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Catastrophic Health Expenditure due to Inpatient Medical Care in Kerala

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Abstract:
Background: Since the 1990s, inpatient medical care in India and Kerala has increased due to the growing prevalence of non-communicable diseases with consequences on higher out-of-pocket health expenditure. Out-of-pocket health expenditure as a fraction of total income exceeding a threshold limit becomes catastrophic for the household and is documented as the major reason for households falling into poverty. Catastrophic health expenditure and headcount ratio due to inpatient medical care in Kerala compared with the national level can provide inputs for inclusive health care policies, particularly on the necessity for social protection and insurance coverage.
Materials and Methods: The study uses unit-level data of NSSO 75th round Social Consumption: Health to derive the results. Components of medical and non-medical costs of inpatient medical care are estimated. Out-of-pocket health expenditure is estimated as expenses incurred for inpatient treatment less medical insurance availed and when out-of-pocket expenditure exceeds 10 percent of the total expenditure, the household is said to have incurred catastrophic health care expenditure.
Results: Results show that inpatient medical care expenditure in Kerala is higher than all India levels and 93.70 percent of inpatient medical care expense in Kerala is out-of-pocket against 89.94 percent at the all-India level. The catastrophic headcount ratio of 34.70 percent in Kerala is higher by 7.43 percent compared to the all-India level of 32.35 percent. The catastrophic headcount in India and Kerala due to inpatient medical care exhibits variations across socio-economic categories.
Keywords: Out-of-Pocket Health Expenditure, Catastrophic Health Expenditure, Inpatient Medical Care

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I. Introduction

Healthcare financing in developing and low-income countries is still predominantly based on out-of-pocket payments and the lack of prepayment mechanisms like insurance. In the absence of insurance coverage, health care becomes expensive, and households with immediate medical needs are forced to spend a large part of the household budget on health[1]. This increased budget share on health care is accommodated by several cost-cutting strategies like reduction of consumption of goods and services or by running down savings, accumulating debt, or selling assets. Illness not only reduces welfare directly; it also increases the risk of impoverishment due to high treatment expenditures[2].The literature on out-of-pocket (OOP) payments acknowledges that healthcare expenditure can drive individuals and households into poverty[3]. The concept of catastrophic payment has been put into operation by defining it as occurring, once OOP payments cross some threshold share of household expenditure and is considered a major concern in the health financing system of any country. OOP health payments over the threshold budget share express severe disruptions to household living standards and its termed catastrophic[4]. Catastrophic healthcare expenditure (CHE) also points to the linkage between poverty and increased health expenditure both from an ethical approach and level of living approach to poverty. Hence analysing catastrophic healthcare expenditure is essential to provide inputs to further inclusive healthcare policies.

In India, out-of-pocket expenditure is the principal source of health care finance. As per the National Health Estimates (2019)[5] by the Government of India, almost 53.2 percent of total health expenditure in India was paid by the common man from his pocket. Many studies based on NSSO data report that OOP expenses become catastrophic for a significant proportion of the Indian population[6]. The epidemiological transition in India, in favour of chronic non-communicable diseases (NCDs), is raising catastrophic expenditure since NCDs require long hospital stays and prolonged costly treatment. Kerala state which is more advanced in epidemiological transition has become the harbinger of several NCDs. Kerala reports the highest prevalence of cardio-vascular diseases, and cancers and is termed the diabetes capital of India[7]. As per the latest NSSO survey, the

hospitalization rate in Kerala is reported as 100 per 1000 population as against 26 for 1000 population at the national level. The proportion of the population admitted for inpatient medical care in private hospitals in Kerala is 66 percent as against 33 percent in public hospitals and the estimated cost difference between public and private hospitals in Kerala is reported as five times[8].These factors have resulted in an increasing proportion of household income being allotted to health care. The study against this background examines inpatient medical care in Kerala with emphasis on the cost of treatment, out-of-pocket expenditure, and catastrophic health care expenditure, and the same is compared using national-level data.

II. Objectives

1. To estimate the direct medical and non-medical costs of inpatient medical care in Kerala.
2. To estimate the health expenditure incurred for inpatient medical care as a percent of total household expenditure across different socio-economic categories in Kerala.
3. To estimate the incidence of catastrophic health care expenditure across different socio-economic categories in Kerala due to inpatient medical care.

III Methodology

The study relies upon unit-level data extracted from the 75th round of NSSO from July 2017 to June 2018, titled Household Social Consumption on Health in India. The main objective of the survey was to gather basic quantitative information on the health sector viz. morbidity, the profile of ailments including their treatment, role of government and private facilities in providing healthcare, expenditure on medicines, expenditure on medical consultation and investigation, hospitalization and expenditure thereon, etc. NSS health surveys are based on scientific sampling procedures and unit-level data for the specified variables are available for all states in India. The 75th round of NSS health survey results from the state of Kerala is based on data from 4467 households, covering 2392 rural and 2075 urban with a total population of 19801(10682 from rural and 9119 from urban).

The cost of inpatient medical care is divided broadly into medical and non-medical components. Medical costs are related to diagnosis and treatment and include payment of doctor's fees, expenditure towards medicines, hospitalization charges, and expenditure for pathological tests. Non-medical costs include transportation costs to health care, cost of special foods, lodging charges for other members accompanying, and other expenses. The various components of direct expenditure incurred by the respondents while availing of inpatient medical care is worked out using the NSSO data set.

Regarding catastrophic health expenditure, the ethical position is that no one ought to spend more than a given fraction (say Z) of their income on health care. A figure for such a threshold level is inevitably arbitrary, and a threshold of 10 percent is considered in the literature[9]. The data required is at the household level containing information on both health care payment (say H) and living standards. Living standards are o measured by an "ability to pay" variable (say Y) such that, Y equals total expenditure incurred by the household.

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

The catastrophic payment headcount which measures the incidence of catastrophe is,

$$HCR = \frac{1}{N}\sum_{i=1}^{n} Ei$$

where N is the sample size. HCR is a measure of the incidence of catastrophic healthcare expenditure.

IV RESULTS

Medical and Non-Medical Expenses of Inpatient Medical Care

Kerala reports a higher expenditure, both for medical and non-medical inpatient medical care. The average expenditure incurred per person for inpatient medical care in Kerala for the year preceding the survey is INR.21162.72 which is 22 percent higher than the respective expenditure at the all-India level of INR.173985. Medical expenses for inpatient medical care in Kerala per person is worked out as INR.20048 which is 18 percent higher compared to the all-India level of INR.17011. Other medical expenses are significantly higher in Kerala reporting a 90 percent higher expense than the all-India level. Bed charges, diagnostic tests, medicine fees, etc incurred for inpatient medical care in Kerala are higher than the all-India average. Even though the transportation cost for the patient is more or less similar for Kerala and India, for other non-medical expenses, including lodging and accommodation charges Kerala has a 26 percent higher expense compared to the all-India level. For treatment that is given as a package component, Kerala has an expenditure of INR.22970 against the all-India average of INR.18422.

Table 1: Medical and non-medical expenses of inpatient medical care in Kerala[8]

Components of expenditure	India	Kerala	Percentage difference
Package component (INR.)	18422.44	22970.82	24.69
Doctor's/ surgeon's fee (INR.)	5025.4	5209.98	3.67
Medicines (INR.)	4829.91	5567.65	15.27

Diagnostic tests (INR.)	2429.47	2944.1	21.18
Bed charges (INR.)	3040.02	3793.69	24.79
Other medical expenses (INR.)	2060.94	3934.33	90.90
Medical expenditure (INR.)	17011.29	20047.93	17.85
Transport for the patient (INR.)	666.34	679.41	1.96
Other non-medical expenses (INR.)	1364.36	1720.99	26.14
Total expenditure	17395.85	21162.76	21.65

Table 2 shows the total amount reimbursed by medical insurance, and out-of-pocket expenses incurred at the state level and national level for inpatient medical care. At the national level, out of the total expenditure of INR.17395 which is incurred as expenditure for inpatient medical care, INR.1750 is reimbursed as medical insurance whereas out of the INR.21162 incurred as cost for inpatient medical expense in Kerala, INR.1223 is reimbursed as medical insurance. Thus, the expenditure for medical care is much higher in Kerala compared to the all-India average, whereas the amount reimbursed by medical insurance is much lower in Kerala compared to the national average. Hence the medical insurance reimbursed for inpatient medical care is 30 percent less in Kerala compared to the national average. This has led to high out-of-pocket health expenditure in Kerala - Kerala reports an out-of-pocket health expenditure rate of 93.87 whereas the figure at the national level is 89.94 – thus reporting a 4 percent higher level.

Table 2: Insurance and Out-of-Pocket Health Expenses for Inpatient Medical Care in Kerala[8]

Particulars	India	Kerala	Percentage difference
Expenditure (in INR.) for inpatient medical care	17395.85	21162.76	21.65
Amount reimbursed by medical insurance (in INR.)	1750.64	1223.3	-30.12
Out of Pocket health expenditure (in INR.)	15643.12	19938.37	27.46
OOP percent	89.94	93.87	4.19

Expenses Incurred for Inpatient Medical Care as Percent of Total Household Expenditure across Socio-Economic Categories

Table 3 shows the expenditure incurred for hospitalization as a percent of total household consumption expenditure. On an average, a household in Kerala that has a person hospitalized spends 14.86 percent of its total household expenditure on inpatient medical care. The percent share of expenses depends upon the type of medical institution in which treatment is sought and also is affected by the socio-economic status of the inpatient. Data shows that for those who are hospitalized in a private hospital, 20 percent of their total expenditure falls for inpatient treatment, whereas for the public sector, the corresponding percentage is 4 percent. In comparison with the national average, it is evident that the inpatient medical expenditure as a percent of total expenditure is high for a public hospital in Kerala compared to the national average – an increase of about 76.76 percent, whereas for the private sector, the concerned figures are lesser for Kerala. The socio-economic category-wise percent share of inpatient medical expenses to total expenditure shows that for the illiterate category, the expenses is 9.17, and for other categories, the expenses is around 15 percent. For graduates, the expenses is 17 percent. Compared with the national level, the percent share of inpatient medical expenditure to total household expenditure for an illiterate and graduate category for Kerala is lesser than the national level and for all other educational categories the percentage is higher. It is a matter of concern that the poorest who are hospitalized in Kerala are spending 19 percent of their total expenditure on inpatient medical care, the figures for the middle-income group is 16 percent, and for the poor group is 14 percent. The rich and the richest who are hospitalized spent a relatively lesser percentage on inpatient medical care. Comparing the figures for Kerala with that of India, it is seen that for the poorest, poor, and middle-income groups, the percent share is higher by 36 percent, 22 percent, and 38 percent in Kerala as compared to the national average. The social group-wise difference shows that for the general community who are hospitalized, there is a higher percentage share of their income being spent on inpatient medical expenditure- 21 percent, followed by the SC community and OBC community. For the ST community, the percentage share is only 2 percent pointing to the freely available medical services for them in Kerala. Sector-wise people who are hospitalized both in rural and urban areas incur a greater share of health expenditure as compared to the national level.

Table 3: Expenses incurred for inpatient medical care as a percent of household consumption expenditure in Kerala[8]

Particulars	India	Kerala	Percentage difference
Type of institution			
Public	2.5868	4.5724	76.76
Private	24.1607	20.9865	-13.14
Total	13.1587	14.8665	12.98

Education			
Illiterate	12.3188	9.1796	-25.48
Primary	12.5771	15.0478	19.64
Secondary	12.7583	16.3003	27.76
Higher Secondary	13.3619	14.7913	10.70
Graduate	18.5495	17.4691	-5.82
Total	13.1587	14.8665	12.98
MPCE			
Poorest	13.9684	19.0877	36.65
Poor	12.0499	14.7882	22.72
Middle	11.8723	16.4664	38.70
Rich	14.0562	13.3453	-5.06
Richest	14.3637	14.6858	2.24
Total	13.1587	14.8665	12.98
Social group			
Scheduled Tribes (ST)	8.9679	2.073	-76.88
Scheduled Castes (SC)	12.3138	13.1642	6.91
Other Backward Classes (OBC)	13.0234	12.3495	-5.17
Others	14.9821	21.4038	42.86
Total	13.1587	14.8665	12.98
Sector			
Rural	12.8486	14.1272	9.95
Urban	13.8198	15.943	15.36
Total	13.1587	14.8665	12.98

Catastrophic Headcount Ratio across Socio-Economic Categories in Kerala

Healthcare expenditure due to inpatient medical care is termed catastrophic if it exceeds ten percent of total household consumption expenditure. The percentage of people falling into the catastrophic group because of inpatient healthcare expenditure is given in table 4. On an average 32 percent of Indians who are hospitalized fall into the catastrophic group -the respective figure for Kerala is 34.70, thus Kerala reporting an increase of 7.43 percent compared to the national level. Comparison between groups shows that both in the rural and the urban sector, the percentage falling into the catastrophic health expenditure group is higher in Kerala compared to India. The headcount ratio of the poorest who are availing of inpatient care incurring catastrophic health expenditure in Kerala is very high – 44 percent followed by a 32 percent headcount ratio for the poor. In India, 31 percent of the poorest fall into the catastrophic health expenditure group – the percent increase is 41.5 percent in Kerala compared to India. The rich and richest incurring catastrophic health expenditure is less in Kerala as compared to the national average. However, the headcount ratio is high for both India and Kerala 31.2 and 34.8 percent for the rich and richest category in Kerala, against 33.3 and 37 percent for India. Regarding social groups even after the free inpatient care given, 10 percent of the ST community falls into the catastrophic group because of medical expenditure. The percentage share for other social groups who are incurring inpatient medical care falling under catastrophic health expenditure is very high - 28 percent for SC, 32 percent for OBC, and 42 percent for the general population. Another interesting figure is that 11.9 percent of the people who are availing of inpatient medical care in public hospitals fall into the catastrophic expenditure group in Kerala amidst the subsidized provision of medical care in public hospitals- the relative percent for India is 8.40. For private hospitals, 48.30 percent is the headcount ratio of the population who take inpatient medical care from private hospitals.

The catastrophic headcount ratio across the education group shows that the ratio increases as one moves from the illiterate group to the graduate level. Twenty percent of illiterates fall into catastrophe followed by 27 percent, 37 percent 54 percent, and 55 percent for the primary, secondary, higher secondary, and graduate levels. Comparison with India shows that the headcount ratio is high by around 19 percent for persons who have educational attainment of secondary and above.

Table 4: Catastrophic headcount ratio across socio-economic categories in Kerala[8]

	India		**Kerala**		
	Not Catastrophic	**Catastrophic**	**Not Catastrophic**	**Catastrophic**	**Percentage difference**
Sector					
Rural	68.60	31.40	66.30	33.70	7.32
Urban	65.70	34.30	63.90	36.10	5.25
Total	67.70	32.30	65.30	34.70	7.43
MPCE class					
Poorest	68.70	31.30	55.70	44.30	41.53
Poor	70.20	29.80	67.10	32.90	10.40
Average	67.90	32.10	61.50	38.50	19.94
Rich	66.70	33.30	68.80	31.20	-6.31
Richest	63.00	37.00	65.20	34.80	-5.95
Total	67.70	32.30	65.30	34.70	7.43

Social Group					
ST	78.70	21.30	89.30	10.70	-49.77
SC	71.90	28.10	71.40	28.60	1.78
OBC	67.10	32.90	67.70	32.30	-1.82
General	62.90	37.1	57.50	42.5	14.56
Total	67.70	32.30	65.30	34.7	7.43
Type of hospital					
Public	91.60	8.40	88.10	11.90	41.67
Private	42.70	57.30	51.70	48.30	-15.71
Total	67.70	32.3	65.30	34.70	7.43
Education Status					
Illiterate	68.50	31.50	79.80	20.20	-35.87
Primary	72.50	27.50	73.00	27.00	-1.82
Secondary	68.60	31.40	62.6	37.40	19.11
Higher Secondary	62.5	37.50	54.60	45.40	21.07
Graduate	54.40	45.60	45.00	55.00	20.61
Total	67.70	32.30	65.30	34.70	7.43

V DISCUSSION

The state of Kerala has been appreciated across the globe for the achievements in the social sector, particularly health, and education that she has achieved using low levels of resources. Kerala's achievements in health development, mainly in the indices of mortality and life expectancy have been at internationally comparable levels and have been achieved at low cost. This has earned a title for Kerala's health sector development as 'good health at low cost'. Kerala model of provision of health care services through decentralised structures has also received appreciation across the globe[10]. However, by the 1980s criticisms started emerging against the Kerala model of health, this was because many studies pointed out that even though mortality was low in Kerala morbidity was high. By the 1990s Kerala became the harbinger of many communicable and non-communicable diseases. Additionally, the cost of health care also started increasing, partly because of the growing number of private hospitals and beds[11] and partly because the public sector itself was under a process of internal privatization[12]. An increase in the prevalence of non-communicable diseases because of the epidemiological transition and a growing proportion of the population depending upon the private sector has led to a huge escalation of health care expenditure[13]. Inpatient medical care normally needs more finance since several components of direct expenditure including diagnostic tests, doctor's fees, room rent, etc are high compared to outpatient care. When health financing is not supported by pre-payment mechanisms like insurance, the individual needs to pay for treatment from his pocket. Analysis shows that out-of-pocket health expenditure in Kerala for inpatient medical care is very high in Kerala. This has implications for health expenditure becoming catastrophic and in Kerala, the out-of-pocket health expenditure due to inpatient medical care as a percent of total expenditure is obtained as 14 percent. Analysis shows that 34 percent of those who are receiving inpatient medical care in Kerala fall into the catastrophic expenditure category.

When health care becomes catastrophic the probability of people falling into poverty is very high. There are multiple pathways by which catastrophic health expenditure can result in pulling a household to the poverty level. One reason is that households may reduce the expenses earmarked for non-food consumption including housing, clothing, and educational expenses of children – these are expenses which once reduced will pass on poverty to the next generation. Additionally, the household may also reduce expenditure on food items which may increase the susceptibility to diseases of others in the household. Our results show that in Kerala 44 percent of the poorest group and 33 percent of the poor group who are hospitalized are incurring catastrophic expenditure. This requires the attention of the policymakers; these people are already in poverty and such a huge expenditure on inpatient medical care is sure to put these households in multiple crises. Even for the high-income groups catastrophic health count ratio of 35 percent implies that these people will fall into poverty because of this huge expenditure.

It is interesting to note that out of those who have availed of inpatient medical care from public hospitals, 12 percent are incurring catastrophic expenditure as against 8.4 percent at the national level. Public hospitals are non-profit hospitals that are hugely supported by the government to provide subsidized health care to the people. A significant amount of those who avail medical care from public hospitals belong to the lower socio-economic groups and a whopping 12 percent falling into poverty throws light into further inquiries into the reasons for the same and immediate interventions. Recognising these, the Government of Kerala has off late come up with 'Aardram Mission' to revitalise the public hospitals by provision of funding for both physical and human infrastructure at the public hospitals[14].

The high out-of-pocket health expenditure is indicative of the poor insurance coverage and social protection mechanisms that is available at the state and national level. Insurance schemes such as Rashtirya Swasthya Bhima Yojana, Karunya Health Insurance scheme etc. is operating in Kerala, however the study points

out that the existing coverage of insurance schemes is limited and requires immediate attention and policy interventions.

VI CONCLUSION

In conclusion, this research draws attention to the huge out-of-pocket expenses incurred by Keralites for inpatient medical care and to the severity of catastrophic health care expenditure. The study is a call for policy makers to design health insurance and coverage for the population so that they do not fall into poverty. Socially and economically backward population are primarily the category who have high catastrophic headcount ratio, this implies that policies adopted for universal health coverage should have targeted polices for these groups. It is striking to note that for many who are availing inpatient medical care from public sector hospitals, out-of-pocket expenditure has become catastrophic which has led to interventions by Government of Kerala to revitalise the sector.

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