

Original Research Article

# Out of Pocket Health Expenditure and Catastrophic Health Expenditure among the Beneficiaries of Comprehensive Health Insurance Scheme in Kerala

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## ABSTRACT

**Background:** Health insurance is considered as one of the mechanisms to ensure access to health care and a means of achieving universal health coverage. Within Indian context several government funded health insurance schemes were initiated. The current study assessed the out of pocket health expenditure (OOPE) and catastrophic health expenditure (CHE) among the beneficiaries of Comprehensive Health Insurance Scheme in Kerala.

**Methodology:** A cross sectional survey was done among 141 beneficiaries in Kasaragod district of Kerala. Households were interviewed with the post hospitalization interview schedule for the RSBY scheme with making necessary changes. OOPE and CHE were estimated using respective formulas. Bivariate analysis was used to identify the factors associated with OOPE and CHE. Simple linear regression and binary logistic regression was used to identify the impact of factors influencing OOPE and CHE respectively.

**Results:** The study results showed that 100% of the beneficiaries incurred OOPE and 76.6% of the beneficiaries incurred catastrophic health expenditure. Factors associated with CHE were transportation charges (OR=5.20, 95% CI 2.07-13.02), distance from the hospital (OR=4.82, 95% CI=1.73-13.44), bystander expenditure (OR = 4.67, 95% CI 1.78-12.21) and days of admission (OR = 2.79, 95% CI = 1.15-6.74). Factors associated with OOPE includes Type of disease (OR = 3.70, 95% CI 1.66- 8.23), distance from the hospital ( $r = 0.34$ ,  $p < 0.01$ ), Transport charges ( $r = 0.30$ ,  $p < 0.01$ ), Bystander expenditure ( $r = 0.20$ ,  $p < 0.01$ ) and Insured amount ( $r = 0.32$ ,  $p < 0.01$ ).

**Conclusion:** Though the scheme helped to improve the health care utilization, it provided limited protection against high health care costs and indirect expenditure. Public health system strengthening along with policy modifications within CHIS will help to improve it further.

**Key words:** Health Insurance, Universal Health Coverage, RSBY, CHIS, OOPE, CHE

## INTRODUCTION

High health care expenditures and out of pocket payments are some of predominant challenges the health systems face in providing accessible and affordable health care, often resulting in health inequities. [1] The out of pocket expenditures are high globally with a majority of their burden on the vulnerable population (Disabled, Elderly, Poor and Marginalized) living in low and middle income countries. In India, the out of pocket expenditure

(OOPE) account for over 68% of current health expenditure as per the recent estimates. [2] The high OOPE's often result in catastrophic health expenditure (CHE) either pushing the individuals and households in to poverty or preventing them from accessing health care. [3]

Universal Health Coverage (UHC) is advocated as a mechanism to ensure health equity i.e., to ensure equitable access to health care services to all the individuals. The United Nations Sustainable

Development goals to be achieved by 2030, advocates achieving universal health coverage as an important milestone to be accomplished under larger health goal. [4] Universal health coverage is considered as a powerful mechanism for achieving better health, promoting human development and enabling equitable access to the health services. In this regard, the whole idea of UHC rests on provision of full range of essential health services and financial risk protection to all the citizens of a country. In 2005 the WHO member states made the commitment to achieve Universal health coverage. [5]

Health insurance is one of the means of ensuring financial risk protection, a one half of the larger idea of UHC. It helps in protecting the poor from financial catastrophe. [6] The health insurance policies work with the central idea of the risk pooling of individuals through payment of insurance premiums prior to the episode of illness/hospitalization. [7] However, given that premiums are often high for majority of private health insurance policies, the government funded health insurance schemes stand out as an only possible alternative for vast majority of the population who cannot afford private ones.

Several developed countries and developing countries had designed their own insurance schemes as a move towards achieving UHC. In early 2000s several Indian states introduced government funded health insurance schemes namely Rajiv Aarogyashri, Yeshasvini and Rajiv Gandhi Jeevandhaye Arogya Yojana (RGJAY) paving way for the state funded health insurance programmes in Indian settings. In early 2008 the government of India launched a national level public funded health insurance scheme called Rashtriya Swasthya Bhima Yojana (RSBY) with a prime aim to of providing health insurance to Below poverty line (BPL) households and people from unorganized economic sector. [8] The primary objective of the scheme was to provide financial protection against CHE

and OOPE and to improve the access to quality health care.

Several states had tailor made RSBY according to their own health needs. The Government of Kerala extended the scheme by adding the Above Poverty Line (APL) households and relaunched it as Comprehensive Health Insurance scheme (CHIS). In addition to the normal intended coverage of INR 30000/- for inpatient hospitalization, the BPL families will get an additional amount of INR 70000 for treatment for Cancer, Cardiac ailments, Liver and Kidney related diseases, Neurological problems, Accident injuries and mental ailments in the selected hospitals. [9] For elderly who are having above 60 years additional INR 30000 were to be provided. A nodal agency called as Comprehensive Health Insurance Agency of Kerala (CHIAK) was created to oversee the implementation of CHIS in state of Kerala.

With a growing importance to UHC as a target to be achieved, several developing countries are shifting focus towards it by emphasizing on health insurance mechanisms. While countries like Thailand were able to successfully provide health coverage, India had made its move by announcing a National Health Protection Scheme (NHPS) with an annual cover of up to INR 500,000 per family covering over 500 million individuals in the country. [10] Considering the presence of a strong private health sector in India, the government funded health insurance schemes have scope to increase access to health care by making health care more affordable. However, the question rises if Health insurance schemes are able to do what they are intended to do i.e., protecting the people from OOPE and CHE. Studies of various insurance schemes inform that government funded insurance schemes in India had limited success in preventing OOPE and CHE. [11] Moreover, very few studies had actually captured OOPE and CHE among the beneficiaries of a government funded health insurance scheme. Given the context, the current study attempted to estimate OOPE and CHE

among the CHIS beneficiaries in Kasaragod district of Kerala state in India. Additionally, the study also aimed to identify primary cost drivers for OOPE and CHE among CHIS beneficiaries.

### Objectives of the study

1. To estimate the out of pocket expenditure for hospitalization among CHIS beneficiaries in Kasaragod district of Kerala.
2. To estimate the proportion of individuals falling under CHE among the CHIS beneficiaries in Kasaragod district of Kerala.
3. To identify the key cost drivers for OOPE among CHIS beneficiaries in Kasaragod district of Kerala.

### METHODS

**Study Design:** Considering the objectives, the study was carried out adopting a quantitative cross-section research design. The data pertaining to majority of the variables was captured at a single period of time through survey method.

**Study Setting:** The study was conducted in Kasaragod district of Kerala State in India. Kasaragod is considered as one of the under developed districts of the state of Kerala, with comparatively poor health infrastructure and health indicators. The district had around 8 public hospitals and 8 private hospitals which were empanelled under CHIS. The district was selected considering its lower HDI compared to other districts in Kerala and the logistic feasibility of the study.

**Sampling:** The study adhered to probability sampling in order to ensure representativeness in the sample. Multi-stage systemic random sampling was opted to sample a total of 141 CHIS beneficiaries from 3 empanelled hospitals in the district. All the individuals who had obtained the treatment under CHIS scheme from empanelled hospitals in the financial year April 1, 2016- 31<sup>st</sup> March, 2017 irrespective of the age/aliment were included in study.

**Data Collection:** The sampled beneficiaries were approached and the data was collected

by using structured interview method. A pre-validated questionnaire developed in earlier study on CHIS [12] which was used in the context of CHIS earlier was used as the tool after making necessary corrections.

**Data Analysis:** The data collected was quantitative in nature and the data analysis was done using univariate (Mean, Median, Frequencies and Percentage), Bivariate (Chi-square) and multivariate analysis (linear regression and binary Logistic regression). The Dummy variables were created wherever necessary to facilitate the analysis. Additionally, certain formulas were applied for developing the outcome variables of out of pocket expenditure (1) and catastrophic health expenditure (2). The former dependent variable was a continuous variable whereas the later one was a categorical variable with two categories. In order to understand the key cost drivers for OOPE linear regression was applied with OOPE as the dependent variable. The results of the same are reported in table 2. Binary logistic regression was conducted with CHE as the dependent variable the results of the same are provided in table 1.

Out of pocket expenditure = total cost of care – amount insured under CHIS -----(1)

Catastrophic Health Expenditure = OOPE > 10% of Annual Income ----- (2)

**Ethical Consideration:** The study strictly complied with the highest ethical standards for research involving human subjects. The study was approved by the Institutional Human Ethics Committee (IHEC) of Central University of Kerala, India with approval noCUK/IHEC/2017-007. The participants were provided full information about the study in local language (Malayalam) prior to the data collection. Additionally, informed consent was obtained from all the participants in the study. The participants were informed about their right to withdraw from the study at any point of time. The confidentiality of the participants was ensured by removing the

identifiers. The data security was maintained by limiting the access to the researchers (first author and second author) and storing the data in password protected computers.

## RESULTS

The study sample comprised of 141 individuals sampled across three CHIS empanelled hospitals in Kasaragod district, Kerala. The data was analysed in SPSS 20<sup>th</sup> version and was analyzed under 4 headings namely, Sociodemographic characteristics, CHIS factors, Health System factors and Individual factors.

### Socio demographic characteristics

The sample comprised of 44 males and 97 females comprising for 31.2 percent and 68.8 percent of the sample respectively. Majority of the respondents were under BPL category (75 percent). 72.3% of them were unemployed. A household covered under CHIS on average had five individuals with a standard deviation of  $\pm 1.8$ . The mean reported annual household income of the families was INR 6044.43.

### CHIS factors

The percentage of beneficiaries used rented vehicles as their mode of transport was 58.7%. It was found that 26.2% of the beneficiaries took medical aids out of the hospital and paid from their own pocket. Results showed that 91.9% of the hospital staff explained they didn't have the facility. 51.3% of beneficiaries paid for medicines and 29.7 percent of them paid for both doctor fee and medicines. The mean cost of transport per hospitalization was reported to be INR 370. The mean bystander expense per hospitalization was found to be INR 731. The average number of days of hospitalization per episode was 6 days.

### Health system factors

The mean distance from the home to the hospital was found to be 15 KM. The mean fee that was given to the doctor even after being covered under CHIS was INR 6308. The mean rupees spent to buy medicine per hospitalization was INR 902 and for diagnostic test was INR 715..

## OOPE

Despite having an insurance scheme 100% of the beneficiaries incurred OOPE for their hospitalization with mean OOPE of INR 1787.48. The mean percentage of OOPE to the total health expenditure when calculated was found to be 25.56. Since OOPE was calculated as a continuous variable and majority of the independent variables are categorical. For the ease of analysis OOPE was made in to two categories by taking the median OOPE as higher and lesser expenditure. So analysis was done with continuous OOPE and Categorical OOPE. When correlates were assessed for the outcome variable Out of pocket expenditure: Distance from the hospital ( $r = 0.34$ ,  $p = < 0.01$ ), Transport charges ( $r = 0.30$ ,  $p = < 0.01$ ), Bystander expenditure ( $r = 0.20$ ,  $p = < 0.01$ ) and Insured amount ( $r = 0.32$ ,  $p = < 0.01$ ) were found to be significant. Type of disease (OR 3.70, CI 1.66-8.23) was also associated with OOPE.

## CHE

Among study participants 76.6 percent of them incurred catastrophic health expenditure even having a cashless insurance scheme and 23.4 percent of them didn't incurred catastrophic health expenses. When association was looked for CHE and all other factors Transportation expenses (OR 5.20, CI 2.07-13.02), distance from the hospital (OR 4.82, CI 1.73-13.44), Bystanders expense (OR 4.67, CI 1.78-12.21) and days of admission (OR 2.79, CI 1.15-6.74) were found significant.

Variables	OR	95% CI	p-value
Distance from the hospital			
<15 km(Ref)	1		
>15 km	3.46	1.092-11.01	0.03
Transport charges			
Lesser charges(Ref)	1		
Higher charges	1.77	0.66-5.063	0.28
Type of treatment			
Surgical	2.30	0.80-6.58	0.1
Non surgical(Ref)	1		

**Table 2 Table reporting the primary cost drivers for OOPE**  
 Constant  $b_0 = 576.948, t = 3.306, r^2 = 0.987$

Variables	b value	t value	p-value
Insured money	0.048	2.067	0.04
Total cost incurred for medical aids	0.958	41.099	0.00
Cost of transport	0.959	3.806	0.01

When linear regression was done with OOPE as dependent variable and independent variables such as insured money, transport charges and cost of medical aids it showed significant results ( $r^2 = 0.987$ ). Cost of transport had more influence (0.959) over OOPE ( $b_0 = 576.948, t = 3.306, r^2 = 0.987$ ) it can be further explained that when there is one rupee increase in the transport charge the OOPE increases by  $576.948 + 0.959$ . Then for medical aids (0.958) and for insured amount had least impact over OOPE (0.48).

## DISCUSSION

The current study showed that despite having an insurance scheme, beneficiaries continued to spend from their own pockets. Similarly when catastrophic health expenditure was assessed for the beneficiaries it showed 76.6% of them spent more than 10 % of their annual income towards the health. In line with our results, several studies done on different insurance scheme showed that beneficiaries incurred OOPE and CHE though they were of varying degrees and proportions. [3,11,13-15]

Overall the study results showed that the CHIS scheme, a variant of RSBY had a little effect in providing complete financial protection to its beneficiaries. The plausible reason behind the limited success of the scheme could be explained with respect to several factors which could be patient specific, health system specific and insurance scheme specific. Specific to this study the key factors which were identified to be influencing OOPE and CHE among CHIS beneficiaries were with respect to indirect costs of bystander's expenses, and direct costs for purchase of medical aids, transport charges, and the disease/health

aliment which the individual is suffering from.

Bystanders expenses are one of the key indirect costs of illness which a household suffers due to hospitalization. [16] Though bystander expenses are not directly associated with the hospital costs of the patient, they have a significant impact on the overall costs incurred by the household while accessing the health care and impact the ability of the household to access the health care further. Similar kind of association of bystander expenditure with OOPE was found in the other studies. [17,18] However, the debates concerning health insurance pay a little attention towards bystanders expenses compared to the other factors influencing OOPE ignoring its larger impact on the household's ability to pay for health care. Bystanders expenses along with the loss of income of patient make up one of the core reasons reducing the household's ability to pay for health care. Moreover, studies identify bystanders expenses as an important component of Non-medical expenditure which increased OOPE even in government funded insurance schemes such as RSBY. [19] Additionally, it also has to be noted that these bystanders costs are comparatively high among the chronic diseases which require multiple hospitalizations/longer duration of care. In this regard the means of tackling the indirect costs of health care has to be constituted to ensure better financial risk protection for individuals. Social security measures for households with sick individuals particularly those who are chronically ill, aged, disabled or requiring a continuous need of care would provide a greater financial risk protection to the disadvantaged groups.

Another most important factor influencing out of pocket expenditure and CHE was concerning the payments made towards medical aids (including purchase of medicines, informal fees paid to doctors, diagnostic test). The mean expense borne by the beneficiaries for purchasing medical aids was measured to be INR 2995.11.

Within this the informal fee which are given to the doctor as doctor fee for conducting surgeries was reported to be one of the primary ones. There are similar reports of informal fee paid by the beneficiaries of health insurance schemes from other developing nations. [20,21] In addition to the above, Medicines, and diagnostic tests also contributed for beneficiaries to incur OOPE though they were covered by CHIS. Such out of scheme purchase of health services contributing for OOPE was evident in other studies. [3,22-24] The primary reasons the beneficiaries are forced to pay such additional charges towards medical aids are due to the lack of proper facilities at the empanelled hospitals (particularly government hospitals), lack of medicines in the hospital and unawareness of the beneficiaries regarding the scheme. The former two reasons call for health system strengthening for efficient functioning of any government funded health insurance programme. Keeping in place adequate regulatory mechanisms, establishing beneficiary helplines and using community health workers could be additional measures to improve the awareness among the people.

The transport charges were one of the factors which were identified to be impacting OOPE. In the present study identified a significant association between transport charges and OOPE. A similar kind of association was found for the distance to the health facility and OOPE. This could be translated in the aspects of the distance and the accessibility of the health services. With an increasing distance the charge paid towards transportation costs are also high, warranting the need to focus more on the factor of transportation in order to improve accessibility of health services. Though CHIS provides reimbursement of transport charges, the maximum amount reimbursed is INR 100, per episode of hospitalization. [9] However, the amount reimbursed for transportation is nowhere compared to what the beneficiaries pay towards transportation costs for private vehicles (Auto Rickshaw, Private Car, Rented Ambulance etc). While

the government provided ambulance services as 108 services, these are often inadequate and not timely. [25]

Out of pocket expenditure (OOPE) and Catastrophic Health Expenditure (CHE) are the two adverse outcomes which majority of the government funded health insurance schemes aim to reduce if not prevent. The Comprehensive Health Insurance Scheme (CHIS) of Kerala, was launched with a similar objective. After around a decade of its implementation, from the results of the current study it is identified that CHIS had a limited success in terms of preventing the beneficiaries from financial distress i.e., from OOPE and CHE. The study indicates that though the scheme had some success in terms of reducing the amount paid by the beneficiaries towards accessing health care, yet OOPE and CHE still existed. Although the term cashless insurance scheme attracts the beneficiaries' evidence indicates that it has limited success in preventing the prevalence of OOPE. This is due to limited financial coverage provided under the scheme which stands at 30000 per family per year. Furthermore, the scheme was inclined towards inpatient care whereas a considerable proportion of populations incur OOPE in accessing health care for outpatient care. Extending the coverage to outpatient care including primary and secondary health care services will improve the efficiency of the scheme. The challenges within the health system i.e., non-availability of the services, issues with the accessibility of health services were identified to be impacting the success of the scheme. Hence, implementation of insurance schemes should go hand in hand with health system strengthening. While it is essential to extend the coverage of the scheme in terms of the services provided, financial protection provided and population covered, it is also essential to invest in the existing resources within the health system and strengthening them without which the insurance scheme might not function to the optimum.

**Novelty of the Study:**

Though health insurance schemes are universal, they are unique in policy and implementation with respect to the country or the state they are implemented in. The current study assessed the OOPE and CHE among the CHIS beneficiaries in Kerala and identified the primary cost drivers for OOPE among CHIS beneficiaries. Though there were studies on insurance schemes like aarogyasri, RSBY etc., there were limited studies on CHIS of Kerala. While earlier studies compared the OOPE between those who were covered under CHIS and those who were not covered, the current study focussed only on beneficiaries and assesses the OOPE only among those who have utilized CHIS benefit for hospitalization. This provides a more accurate picture of effectiveness of the scheme in terms of preventing OOPE. Besides, the study also calculated the proportion of beneficiaries facing CHE which none of the earlier studies on CHIS had captured.

#### **Strengths and Limitations:**

*Strengths:* The current study provides empirical evidence on OOPE and CHE among the beneficiaries of CHIS scheme of Kerala. The major strength of the study lies in the methodological underpinnings which the study had adopted to achieve its objectives. Additionally, the proposed study is one of the very few studies which estimated catastrophic health expenditure among the beneficiaries of an insurance scheme.

*Limitations:* Given the cross sectional nature of the study, the study has all the limitations associated with cross sectional design. Moreover, the participants reported the income of their ration card which to a greater extent might not be a true estimate, and is one of the major challenges in studies studying income and expenditure details in the population.

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**Conflict of interest:** None declared

#### **Author Contributions:**

NN developed research questions and objectives, designed the study, conducted data collection and data analysis and developed the initial draft of the study. PBK guided NN to do the study particularly in the matters of designing the study, developing methodology, correcting the initial versions and drafting the final version of the manuscript.

#### **Recommendations**

From the policy perspective timely monitoring and evaluation can improve the scheme. Increasing the ceiling for the amount of insurance coverage and including measures to prevent non-medical expenditures such as bystander expenditure and high transportation costs might help in protecting the people from the financial risk. Given that indirect costs contribute considerably towards OOPE and CHE, mechanisms to minimize the indirect costs to beneficiaries might be considered. Providing awareness for the beneficiaries inside the hospitals through special health desks and will help the beneficiaries in efficiently using the scheme.

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