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Comparable estimates of out-of-pocket payment on hospitalisation and outpatient services in India, 2004-18

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ABSTRACT

Background: Comparable estimates of household health spending and out-of-pocket (OOP) payment on health care in India are a daunting task. Often these estimates are provided for specific services such as maternal care, type of disease, hospitalisation, outpatient care, and an episode of hospitalisation. This paper presents comprehensive and comparable estimates of health spending and out-of-pocket payment on hospitalisation and outpatient care in India over the past 15 years.

Methods: A total of 73,868 households in 2004, 65,932 households in 2014, and 113,823 households in 2018 surveyed in the 60th, 71st, and 75th rounds of NSSO health surveys, respectively, were used in the analysis. Descriptive statistics, concentration index, two-part regression, and logistic regression were used in the analysis.

Results: The utilisation of hospitalisation services has increased over time. During 2004–18, the mean adjusted OOP payment on hospitalisation at 2018 prices was 308 US$ in 2004,353 US$ in 2014 and 332 US$ by 2018. Reimbursement on medical spending was only 2%, 7% and 11% of medical spending in 2004, 2014 and 2018 respectively. Both medical spending and OOP on inpatient and outpatient care showed large inter-state variations. The OOP payment on inpatient and outpatient care was significantly higher among richer households in urban households, households without health insurance, households having an elderly member and female-headed households.

Conclusion: Though the households OOP for outpatient and inpatient, in recent years had declined, OOP as a share of medical expenditure remained high over time and majority of the households are not yet covered under any health protection scheme in India.

1. Introduction

Rising healthcare expenditure is a global, national and regional trend. Globally, health spending accounted for 9.92% of GDP in 2014.[1] The variation and growth in per capita health spending are larger than that of per capita income among countries.[2] The annual per capita spending on healthcare is projected to grow by over 4% in middle-income countries and 2% in low-income countries in the next two decades.[3] Though the per capita health spending is associated with the level of economic development, the growth and pattern of health spending was distinct across countries.[4] Healthcare expenditure in high-income countries is largely financed by the government (WHO, 2019),[1] while households remains the major sources of finance for healthcare in low- and middle-income countries.

The health financing transition provides a theoretical and conceptual framework to understand the changing pattern of health spending. It stipulated that along with development, there will be an increase in share of public spending resulting a shift from low per capita healthcare spending to a high per capita health spending. It would lead to shift from high out-of-pocket (OOP) payment to low OOP payment.[5] The WHO Health Financing Strategy for the Asia Pacific Region 2010–2015, recommended that the OOP should not exceed 30–40% of the total expenditure.

The demographic and epidemiological transition in India altered the disease burden in the country, but the pattern of health spending

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[1] See for details WHO (2019). Global Spending on Health: A World in Transition, Global Report. https://www.who.int/health_financing/documents/health-expenditure-report-2019.pdf.

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Abbreviations

OOP	Out-of-pocket payment
AL:	Agricultural Labour
IW	Industrial Worker
CPI	Consumer Price Index
MPCE	Monthly Per Capita Expenditure
GDP	Gross Domestic Product
NHP	National Health Policy
NSS	National Sample Survey
CHS	Catastrophic Health Spending
SDG	Sustainable Development Goal

Table 1
Number of episodes, individuals and households by selected characteristics in the health survey, India, 2004-18.

Variables	2004	2014	2018
Percentage of households with any hospitalisation[a]	43.1	72.7	73.2
Percentage of households with only outpatient care	36.3	38.4	27.5
The median age of hospitalisation	37.0	36.2	35.3
Mean household size	4.8	4.5	4.4
Monthly Per capita Consumption Expenditure (mean) at 2018 prices (in US$)	26	34	38
Number of hospitalized episodes (without maternal care)	32,665	57,456	93,924
Number of households spent on maternal care	10,937	16,862	28,163
Number of outpatient spells	31,106	33,911	39,901
Number of households with at least one-member availed outpatient care	26,970	25,286	31,303
Number of households surveyed	73,868	65,932	1,13,823

[a] Hospitalisation includes maternal care.
Source: Authors own computation based on, Survey on Morbidity and Health Care: NSS 60th Round (January 2004–June 2005), Social Consumption - Health Survey: NSS 71st Round (June 2014) and Key Indicators of Social Consumption in India: Health, NSS 75th Round (July 2017–June 2018). 1US$ = 65.11 INR

remained unchanged. Non-communicable diseases have become the leading cause of death, hospitalisation and disability.[6–9] The changing disease burden largely affects working adults and the elderly, driving households into medical poverty.[10] The per capita public health spending in India was lower compared to many lower-middle-income countries.[2] Despite increasing political commitment, public spending and increasing coverage of health insurance, the pattern of health spending in India remained unchanged over time. About 71% of health spending in 2004 and 69.1% in 2014 was met by households.[11,12] The reasons for rising health spending are many; changing disease patterns, changing age-structure, use of improved technology, rising health insurance, insufficient public spending, etc. The high OOP and rising health spending are disproportionately high and catastrophic to the poor, elderly and marginalised population.[13] About 4–5% of the households accounting 33 million people were impoverished due to medical expenditure.[14] The high OOP spending and catastrophic health spending (CHS) was acknowledged in central and state government policy documents.[15] One of the effective ways of reducing OOP spending is by increasing public spending on health. The public health spending remained low; at 1.3% of the GDP in last decade and has increased to 1.4% of GDP in 2016–17.[16] The share of private health spending was 3.9% of the total GDP in India.[15] The National Health Policy (NHP) has stipulated increasing the central government spending to 2.5% of GDP by 2025.[15]

Table 2
Estimated out-of-pocket payment on each episode of hospitalisation and outpatient care (in US$) of households in India, 2004–18 at 2018 prices.

Variables	Mean			Median		
	2004	2014	2018	2004	2014	2018
Medical Expenditure on hospitalisation in 365 days reference period at constant prices (2018)	245	396	325	63	143	103
Medical Expenditure on outpatient visit in 15 days reference period at constant prices (2018)	12	15	14	5	6	6
Medical expenditure on hospitalisation and outpatient visit in 30 days reference period	30	37	32	11	15	12
OOP of household on hospitalisation in 365 days reference period at current prices	91	317	301	24	117	98
OOP payment of household on hospitalisation in 365 days reference period at constant prices (2018)	235	377	301	61	137	98
OOP payment of households on out-patient visit in 15 days reference period at current prices	5	13	14	2	5	6
OOP payment of households on out-patient visit in 15 days reference period at constant prices (2018)	12	15	14	5	6	6
OOP payment of household on hospitalisation and outpatient care in 30 days at constant prices (2018)	29	37	31	11	14	12
Reimbursement on medical care at current prices	2	7	11	0	0	0

Source: Authors own computation based on, Survey on Morbidity and Health Care: NSS 60th Round (January 2004–June 2005), Social Consumption - Health Survey: NSS 71st Round (June 2014) and Key Indicators of Social Consumption in India: Health, NSS 75th Round (July 2017–June 2018). 1US$ = 65.11 INR

1.1. Need for the study

Reliable estimates of health spending and OOP payment on health care are increasingly sought by national and state governments, developmental partners, and international organisation. Reduction in OOP payment is a measure of financial protection and one of the key monitoring indicators of SDGs. While estimates of OOP and medical expenditure are available from varying sources in India, they suffer from data and methodological limitations and temporal comparison. This paper provides comparable estimates of medical expenditure and OOP payment on inpatient and outpatient services in India.

2. Data and methods

2.1. Data

We used the data from National Sample Survey Organisation (NSSO), the NSS health surveys provided expenditure on health for each episode of hospitalisation, the spell of outpatient visits and expenditure on maternal care for members of households located at different levels. In case of hospitalisation, the 60th round of survey (schedule 25) did not provide expenditure on maternal care as a part of hospitalisation but included it in the maternal care section while the 71st (25) and 75th (25) rounds provided expenditure on delivery care as a part of hospitalisation. Data was used primarily from these three rounds of health surveys, namely, schedule 25.0 of the 60th round held in 2004–05, 71st round held in 2014 and 75th round held in 2017–18. Data from inpatient

Table 3
Out-of-pocket (OOP) payment on inpatient and outpatient care (in US$) of households at 2018 prices in states of India, 2004-18.

States	Inpatient and outpatient care (30 days)			Inpatient care (365 days)			Outpatient care (15 days)		
	2004	**2014**	**2018**	**2004**	**2014**	**2018**	**2004**	**2014**	**2018**
Andaman & Nicobar	12	24	27	127	162	424	4	11	7
Andhra Pradesh	25	35	29	220	472	342	10	12	12
Arunachal Pradesh	37	36	28	117	126	91	23	20	22
Assam	21	29	22	102	224	167	10	16	12
Bihar	20	31	19	106	230	152	9	15	10
Chandigarh	31	34	64	351	504	564	9	14	32
Chhattisgarh	24	33	21	162	236	292	11	18	7
Dadra & Nagar Haveli	17	17	12	178	151	81	4	7	6
Daman & Diu	19	23	24	165	306	302	8	9	10
Delhi	7	37	32	73	449	345	2	14	16
Goa	17	41	30	235	486	310	6	17	10
Gujarat	29	29	23	248	340	261	11	10	10
Haryana	39	44	33	356	478	345	14	18	14
Himachal Pradesh	35	38	39	287	410	369	15	15	18
Jammu & Kashmir	27	38	17	136	206	160	13	21	8
Jharkhand	18	24	27	87	179	211	8	12	14
Karnataka	30	39	28	238	414	283	13	15	12
Kerala	35	48	45	313	575	475	13	14	16
Lakshadweep	40	30	27	589	473	323	7	8	9
Madhya Pradesh	25	31	27	185	256	196	10	15	15
Maharashtra	34	44	32	305	496	371	14	16	12
Manipur	21	31	27	127	203	237	8	21	16
Meghalaya	10	11	8	69	104	81	4	5	3
Mizoram	12	16	17	103	106	100	6	11	12
Nagaland	17	15	15	75	148	131	8	7	8
Odisha	20	31	23	156	262	226	9	14	11
Pondicherry	27	38	28	229	340	322	11	16	12
Punjab	41	48	35	513	595	479	14	19	13
Rajasthan	39	34	33	277	277	261	17	16	18
Sikkim	17	15	18	112	195	150	8	5	11
Tamil Nadu	28	35	30	315	481	324	10	12	13
Telangana	40	45	33	328	458	413	16	19	12
Tripura	24	43	30	198	189	151	12	35	28
Uttar Pradesh	31	41	36	195	385	328	14	18	16
Uttarakhand	31	31	24	197	227	268	13	16	10
West Bengal	25	31	31	196	323	281	11	13	14
India	**29**	**37**	**31**	**235**	**377**	**301**	**12**	**15**	**14**

Source: Authors own computation based on, Survey on Morbidity and Health Care: NSS 60th Round (January 2004–June 2005), Social Consumption - Health Survey: NSS 71st Round (June 2014) and Key Indicators of Social Consumption in India: Health, NSS 75th Round (July 2017–June 2018). Estimate are for households who availed the health services. 1US$ = 65.11 INR.

care (synonymous with hospitalisation) and outpatient care was aggregated at the household level while deriving the total health expenditure, reimbursement and OOP payment of a household. Antenatal, natal, postnatal care and immunisation were spread over a year and included in inpatient care. Estimates of inpatient care were available for each episode of hospitalisation in a 365-day reference period while that of outpatient care was available for a 15-day reference period uniformly in all three rounds of the survey. The health schedule of 2014 and 2018 are similar while that of 2004 is comparable. The details of the findings from the survey are available in national reports.[17–20] We present a comparable estimate of health expenditure to facilitate international comparison and for ease of international readers. Estimates are presented in US$ and the exchange rate of $1 = 65.11 Indian Rupees is used. The exchange rate is the average of the monthly exchange rate between July 2017 and June 2018 during which the NSSO 75th round survey was conducted.

2.2. Methods

2.2.1. Medical expenditure

Medical expenditure is defined as the total expenditure on medicine, diagnostic test, bed charges, physicians' fees, transportation and other expenses. The estimates were provided for each episode of hospitalisation in a reference period of 365 days and that of outpatient care in a reference period of 15 days.

2.2.2. Out-of-pocket payment

Out-of-pocket payment is defined as total medical expenditure less of reimbursement. The OOP was provided for inpatient care for a reference period of 365 days and outpatient care for a reference of 15 days.

2.2.3. Consumer price index

We have consumer price index (CPI) that takes into account state-specific price indices of agricultural labour (AL)[2] for rural areas and industrial worker (IW) for urban areas to convert nominal prices to real prices. In the present study CPI-AL and CPI-IW were used to convert the health expenditure variables of the nominal price of 2004 and 2014 at the 2018 prices. The base year (2001–02 = 100) was taken uniformly for rural and urban areas.

2.2.4. Two-part regression model

The two-part regression model was used to estimate the predicted OOP across states over time. In the two-part model, first a logit model was estimated followed by ordinary linear regression. The predicted OOP was estimated following OLS estimation.[21] The estimates of OOP payment and medical expenditure were adjusted for independent variables.

[2] *Source: Labour Bureau, Ministry of Labour and Employment, Government of India. Published in Reserve Bank of India Bulletin.*

Table 4
Variations in OOP payment on inpatient and outpatient care (in US$) based on selected socio-economic and demographic characteristics of households in India, 2004-18.

Variables	OOP on inpatient and outpatient care in 30 days			OOP on inpatient care in 365 days			OOP on outpatient care in 15 days		
	2004	2014	2018	2004	2014	2018	2004	2014	2018
MPCE Quintile									
Poorest	20	28	23	125	216	195	8	13	11
Poorer	23	32	29	168	281	259	10	14	13
Middle/Secondary	27	33	32	217	316	303	11	13	14
Richer	35	42	33	274	406	330	14	17	14
Richest	49	61	43	433	701	451	19	21	17
Place of residence									
Rural	27	32	27	209	313	256	11	13	12
Urban	34	46	38	298	517	395	13	18	16
Covered by any health insurance schemes									
No insurance coverage	29	37	30	231	377	295	12	15	14
Any Insurance coverage	48	36	32	393	379	322	19	14	13
Age of head of household									
Lt 30	19	22	19	119	200	168	8	10	9
30–44	26	32	26	203	349	247	11	13	12
45–59	32	37	31	264	383	312	13	15	14
60+	38	48	42	353	517	459	15	18	17
Sex of the head of household									
Male	30	37	31	233	375	297	12	15	14
Female	28	33	29	259	394	340	11	13	12
Educational Attainment of the head of household									
No education	23	29	25	160	270	234	10	13	11
up to Primary	27	33	28	221	350	276	11	13	12
Middle/Secondary	35	40	31	273	400	307	14	16	14
higher secondary	45	51	42	408	608	424	17	19	19
Type of employment of household									
Labour	21	26	23	146	233	198	9	12	11
Self Employed	35	43	36	301	462	356	14	17	15
Wage/salary	30	38	32	248	399	311	12	15	14
Others	42	43	38	380	538	502	17	16	15
Any elderly member in the household									
No	26	31	26	194	319	249	11	13	12
Yes	37	47	40	338	496	434	15	18	16
Religion of household									
Hindu	29	35	30	228	378	301	12	14	14
Muslim	29	38	29	212	330	262	12	16	13
Christian	40	47	38	374	403	384	15	19	15
Sikh	39	57	36	482	690	464	14	21	15
Others	30	40	39	243	417	345	12	15	18
Total	**29**	**37**	**31**	**235**	**377**	**301**	**12**	**15**	**14**

Source: Authors own computation based on, Survey on Morbidity and Health Care: NSS 60th Round (January 2004–June 2005), Social Consumption - Health Survey: NSS 71st Round (June 2014) and Key Indicators of Social Consumption in India: Health, NSS 75th Round (July 2017–June 2018). 1US$ = 65.11 INR

3. Results

3.1. Sample characteristics

Table 1 presents the number of households surveyed, the percentage of households that availed of hospitalisation services, outpatient care and sample characteristics of individuals and households availing of health services in 2004, 2014 and 2018. A total of 73,868 households were surveyed in 2004, 65,932 in 2014 and 113, 823 in 2018. Of the total households surveyed, 43% availed of hospitalisation services in 2004 and 73% each in 2014 and 2018. The median age of hospitalisation declined by two years over time. MPCE increased by 45% in the past 15 years.

3.2. Medical expenditure and OOP payment on hospitalisation and outpatient care

Table 2 presents the estimated mean and median of medical expenditure and OOP payment on inpatient and outpatient care of households at current and constant prices. The mean OOP payment on inpatient care of households was US$235 in 2004 and increased to US$301 by 2018 and the mean OOP payment on outpatient care was US$12 in 2004 and increased to US$14 by 2018. The mean medical expenditure and OOP payment of households on hospitalisation at a constant price increased by 33% and 28% respectively in last 15 years. The OOP payment on outpatient care has increased by 17% during 2004–18. The mean OOP payment of a household in a 30 day reference period on health care was US$29 in 2004 and US$31 in 2018. Reimbursement at constant price has increased more than twice during this period. However, the median value of reimbursement was 0 over time, thereby suggesting that a majority of the population did not get any reimbursement.

3.3. State variation in medical expenditure and OOP payment on inpatient and outpatient care

Appendix 1 presents the state pattern in mean medical expenditure on inpatient and outpatient care of households at 2018 prices. Variations in medical expenditure among states for inpatient and outpatient care were considerable over time. In 2004, for inpatient care, the medical expenditure was lowest in Meghalaya followed by Delhi and highest in Lakshadweep followed by Punjab. By 2018, it was highest in Chandigarh followed by Kerala, and lowest in Dadra & Nagar Haveli followed by Arunachal Pradesh. In 2004, for outpatient care, the medical expenditure was highest in Arunachal Pradesh followed by Rajasthan and lowest in Delhi followed by Dadra & Nagar Haveli. By 2018, it was highest in Chandigarh followed by Tripura and lowest in Meghalaya followed by

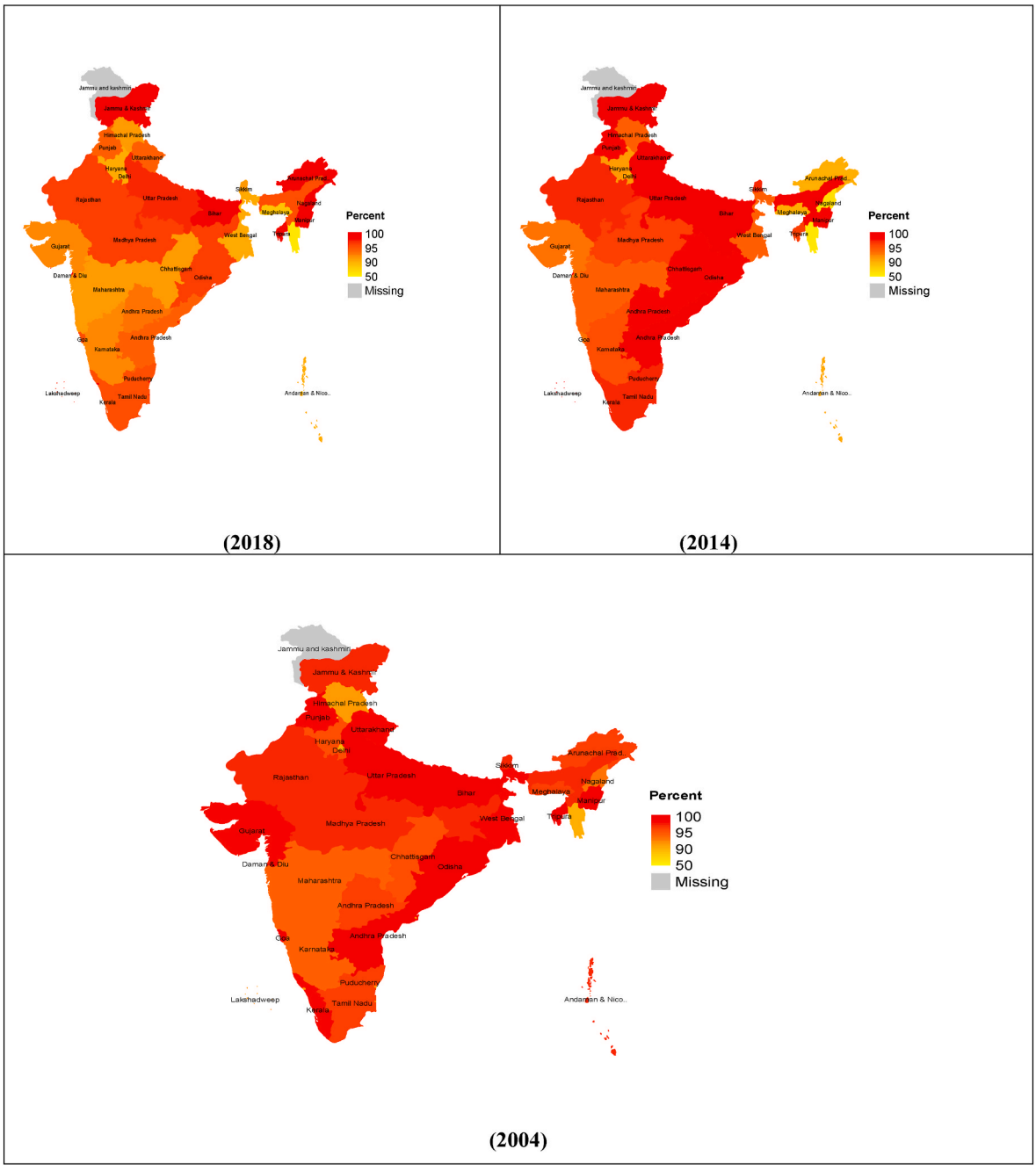

Fig. 1. OOP payment as a percentage of medical expenditure in states of India, 2004-18.

Dadra & Nagar Haveli. In 2004, for both inpatient and outpatient care, the medical expenditure was highest in Punjab followed by Lakshadweep and lowest in Delhi followed by Meghalaya by 2018.

Table 3 presents the mean OOP payment on inpatient and outpatient care at 2018 prices in states of India. The state variations in OOP payment for inpatient and outpatient care were large over time. In 2004, for inpatient care, the OOP payment was lowest in Meghalaya followed by Delhi and highest in Lakshadweep followed by Punjab. The mean OOP payment of households in Punjab was over seven times higher that of Delhi. By 2018, it was highest in Chandigarh followed by Punjab and lowest in Meghalaya followed by Dadra & Nagar Haveli. Similarly, in 2004, the mean OOP payment on outpatient care was lowest in Delhi, followed by Dadra & Nagar Haveli and highest in Arunachal Pradesh followed by Rajasthan. In 2018, it was lowest in Meghalaya followed by Dadra & Nagar Haveli and highest in Chandigarh followed by Tripura.

3.4. Variations in OOP payment on inpatient and outpatient care

Table 4 presents the variations in OOP payment on inpatient and outpatient care based upon socio-economic and demographic characteristics over time. It was the lowest among the poorest, followed by poorer and highest among the richest over time. The OOP payment for both inpatient and outpatient care increased for each quintile during 2004–18. The OOP payment on inpatient and outpatient care in 30 days was higher in urban than in rural areas throughout the period. Male-headed households had higher OOP payment compared to female-headed households over time. Similarly, households with no education had lower OOP payment on inpatient and outpatient care. OOP payment was higher in households with self-employed members and lower in households having members with regular wage and salary for both inpatient and outpatient care. Households with elderly members had

Table 5
Regression results of out-of-pocket payment on inpatient and outpatient care of households from a two-part model, 2018.

Variables	Inpatient and Outpatient Care in 30 days		Inpatient Care in 365 days		Outpatient Care in 15 days	
	β (OLS)	95% CI	β (OLS)	95% CI	β (OLS)	95% CI
MPCE Quintile						
Poorest®						
Poorer	0.178**	[0.119–0.238]	0.258**	[0.193–0.323]	0.060	[0.193–0.323]
Middle	0.321**	[0.261–0.382]	0.438**	[0.373–0.503]	0.150**	[0.373–0.503]
Richer	0.493**	[0.434–0.552]	0.607**	[0.541–0.674]	0.314**	[0.541–0.674]
Richest	0.775**	[0.713–0.837]	0.978**	[0.911–1.045]	0.493**	[0.911–1.045]
Place of residence						
Rural®						
Urban	0.250**	[0.209–0.291]	0.326**	[0.281–0.371]	0.158**	[0.281–0.371]
Household Size						
1-4®						
5–7	0.201**	[0160–0.243]	0.137**	[0.090–0.185]	0.258**	[0.090–0.185]
8+	0.349**	[0.292–0.406]	0.284**	[0.220–0.348]	0.467**	[0.220–0.348]
Covered by any health insurance schemes						
No insurance coverage®						
Any Insurance coverage	−0.059**	[-0.102,-0.016]	−0.012	[-0.058–0.035]	−0.108**	[-0.058–0.035]
Any elderly member in the household						
No®						
Yes	0.345**	[0.286–0.404]	0.333**	[0.269–0.396]	0.116**	[0.269–0.396]
Type of employment of household						
Labour®						
Wage/salary	0.052**	[0.002–0.101]	0.104**	[0.047–0.160]	0.020	[0.047–0.160]
Self Employed	0.008	[-0.046–0.062]	0.039	[-0.023–0.101]	0.001	[-0.023–0.101]
Others	0.044	[-0.014–0.102]	0.090**	[0.025–0.155]	0.044	[0.025–0.155]
Age of head of household						
Lt 30®						
30–44	0.301**	[0.238–0.363]	0.303**	[0.235–0.370]	0.035	[0.235–0.370]
45–59	0.462**	[0.400–0.524]	0.552**	[0.486–0.618]	0.120**	[0.486–0.618]
60+	0.446**	[0.362–0.531]	0.500**	[0.411–0.590]	0.198**	[0.411–0.590]
Sex of the head of household						
Male®						
Female	−0.043	[-0.104–0.018]	0.025	[-0.048–0.097]	−0.147**	[-0.048–0.097]
Educational Attainment of the head of household						
No education®						
up to Primary	0.134**	[0.087–0.182]	0.234**	[0.181–0.288]	0.018	[0.181–0.288]
Middle/Secondary	0.233**	[0.184–0.283]	0.352**	[0.296–0.408]	0.123**	[0.296–0.408]
higher secondary	0.344**	[0.283–0.406]	0.467**	[0.399–0.535]	0.283**	[0.399–0.535]
Religion of household						
Hindu®						
Muslim	0.138**	[0.088–0.188]	−0.010	[-0.071–0.050]	0.143**	[-0.071–0.050]
Christian	0.126**	[0.036–0.216]	−0.006	[-0.090–0.079]	0.118**	[-0.090–0.079]
Sikh	0.232**	[0.132–0.332]	0.345**	[0.203–0.487]	0.120**	[0.203–0.487]
Others	0.002	[-0.148–0.152]	−0.182**	[-0.337–0.026]	0.150	[-0.337, −0.026]
Time						
2004 ®						
2014	0.376**	[0.331–0.420]	0.828**	[0.776–0.879]	−0.067**	[0.776–0.879]
2018	0.146**	[0.104–0.187]	0.520**	[0.466–0.573]	−0.149**	[0.466–0.573]

Note: ***p < 0.01, **p < 0.05, *<0.10 (indicates statistically significant).
Source: Authors own computation based on, Survey on Morbidity and Health Care: NSS 60th Round (January 2004–June 2005), Social Consumption - Health Survey: NSS 71st Round (June 2014) and Key Indicators of Social Consumption in India: Health, NSS 75th Round (July 2017–June 2018). 1US$ = 65.11 INR.

higher OOP for inpatient and outpatient care compared to those without elderly members.

3.5. OOP payment as a share of medical expenditure (%) in states of India, 2004-18

Fig. 1 shows the OOP payment as a percentage share of medical expenditure in states of India during 2004–18. In 2004, at the national level, the OOP payment accounts 97% as a share of medical expenditure. In 2004, the OOP payment as the percentage share of medical expenditure was the least in Chandigarh (77%), followed by Delhi (88%) and Mizoram (88%). By 2018, it was least in Mizoram (54%), followed by Meghalaya (76%).

3.6. OOP payment on inpatient and outpatient care from a two-part model

Table 5 shows the OLS regression of OOP payment on inpatient and outpatient care by socio-economic characteristics in India. The probability of incurring OOP payment on both inpatient and outpatient care for 30 days was 78% higher among the richest households compared to households belonging to the poorest quintile. Urban households had a 25% higher probability of incurring OOP payment compared to rural households. Households covered with some health insurance scheme were 5% less likely to incur OOP payment compared to households with no coverage by insurance schemes. The probability of incurring OOP payment for inpatient care of 365 days was positively associated with MPCE quintile, place of residence, household size, presence of an elderly member in the household, age of head of household, education of the head of households and time period. The likelihood of incurring OOP payment for inpatient care was 33% higher in urban households

Table 6
Adjusted out-of-pocket payment on inpatient and outpatient care (in US$) of households from two-part regression model at 2018 prices in states of India, 2004-18.

States	Inpatient and outpatient care (30 days)			Inpatient care (365 days)			Outpatient care (15 days)		
	2004	2014	2018	2004	2014	2018	2004	2014	2018
Andaman & Nicobar	44	46	47	414	444	466	18	19	18
Andhra Pradesh	31	35	32	282	341	302	14	14	13
Arunachal Pradesh	32	31	30	248	252	245	15	15	14
Assam	36	35	32	313	316	291	16	15	14
Bihar	28	30	27	233	254	230	13	14	13
Chandigarh	58	55	56	658	606	625	22	21	20
Chhattisgarh	26	27	24	217	248	221	12	12	11
Dadra & Nagar Haveli	36	38	29	330	385	258	15	16	13
Daman & Diu	32	38	36	322	400	366	13	16	15
Delhi	46	49	46	463	508	476	19	19	18
Goa	47	54	47	461	549	463	19	21	18
Gujarat	35	41	41	329	401	402	14	17	17
Haryana	41	44	43	385	437	419	18	18	18
Himachal Pradesh	39	45	42	372	454	428	17	18	17
Jammu & Kashmir	43	44	42	373	397	371	19	19	18
Jharkhand	29	32	28	254	280	245	13	14	13
Karnataka	31	38	37	288	361	356	13	16	16
Kerala	46	51	48	444	512	475	18	19	18
Lakshadweep	52	42	51	455	362	465	21	18	20
Madhya Pradesh	30	32	30	253	291	269	14	14	14
Maharashtra	38	41	39	354	404	379	16	17	16
Manipur	42	37	37	372	332	339	18	16	16
Meghalaya	37	39	38	296	332	328	17	17	16
Mizoram	49	44	46	415	390	411	20	17	18
Nagaland	51	45	43	438	397	364	22	18	18
Odisha	27	29	26	233	267	240	12	13	12
Pondicherry	38	47	41	384	492	405	14	18	17
Punjab	47	53	52	466	557	558	19	21	20
Rajasthan	32	37	36	286	348	335	14	16	15
Sikkim	33	34	36	293	320	344	15	15	16
Tamil Nadu	32	40	38	313	399	382	13	16	16
Telangana	32	35	36	292	346	353	14	14	15
Tripura	31	35	37	288	343	355	14	15	15
Uttar Pradesh	33	35	31	284	316	280	15	16	14
Uttarakhand	37	36	38	337	350	374	16	15	16
West Bengal	35	35	35	319	335	329	15	15	15
India	**34**	**37**	**35**	**308**	**353**	**332**	**15**	**16**	**15**

Source: Authors own computation based on, Survey on Morbidity and Health Care: NSS 60th Round (January 2004–June 2005), Social Consumption - Health Survey: NSS 71st Round (June 2014) and Key Indicators of Social Consumption in India: Health, NSS 75th Round (July 2017–June 2018). 1US$ = 65.11 INR

compared to rural households. The probability of incurring OOP payment on outpatient care for 15 days was negatively associated with coverage by health insurance schemes, sex of head of household and time period. Female-headed households were 15% less likely to incur OOP payment on outpatient care compared to male-headed households.

3.7. Adjusted OOP payment on inpatient and outpatient care from the two-part regression model

Table 6 shows the results of a two-part regression model and adjusted mean OOP payment on inpatient and outpatient care in 2018 at constant prices in the states of India. In 2004, the adjusted mean OOP payment on both inpatient and outpatient care for 30 days was the highest in Chandigarh followed by Lakshadweep, and it was the least in Chhattisgarh followed by Odisha in both 2004 and 2018. In 2018, the mean OOP payment on both inpatient and outpatient care was higher in Chhattisgarh followed by Punjab. The adjusted mean OOP payment on inpatient care of 365 days was highest in Chandigarh followed by Punjab and lowest in Chhattisgarh followed by Bihar during 2004–2018.

4. Discussion and conclusion

This paper provides comparable estimates of medical spending and OOP payment using appropriate survey data for over a decade and a half in India. Although earlier studies provided estimates of OOP, they were often at episode or for specific ailments and not comprehensive. We provide comprehensive estimates that includes all medical expenditures of households; hospitalisation, maternal care and outpatient visit. All estimates are presented using constant prices. It is the first study providing comprehensive and comparable estimates of OOP and medical expenditure at the household level using data from NSS based health survey in India. The following are the main findings of the study.

First, our finding suggests that health expenditure and the OOP payment of households remained high and increased during 2004–18. However, we found a decline in OOP during 2014–18 and the pattern was consistent for both inpatient and outpatient care. Second, reimbursement as a share of household health expenditure remained low in all three points of time. Third, economic gradient of OOP payment and medical expenditure was strong. The OOP and medical expenditure was higher among the richer and richest sections of the population. Fourth, the state variation in medical expenditure and OOP payment was large over time. Besides, time was a significant predictor suggesting that medical expenditure increased during 2004–14 and showed a marginal decline during 2014–18. We provide some plausible explanation in support of the findings. The pattern of household health expenditure and the OOP remained high and similar over time. Among others, the high OOP may be attributed to increasing non-communicable diseases, increasing utilisation of health services, low quality of care in public health centres, low insurance coverage and lack of tertiary care facilities in rural areas.[22–26] Majority of the households are not covered by any health insurance scheme possibly resulting in high OOP in the country. Not only the OOP remained high, the incidence and intensity of catastrophic health spending remained high.[27] It may be mentioned that health is a state subject and largely regulated by the state government.

Studies suggest that the provision of free medicine at public health facilities, quality of care in public health services and public-private partnership contribute in reduction of OOP.[28,29] The reduction of OOP payment during 2014–18 may partly attributed to the success of the National Health Mission.[28–30]

Developing countries are adopting various health protection schemes to save households from catastrophic health spending. For instance, the introduction of co-payments for hospital care in Kyrgyzstan had reduced the OOP payment on inpatient care.[31] The national health insurance program had reduced the OOP payment but the beneficiaries still incurred large OOP in Philippines.[32] OOP payments for medical services seemed equally widespread for both inpatient and outpatient care in Russia.[33] Recently launched *Ayushman Bharat* is the largest ever health insurance schemes in the country and that has potential to reduce the OOP in the country. The Ayushman Bharat (PMJAY) was implemented in 23 September 2018 to provide financial protection and reduce OOP payment on health care. It is a centrally designed insurance scheme with major financial support from Government of Inia. The PMJAY aimed to cover nearly 10.74 crore poor families which comes to a staggering 50 crore Indians that form 40% of its bottom population. The scheme includes 3 days of prehospitalization and 15 days of post hospitalisation expenses with an annual coverage of Rs 5 lakh for a family registered under the programme. The beneficiaries can avail the facility at any empaneled public/private health facility. As of date, 18 crore PMJAY card has been generated and over 3.2 crore of hospitalisation facility availed.

We outline the following limitations of the study. The study could not capture the effect of Ayushman Bharat launched in 2018 to provide financial protection to the poor and needy. Second, reasons for variation in OOP at the state level could not be explored. Despite these limitations, the findings provide comprehensive information on key indicators that may be used for monitoring health-related SDGs. Efforts need to be intensified to reduce high OOP payment, medical expenditure in poorer states and among disadvantaged sections of the population.

Ethics approval and consent to participate

The study based on secondary data available in the public domain, needs no prior approval.

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Authors' contributions

SKM and BP: Conceptualization of the study; SKM, RRS and US: formal analysis and interpretation; SKM, RRS and US: drafting the manuscript; SKM, BP, RRS and US: critical revision of the manuscript for important intellectual content. The authors read and approved the final manuscript.

Consent for publication

Not Applicable.

Availability of data and materials

Not Applicable.

Declaration of competing interest

The authors declare that they do not have any conflict of interest.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.cegh.2022.101139.

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