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THE HEALTH EXPENDITURE INDUCED IMPOVERISHMENT: A STUDY ON HOUSEHOLD FINANCING OF HEALTHCARE IN KERALA

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1. Introduction

The State of Kerala has received international attention for its remarkable achievement in the social indicators, despite its lacklustre performance on economic fronts till the end of 1980s. In the post reform era, however, concerns have been expressed about the sustainability of its social development. But evidence seems to indicate that high level of human development have helped a lot in sustaining development of social sector and promoted higher economic growth in the state. While social scientists pondered the possible lessons of Kerala's health achievements, social scientists within Kerala became disquieted over a number of disturbing trends. Although mortality is low, the morbidity both form urban and rural is high in Kerala compared to other Indian states. The NSSO's 71st round (2014) reported that morbidity rates per 1000 population for rural and urban areas were 310 and 306 respectively against the national rate of 89 and 118.

Although the state has been successful in controlling a number of communicable diseases earlier, the emergence of Dengue, Leptospirosis, Hepatitis, and H1N1 in recent years has led to considerable increase in morbidity and mortality (Economic survey 2016). State is witnessing an increasing burden of both communicable and non-communicable diseases such as diabetes, cardio-vascular disease, hypertension and cancer. Kerala's disease profile is fast changing to one where both infectious and degenerative diseases contribute equally to morbidity.

Ageing is another area of concern of Kerala health that accounts for hike in morbidity. Kerala has the highest proportion of elderly among the Indian states with 12.55 per cent of its population above 60 years of age (Census 2011). Currently 42 lakh people of Kerala are 60 and above, 13 per cent of them are 80 years of age and over. NSSO 71st round indicates that 65 per cent old are morbid (Economic Survey 2016). Thus, in Kerala the people are now facing the problem of high morbidity both from re-emergence of communicable diseases and the second generation problems like the ageing population and non-communicable diseases of opulent (NRHM report, 2009).

There have been widespread marketization and commodification of healthcare since 1991 in Kerala. The private sector in Kerala has a dominant presence in all the submarkets-medical education and training, medical technology and diagnostics. The neoliberal period witnessed the mushrooming of high-technology diagnostic centers, multi- super specialty hospitals in private sector. Unfortunately, government has failed to regulate, standardize, and control the private sector. Often, there are widespread unethical practices, including medically unwanted surgeries, unnecessary and expensive laboratory tests, and inappropriate drug prescriptions (Thresia, C.U 2014). Considering the high cost of diagnostic tests, medicine and longer tenure of treatment, the treatment of non-communicable diseases constitutes a drag on the financial edifice of the households. The change in the spectrum of diseases from communicable to chronic, non-communicable chronic diseases especially, cardiovascular diseases, diabetes, hypertension, and cancer has been fuelling the cost of healthcare in the state. With the onset of advanced stage of demographic transition in Kerala, the rising incidence of non-communicable chronic diseases, higher rate of ailment among elderly, domination of private sector in healthcare provisions is going to pose serious challenges to the financing of healthcare at household level.

Thus, the implementation of Kerala's health promotion policies has generated two sets of outcomes; life expectancy and mortality rates have improved while the reported incidence of morbidity has increased. So it would seem that the benefits from enhanced life expectancy are being dissipated though disability and sickness, not only impacting on individuals but on productivity and economic well-being. What seems to be happening is that death being averted at great cost to the quality of life. This paper makes an attempt to examine catastrophic nature of out of pocket expenditure among three types of household, viz self-employed, regular wage earners and casual labours from three regions of Kerala state.

2. Data and Methods

The analysis is based on the cross section data from primary survey conducted among three types of households, viz ,self-employed(Type-I households), regular wage earners (Type-II households) and casual labour(Type-III households) in three regions of Kerala state. The households were selected on the basis of multi-stage random sampling methods. The primary data was collected from households through a structure questionnaire. A total of 480 households comprising 2734 individuals were covered during the survey.This survey collects information regarding morbidity pattern, utilization of health care services and out of pocket (OOP) health expenditures made by households for the health services utilized by its member for out-patient treatment for a reference period of the last 30 days prior to the primary survey. In this study, attempt has been

made to estimate how different types of households financed out-patient treatment expenditures and how it varies with level of treatment and socio-economic backgrounds of the households. The survey was conducted during January 2016- May 2016. During the reference period, 718 incidence of out-patient treatment from 385 households were reported. Type-1 households reported 34.5 per cent of the out-patient treatment cases out of total cases of 718. The corresponding percentages for Type-2 households and Type-3 households are 24.5 and 41 per cent respectively.

3. Analytical Methods

The catastrophic health expenditure has been defined as amount of out- pocket health expenditure exceeding a pre-determined proportion of household consumption expenditure at which the household is forced to sacrifice other basic needs, sell assets, incur debt or be impoverished (Berman et.al 2010). Thresholds used by different researchers to estimate catastrophic health payments vary from 10 per cent to 20 per cent of total income, or 20-40 per cent of non-expenditure of the households. K. Xu et al., (2003) define catastrophic health expenditure in relation to the non-food expenditures of the households. The out of pocket expenditure on healthcare is determined as being catastrophic if a household's out of pocket health expenditure exceeds 40% of non-food expenditure. The non- food expenditure is taken to be the amount in excess of 45th and 55th percentile of the average expenditure of the households. Another definition is based on 'household capacity to pay', where household payments for basic consumption needs such as food are firstly deducted from household income or total expenditure. In this approach, out of pocket expenditure is categorised as catastrophic if it exceed 40 per cent of non-food expenditure.

In the present study, the catastrophic health expenditure is defined as the case where out-of pockets health expenditure of the households exceeding at three benchmark level at 10 per, 15 per cent and 20 per cent of the total consumption expenditure. Another definition used for the analysis is that households may face catastrophic health expenditure if its consumption expenditure exceeds 40 per cent of the non-food expenditure. Thus, OOP expenditures on treatment are said to catastrophic

$$\text{when} \quad \frac{OOPhexpHH}{MLExpHH} > \Theta$$

Where Θ= threshold level- 10, 15 and 20 per cent of monthly consumption expenditure. This method indicates the extent to which the number of households whose OOP expenditure on treatment as a proportion of total monthly consumption expenditure exceed the threshold level (Θ).

The methodology applied in the present study for computing the extent of impoverishment is based on approach followed by Xu et al (2003), Wagstaff and Doorslaer (2003) and Peter Berman et al, (2010). This method attempts to estimate the impact of OOP payments for healthcare on the two fundamental measures of poverty – the headcount and the poverty gap.

Health expenditure is impoverishing if it is sufficiently large to make the difference to the households being above or below the poverty line (Peter Berman et al,.2010). This approach involves two estimates: Poverty headcount (incidence) analysis and Poverty Gap (intensity) analysis by estimating the difference between gross consumption (including health expenditure) expenditure and poverty line benchmark versus net consumption expenditure (after adjusting for health expenditure) and poverty line benchmark. The poverty headcount is the proportion of individuals whose consumption expenditure fall below the official poverty line , and the poverty gap is the average amount by which individuals fall short of achieving the poverty line (Wagstaff and van Doorslaer 2003; Garg and Karan 2009; Peter Berman 2010;Ghosh 2010;SamikChaudhury 2011). The unit of analysis is households for assessing the financial ramifications of out of pocket (OOP) expenditure on health care. To assess the impoverishing effect of the out-of-pocket health care expenditure on households, we have computed per capita household consumption expenditure (PCHCE) gross of the health care expenditure and have compared it with Planning Commission (2011-12) cut-off values of per capita monthly income eligible for categorization of household below poverty line (BPL) for rural and urban households for Kerala state. In the second stage, find out proportion of households pushed below BPL by estimating the difference between the per capita household consumption expenditure net of out of pocket expenditure on healthcare and poverty line benchmark. Thus, we obtain two sets of distribution of households falling below the official BPL, one gross of health care expenditure and another after adjusting for the OOP health care payments. The difference between the two distributions provides the proportion of households impoverished as a consequence of the out-of-pocket health care expenditure. For estimating the impoverishing effects of out of pocket health expenditure, we use criteria used by Rangarajan committee for defining poverty line for Kerala state both for rural and urban areas. For rural area, it is fixed at per capital monthly consumption expenditure of Rs. 1054 and Rs, 1354 and urban area.

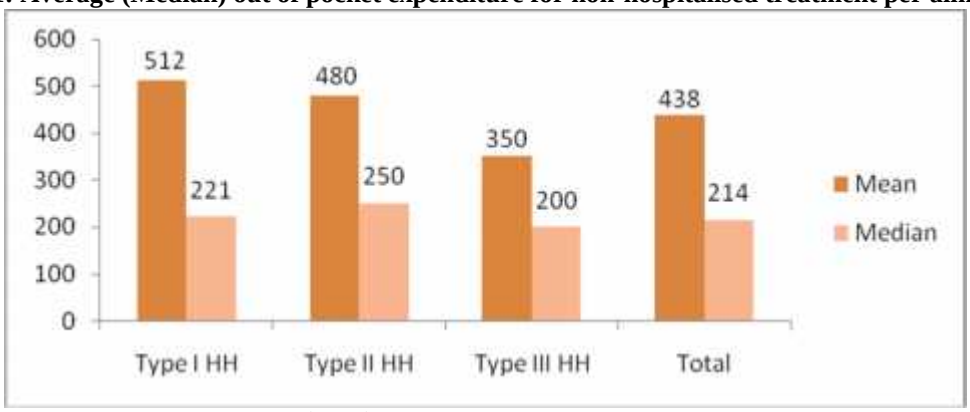
Results and Discussion

4. Cost of Outpatient Care

Since OOP expenditure on healthcare are generally skewed toward higher values, the median may be a more appropriate measure. Hence, median value is also reported along with mean in the study. The overall average out-patient expenditure per

non-hospitalised treatment is found to be Rs. 438(median Rs.214) among the sample population during the reference period of one month preceding the survey. The highest average OOP expenditure is reported by Type-I households (Mean=Rs.512, Med=Rs221) and lowest OOP is incurred by Type-III households with an average expenditure of Rs.350 (Med=Rs.200).

Fig 1: Average (Median) out of pocket expenditure for non-hospitalised treatment per ailment.



Source: primary survey (2016)

Among the regions, the average OOP expenditure for out-patient treatment is highest in central region (Mean=479, Med=200), whereas the Southern region reported lowest average OOP expenditure of Rs.416 (Med=182). The Kruskal-Wallis test indicated no statistically significant (P>0.05) differences in the OOP expenditures across the households among different regions. The estimates of OOP expenditure incurred per treated person for non-hospitalised care shows that on an average, a higher amount was spent for ailing person in urban areas. The average out-of pocket expenditure for a patient in urban area was Rs.474 (median Rs230) and that of rural area was Rs.407 (median Rs. 200). The distribution of average out-patient treatment between rural and urban areas across the household indicates that the patients from urban Type-II household(Rs.557, Med=283) and Type-I households (Rs.521) from rural spend more on out-patient treatment. Comparatively low rate of OOP expenditure for out-patient treatment in the case of Type-III households may be due to the higher utilization of public healthcare facilities. There is no significant different in the OOP expenditure for non-hospitalized treatment between urban area (with a mean rank of 368(N=328) and rural areas (with a mean rank of 352 N= 390) for urban area,M-W (U)=-1.098, P>0.05.

The OOP expenditure for out-patient treatment were significantly affected by the age-group of the patients, H (2) =10.225, P=.006. Pairwise comparisons indicated significant in the cost of out-patient treatment between age 0-14 and agedpeople(P=.007).The OOP expenditure for non-hospitalized treatment were significantly affected by religious affiliations of the households as per Kruskal-Wallis test (2) =9.903, P=.007. The pair-wise comparison with adjusted p-value indicated significant differences in OOP between Hindu and Muslims households (P=. 006).The Kruskal-Wallis test indicated that the social groups to which households belong also seems to be significant factor in the health expenditure for out-patient treatment, H (2) =8.88, P=.012. It can be seen from the table(1) that average OP expenditure is higher for general category as compared to other social groups. The pairwise comparison with adjusted p-value indicates significant difference in the cost of non-hospitalized treatment between SC/ST and OBC (P=.021) and SC/ST and General categories (P =.011) and no significant difference between OBC and general categories (P>0.05).

Mann-Whitney test reveals significant difference between low income group (mean rank =301,N=434) and high income group (mean rank =448,N=284) in the OOP expenditure for non-hospitalised treatment, Z=-9.352,P=0.000. This higher level of spending is attributable to the fact that households in the high income groups often seek care more from private sector for non-hospitalized treatment. The education status of head of the households not seems to be a significant factor in the OOP expenditure.

The OOP expenditure on out-patient treatment differ significantly between public and private sector with a mean rank of 256(N= 322) for public sector and a mean rank of 396(N=443) for private sector Z=-11.984, P= .000.A household's decision on the level of healthcare providers may ultimately determine the magnitude of its OOP health care expenditure, as out-patient treatment received public healthcare centres cost less than those received from private hospitals.In Kerala, the majority of the population depends on private providers for outpatient care (around 66 per cent as per 71st round NSSO, 2014). The present study also confirms the premier role of private sector in the provision of treatment facilities (73.3 per cent) for non-institutionalized care. This reliance on private healthcare providers is strikingly higher among Type-I households.

The coefficient (β) of the log-linear regression model indicates that for the out–patient treatment, patients would have to incur 48 per cent more out of pocket expenditure for the treatment in private sector as compared to public sector. The greater reliance on the private sector for treatment leads to high OOP expenditure in the case of Type-I households followed by Type-II households. They, on an average, spent Rs. 679 and Rs. 598 respectively for out-patient treatment during the reference period of 30 days. Meanwhile Type-III households spend on Rs.444 for the ambulatory care.

The Mann-Whitney test indicates significant cost differentials in the treatment of chronic and acute illness, U-2.761 P = 0.006. For the treatment of acute illness, the households on an average spent Rs.331 per cases against Rs.484 spent on the treatment of chronic illness. This difference is obvious because chronic diseases are perennial in nature which requires continuous treatment; usually it costs more than that of acute diseases.

Table I: Distribution of average OOP among three types of household by socio-demographic and economic characteristics of the households

	Type-I HH		**Type-II HH**		**Type-III HH**		**Total**	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**
South	364	170	596	217	342	179	416	182
Central	668	210	439	225	303	120	479	200
North	455	280	378	277	408	308	417	287
Rural	521	235	371	145	342	200	407	200
Urban	502	221	557	283	364	198	474	230
Total	512	221	480	250	350	200	438	214
male	573	226	558	254	384	250	490	250
female	462	210	421	231	322	150	395	200
0-14	260	150	233	113	400	268	321	167
15-59	510	230	443	250	324	180	411	200
60 +	589	250	669	435	382	226	541	255
4 & below	561	200	442	170	352	195	434	200
5 & above	486	230	510	259	349	206	441	230
Hindu	374	200	425	218	363	212	383	201
Muslim	608	400	717	405	318	250	521	305
Christian	708	200	478	260	337	120	518	200
SC/ST	325	113	133	48	309	150	261	123
OBC	480	260	512	250	362	233	432	250
General	584	200	550	310	336	131	518	200
Low Income Group	359	135	267	112	273	126	296	120
High Income Group	665	308	710	308	574	454	654	350
Primary & below	531	282	356	123	334	195	392	205
Above primary	503	200	521	262	369	202	467	220
PHC/dispensary/CHC	61	2	47	10	70	2	62	2
public hospital	289	80	415	100	358	150	350	114
private doctor/clinic	553	370	487	350	381	305	468	326
private hospital	822	338	747	508	660	515	763	485
public hospital	218	49	279	39	279	81	262	65
private hospital	679	325	598	384	444	314	581	340
Chronic	584	260	515	255	386	200	484	226
Acute	358	150	397	202	264	219	331	195

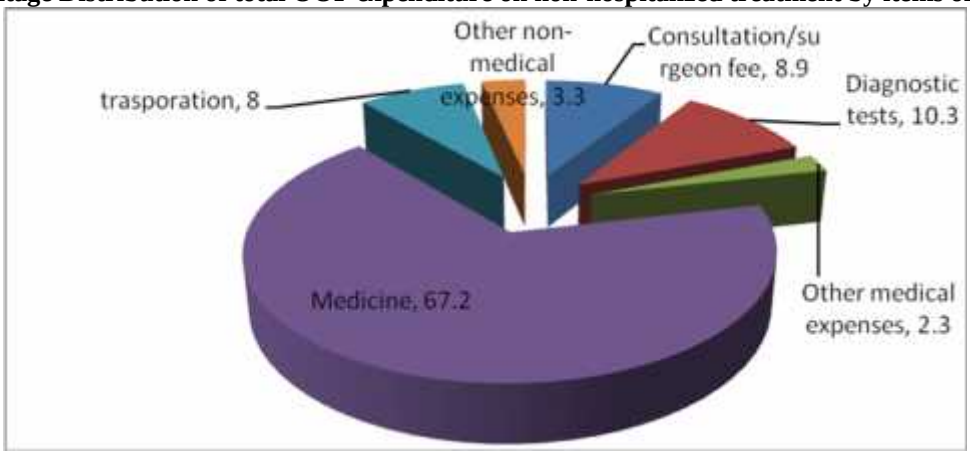
Source: primary survey (2016)

5. Category-Wise Outpatient Expenditure

The total OOP expenditure for non-hospitalised treatment comprises of expenditure on medicines, consultation fees including fees for surgery, if any, fees for diagnostic test, and other medical expenditures. In the category of non-medical expenditure, we included mainly the expenditure on transportation and outlay on food both for patients and accompanying person(s). Medicine alone accounted for around 67.3 per cent of the OOP incurred on out-patient treatment. 10.3 per cent of OOP expenditure on diagnostic tests indicates the widespread use of technology in treatment. The other medical expenditure formed 3.3 per cent of the total OOP expenditure for non-hospitalised treatment. One of the major components of the non-

medical expenditure is transportation cost which accounts for about 8 per cent of the total OOP expenditure for non-hospitalised treatment. The fees for consultation formed 8.9 per cent of the total household OOP expenditure of the households on out-patient treatment.

Fig 2: Percentage Distribution of total OOP expenditure on non-hospitalized treatment by items of expenditure



Source: primary survey (2016)

Economic Burden of Care

It is obvious from the table (2) that the incidence of catastrophic OOP expenditure decreases as the threshold level is increased to estimate it. At lower threshold level of 10 per cent of monthly consumption expenditure , about 22.3 per cent of the households incurred more than 10 per cent of their monthly consumption expenditure for treatment of diseases during the reference period of 30 days before primary survey. At 15 per cent threshold, the number of households facing catastrophic OOP expenditure for out-patient treatment decreases to 65. At a higher threshold level of 20 per cent, the number of the households facing the catastrophic health expenditure again decreases to 40.

In terms of capacity to pay (i.e., health expenditure ≥ 40 per cent of non-food expenditures), as many as 9.4 per cent of the household (45 households) spent more than 40 per cent of their non-food expenditure on out-patient treatment during the recall period. It is evident from the table (2) that there is no discernible difference in the number of cases of catastrophic health expenditure reported between rural and urban areas of the study area. What is alarming is that there are 17 households which have spent above 40 per cent of their monthly consumption expenditure on outpatient treatment.

Table 2: Distribution of Number of households facing catastrophic OOP expenditure by place of residence.

		Type –I HH		Type-II HH		Type-III HH			
		Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
OOP >10 %	OP	19	17	7	20	28	16	54	53
	IP	16	23	8	18	18	16	42	57
OOP> 15%	OP	11	11	5	11	17	10	33	32
	IP	14	18	5	11	12	11	31	40
OOP > 20 %	OP	6	6	5	6	10	7	21	19
	IP	10	16	3	7	8	8	21	31
OOP > 40% of NFE	OP	8	6	5	7	12	7	25	20

Source: Primary survey (2016), NFE= Non-food expenditure

6. The impoverishing effects of out of Pocket Expenditure

The catastrophic payment headcount indicates that there were only 29(6.04 per cent of the households) households whose gross monthly consumption falls below the poverty bench mark. The catastrophic payment gap (after adjusting health expenditure) indicates that there were 77 households (16.04 per cent of total number of households) fall below the poverty bench mark. The difference between the two indicates the number of households impoverished (48 households) due to out of pocket expenditure on non-hospitalised treatment.

Of the 77 households, about 25 households seek out-patient treatment from public health care centres, 30 households exclusively depend on the private healthcare providers and 22 households utilize both sectors for out-patient treatment during the recall period. Among these households, the average OOP incurred on non-hospitalised treatment is Rs.1289 (Med=750) for Type-I households. The corresponding averages are Rs.1646 (med=1400) and Rs.920 (Med=700) for Type-II and Type-III households respectively.

The difference between catastrophic payment headcount and catastrophic payment gap shows that 10 per cent of the households face impoverishment consequent upon OOP expenditure on ambulatory care. It means that 48 households sliding below poverty level after incurring out-of-pocket expenses incurred on non-hospitalised treatment.

It is noted that the impoverishment effect of the OOP health care expenditure is felt only among the urban households after controlling for other factors. Region wise result shows that, the increase in the poverty gap is the most for the southern region (37.5 per cent of impoverished household) and was less in northern region (27.08 per cent). But no statistically significant regional variations in the poverty headcount ratio is reported by the non-parametric test, $\chi^2(2) = 1.887$, P=0.389.

The increase in poverty gap for the Type-III household (41.67 per cent) is higher than that of other types of households indicating that that OOP payment for health deepened poverty the most among casual labour households. Among impoverished households, 69 per cent of ambulatory care is required for the treatment of chronic illness. And 74 per cent of them seek out-patient treatment from private healthcare providers.

7. Determinants of Catastrophic OOP Health Expenditure

The Logit model is used to find out the significant correlates of incidence catastrophic out-of-pocket expenditure for non-institutionalised treatment by households. The results of logit model are shown in Table-(3). During bivariate analyses, place of residence (p=0.00), formal education of head of the household, level of living (P=0.011) and size of the households (p=0.000), are found to be significant explanatory variables in determining the probability of catastrophic health expenditures.

The explanatory factors that negatively affect the catastrophic OOP health expenditure are education and economic status of the head of the households. The higher education status (general education higher than secondary level) of the head of the households reduces the probability of incurring catastrophic health expenditure. The percentage of households with catastrophic health expenses was higher in the lower income groups among all three types of households. The households belonging to SC/ST and OBC social group have higher probability of experiencing impoverishment due to OOP expenditure on treatment than that of general category. The gender of patients has no bearing on the incidence of catastrophic health care expenditure.

The results of logistic regression model also indicate that the level of living (economic status) turns out to be one of the most important correlates of catastrophic expenditure (P=0.00). The negative β coefficient associated with high income households indicates that high income households are facing lower risk of incurring catastrophic health expenditure than that of the low income households. The education status of the head of the household above secondary level reduces the possibility of catastrophic OOP health expenditure. The households with five or more than five members have higher risk of incurring catastrophic expenditure on out-patient treatment (P=.000). The place of residence of the patients has significant bearing on the probability of facing catastrophic health expenditure.

Table 3: Correlates of catastrophic health expenditure (Dependent variable: HH with catastrophic OOP health expenditure)

	Coefficient	Std. Error	z	p-value	Exp(β)
<Secondary					1
≥ Secondary	-0.900486	0.356011	-2.5294	0.01143	0.406372
≤ 4					1
≥5	1.81033	0.400123	4.5244	<0.00001	6.11246
Low income group					1
High income group	-1.74944	0.417125	-4.1940	0.00003	0.173871
Rural					1
Urban	3.54835	0.483398	7.3404	<0.00001	34.7559
North					1
south	0.257412	0.41213	0.6246	0.53224	1.29358

central	-0.00607869	0.454481	-0.0134	0.98933	0.99394
Christian					1
Hindu	-0.539871	0.464193	-1.1630	0.24482	0.582823
Muslim	-0.721413	0.589224	-1.2243	0.22082	0.486065
General					1
SC_ST	1.12043	0.620456	1.8058	0.07095	3.06617
OBC	0.954414	0.46969	2.0320	0.04215	2.59715
Type-I					1
Type_II	0.295822	0.445101	0.6646	0.50629	1.34423
Type_III	0.274653	0.39957	0.6874	0.49185	1.31607
Constant	-9.48355	1.38532	-6.8457	<0.00001	

8. Conclusion

The study indicates the dominance of private healthcare provider in the out-patient treatment. The higher morbidity rate among the aged people and most of them suffer from chronic illnesses, which generally require treatment for longer duration, the monetary cost of treatment per illness episode is expected to be a burdensome to the households. It is obvious from the analysis that with the aging of population, the cost of treatment becomes unaffordable to many of the households which in turn impairs the financial stability of the households particularly Type-I and Type-III households. To mitigate the catastrophic nature of the out of pocket expenditure associated the treatment of aged people, there should be cost effective geriatric healthcare programmes in the public sector.The present study suggests that one in every tenth households impoverished on the account of OOP expenditure on healthcare. As far as social and religious groups are concerned, the catastrophic gap was higher for SC/ST households (7.27 per cent) and for Muslim households (8.16 per cent). It is clear from the data that households from SC/ST particularly from Type- III households are more likely to incur catastrophic health expenditure than that of other types of households. On an average, the households impoverished on the account of OOP expenditure had to spend around 15.89 per cent of their monthly consumption expenditure for treatment of various ailments.Even economically better off households may be impoverished by the magnitude of out-of-pocket payments arising from unexpected health shocks. The incidence and intensity became less amongst the Type-II households. The incidence of impoverishment reported among the Type-II households indicate that even though all of them are employed in private sector, they are not eligible for concessional treatment facilities under ESI Scheme as their monthly salary exceed the level fixed for the concession. This finding affirms the need for policy attention on enhancing the salary limit eligible for the concessional treatment provided to the employers of the ESI schemes.The protection of interest of people engaged in informal sectors especially those belonged to Type-I and Type-III households should be address in policy formulations to ensure affordable healthcare facilities and dilate insurance coverage so as to include out-patient treatment cases also into the purview of the community health insurance schemes.

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