. This shows that the current health insurance programmes for the poor which cover the poor households are not completely effective. Also, the quality of healthcare in government hospitals is very poor in India and poor people also go to private providers for treatment even if they could visit a government health centre at a much cheaper price.<sup>[15]</sup>

## Conclusions

This focus by the Government of India on child health by establishing several national health programmes reduces the probability of incurring high OOP health expenditures and thus protects the households from falling into poverty due to high OOP health expenditures. Our study showed that the probability of experiencing poverty due to OOP health expenditures significantly decreased if at least one member of the household is covered by health insurance. Health insurance coverage is thus found to be protective against OOP spending and pushing the households into poverty. This finding is supported by studies done in Andhra Pradesh,<sup>[49,50]</sup> Karnataka,<sup>[51]</sup> which showed that coverage under health insurance coverage reduced OOP health expenditures. However, other studies in Andhra Pradesh<sup>[52]</sup> showed that households with health insurance coverage had higher OOP health expenditures. Even the evidence found internationally on the effect of health insurance on OOP health expenditures is also mixed with studies from Indonesia, and Laos showing that health insurance programmes reduced OOP health expenditures,<sup>[53,54]</sup> but evidence from Vietnam showed that the health insurance programme had no effect on OOP health expenditures.<sup>[55]</sup> But our study supports the protective effect of health insurance from impoverishment due to OOP health expenditures. In conclusion, identifying the households who experience poverty due to OOP payments is vital to frame adequate health policies to provide adequate financial risk protection.

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## Conflicts of interest

There are no conflicts of interest.

## References

1. Karlberg I. Getting health reform right: A guide to improving performance and equity. *Int J Integr Care* 2004;4:e07.
2. Reinhardt U, Cheng T. The world health report 2000 – Health systems: Improving performance. *Bull World Health Organ* 2000;78:1064.
3. Baeza C, Packard TG. Beyond Survival: Protecting Households from Health Shocks in Latin America, World Bank, Washington DC; 2006.
4. NHA. National Health Accounts: Estimates for India 2014-15. Ministry of Health and Family Welfare. Government of India; 2017.
5. Russell S. The economic burden of illness for households in developing countries: A review of studies focusing on malaria, tuberculosis and human immunodeficiency virus/acquired immunodeficiency syndrome. *Am J Trop Med Hyg* 2004;71:147-55.
6. Saksena P, Hsu J, Evans DB. Financial risk protection and universal health coverage: Evidence and measurement challenges. *PLoS Med* 2014;11:e1001701.
7. GOI. National Health Policy 2017. Ministry of Health and Family Welfare, Government of India; 2017.
8. Krishna A. Escaping poverty and becoming poor in three states of India, with additional evidence from Kenya, Uganda, and Peru. In: Narayan D, Petesch P, editors. *Moving out of Poverty: Cross-Disciplinary Perspectives on Mobility*. Vol 1. Palgrave Macmillan and World Bank; 2007. p. 165-97.
9. World Bank. Poverty and Equity Data Portal. World Bank; 2019.
10. Hooda SK. Out-of-pocket payments for healthcare in India: Who have affected the most and why? *J Health Manag* 2017;19:1-15.
11. Garg CC, Karan AK. Reducing out-of-pocket expenditures to reduce poverty: A disaggregated analysis at rural-urban and state level in India. *Health Policy Plan* 2009;24:116-28.
12. Berman P, Ahuja R, Bhandari L. The impoverishing effect of healthcare payments in India: New methodology and findings. *Econ Polit Wkly* 2010;45:65-71.
13. Selvaraj S, Karan A. Deepening health insecurity in india: Evidence from national sample surveys since 1980s. *Econ Polit Wkly* 2009;44:55-60.
14. Lhungdim H, Roy TK, Guruswamy M, Arokiasamy P. Health System Performance Assessment, World Health Survey-2003, West Bengal Report. 2006.
15. Peters DH, Yazbeck AS, Sharma RR, Ramana GNV, Pritchett LH, Wagstaff A. Better health systems for India's poor: Findings, analysis and options. Human Development Network, Health, Nutrition and Population Series. Washington DC: The World Bank; 2002.
16. Balarajan Y, Selvaraj S, Subramanian SV. Health care and equity in India. *Lancet* 2011;377:505-15.
17. van Doorslaer E, O'Donnell O, Rannan-Eliya RP, Somanathan A, Adhikari SR, Garg CC, *et al.* Effect of payments for health care on poverty estimates in 11 countries in Asia: An analysis of household survey data. *Lancet* 2006;368:1357-64.
18. McHenga M, Chirwa GC, Chiwaula LS. Impoverishing effects

- of catastrophic health expenditures in Malawi. *Int J Equity Health* 2017;16:25.
19. Braveman P, Gruskin S. Poverty, equity, human rights and health. *Bull World Health Organ* 2003;81:539-45.
  20. van Doorslaer E, Masseria C, Koolman X, Group OHER. Inequalities in access to medical care by income in developed countries. *Can Med Assoc J* 2006;174:177-83.
  21. Leive A, Xu K. Coping with out-of-pocket health payments: Empirical evidence from 15 African countries. *Bull World Health Organ* 2008;86:849-56.
  22. Shahrawat R, Rao KD. Insured yet vulnerable: Out-of-pocket payments and India's poor. *Health Policy Plan* 2012;27:213-21.
  23. Wagstaff A. Measuring financial protection in health. In: Smith PC, Mossialos E, Papanicolas I, Leatherman S, editors. *Performance Measurement for Health System Improvement: Experiences, Challenges and Prospects*. Cambridge: Cambridge University Press; 2009.
  24. Wagstaff A, van Doorslaer E. Catastrophe and impoverishment in paying for health care: With applications to Vietnam 1993-1998. *Health Econ* 2003;12:921-34.
  25. Sriram S. Are the subcenters adequately equipped to deliver primary healthcare? A study of public health manpower and infrastructure in the health district in Andhra Pradesh, India. *J Family Med Prim Care* 2019;8:102-8.
  26. Sriram S, Noochpoung R. Determinants of hospital waiting time for outpatient care in India: How demographic characteristics, hospital ownership, and ambulance arrival affect waiting time. *Int J Community Med Public Health* 2018;5:2692-8.
  27. Sriram S. Availability of infrastructure and manpower for primary health centers in a district in Andhra Pradesh, India. *J Family Med Prim Care* 2018;7:1256-62.
  28. Xu K, Evans DB, Kawabata K, Zeramdini R, Klavus J, Murray CJ. Household catastrophic health expenditure: A multicountry analysis. *Lancet* 2003;362:111-7.
  29. O'Donnell O, van Doorslaer E, Rannan-Eliya RP, Somanathan A, Adhikari SR, Harbianto D, *et al*. The incidence of public spending on healthcare: Comparative evidence from Asia. *World Bank Econ Rev* 2007;21:93-123.
  30. NSSO. *Key Indicators of Social Consumption in India Health National Sample Survey Organization*; 2014.
  31. Andersen R. Revisiting the behavioral model and access to medical care: Does it matter? *J Health Soc Behav* 1995;36:1-10.
  32. Planning Commission. *Report of the Expert Group to Review the Methodology for Measurement of Poverty*. New Delhi: Planning Commission; 2014.
  33. Kumar AK, Chen LC, Choudhury M, Ganju S, Mahajan V, Sinha A, Sen A. Financing health care for all: Challenges and opportunities. *Lancet* 2011;377:668-79.
  34. Sriram S, Khan MM. Effect of health insurance program for the poor on out-of-pocket inpatient care cost in India: Evidence from a nationally representative cross-sectional survey. *BMC Health Serv Res* 2020;20:839.
  35. Kawabata K, Xu K, Carrin G. Preventing impoverishment through protection against catastrophic health expenditure. *Bull World Health Organ* 2002;80:612.
  36. Alam K, Mahal A. Economic impacts of health shocks on households in low and middle income countries: A review of the literature. *Global Health* 2014;10:21.
  37. Pal R. Measuring incidence of catastrophic out-of-pocket health expenditure: With application to India. *Int J Health Care Finance Econ* 2012;12:63-85.
  38. Sriram S. Critical evaluation of two approaches to achieve universal health coverage in India. *Int J Community Med Public Health* 2018;5:3159-63.
  39. Ebrahim S, Kinra S, Bowen L, Andersen E, Ben-Shlomo Y, Lyngdoh T, *et al*. The effect of rural-to-urban migration on obesity and diabetes in India: A cross-sectional study. *PLoS Med* 2010;7:e1000268.
  40. GOI. *Report of House Listing and House Census: Census of India*. Government of India; 2011.
  41. Rice J, Rice JS. The concentration of disadvantage and the rise of an urban penalty: Urban slum prevalence and the social production of health inequalities in the developing countries. *Int J Health Serv* 2009;39:749-70.
  42. Bhat R, Holtz J, Avila C. Reaching the missing middle: Ensuring health coverage for India's urban poor. *Health Syst Reform* 2018;4:125-35.
  43. O'Connor M, Hanlon A, Naylor MD, Bowles KH. The impact of home health length of stay and number of skilled nursing visits on hospitalization among Medicare-reimbursed skilled home health beneficiaries. *Res Nurs Health* 2015;38:257-67.
  44. Dantas I, Santana R, Sarmiento J, Aguiar P. The impact of multiple chronic diseases on hospitalizations for ambulatory care sensitive conditions. *BMC Health Serv Res* 2016;16:348.
  45. Bhojani U, Thriveni BS, Devadasan R, Munegowda CM, Devadasan N, Kolsteren P, *et al*. Out-of-pocket healthcare payments on chronic conditions impoverish urban poor in Bangalore, India. *BMC Public Health* 2012;12:990.
  46. Lan X, Zhou Z, Si Y, Shen C, Fan X, Chen G, *et al*. Assessing the effects of the percentage of chronic disease in households on health payment-induced poverty in Shaanxi Province, China. *BMC Health Serv Res* 2018;18:871.
  47. Thadani KB. Public Private partnership in the health sector: Boon or bane. *Proce Soc Behav Sci* 2014;157:307-16.
  48. Limwattananon S, Tangcharoensathien V, Prakongsai P. Catastrophic and poverty impacts of health payments: Results from national household surveys in Thailand. *Bull World Health Organ* 2007;85:600-6.
  49. Rout SK, Mahapatra S. Has the public health system provided adequate financial risk protection for child birth conditions-evidences from an eastern Indian State. *Int J Health Policy Manag* 2018;8:145-9.
  50. Fan VY, Karan A, Mahal A. State health insurance and out-of-pocket health expenditures in Andhra Pradesh, India. *Int J Health Care Finance Econ* 2012;12:189-215.
  51. Rao M, Katyal A, Singh PV, Samarth A, Bergkvist S, Kancharla M, *et al*. Changes in addressing inequalities in access to hospital care in Andhra Pradesh and Maharashtra states of India: A difference-in-differences study using repeated cross-sectional surveys. *BMJ Open* 2014;4:e004471.
  52. Sood N, Bendavid E, Mukherji A, Wagner Z, Nagpal S, Mullen P. Government health insurance for people below poverty line in India: Quasi-experimental evaluation of insurance and health outcomes. *BMJ* 2014;349:g5114.
  53. Mitchell A, Mahal A, Bossert T. Healthcare utilisation in rural Andhra Pradesh. *Econ Polit Wkly* 2011;46:15-9.
  54. Aji B, De Allegri M, Souares A, Sauer Born R. The impact of health insurance programs on out-of-pocket expenditures



- in Indonesia: An increase or a decrease? *Int J Environ Res Public Health* 2013;10:2995-3013.
55. Alkenbrack S, Lindelow M. The impact of community-based health insurance on utilization and out-of-pocket expenditures in Lao People's Democratic Republic. *Health Econ* 2015;24:379-99.