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Out Of Pocket (OOP) Health Expenditure and Utilization of Financial Risk Protection Measures Among COVID-19 Affected Individuals in Chennai- A Cross-Sectional Study

Swetha NB[1], Angeline Grace[2], Sujitha P[3], Umadevi R[4]

[1]Sree Balaji Medical College & Hospital, Chennai, India
[2]Sree Balaji Medical College & Hospital, Chennai, India
[3]Sree Balaji Medical College & Hospital, Chennai, India
[4]Sree Balaji Medical College & Hospital, Chennai, India

ABSTRACT

Background: Pandemic has affected people physically, mentally and economically. India being a growing economic power house, spends only around 1.2% of GDP on health which thereby leads to high OOP spending. This study aims to estimate out of pocket health expenditure and proportion of financial risk protection.

Methods: Cross sectional study conducted among Covid-19 affected individuals in Chennai. It was a questionnaire-based study with questions about covid-19 management status, cost and insurance utilization. Descriptive statistics and regression analysis was used for analysis.

Results: Total of 47 were treated at hospital and 85% of them were treated at private hospital. The mean cost investigations for patients treated at hospital was of Rs. 50000+11547 and for medicines was Rs. 110000+57735. 53% of study participants had health insurance. 29 (54.72%) of them had Covid-19 treatment cost covered under insurance. The multiple regression analysis showed a statistically significant association between total OOPE incurred and age, religion and socio-economic status.

Conclusion: Majority of participants spent for their treatment through savings and borrowing money. OOPE was compensated by reimbursement through health insurance. Provision of quality health care in government hospitals, increase public health spending and creating awareness about health insurance are ways to reduce OOP costs.

Key words: Public health spending, Health insurance, Private hospital, Direct cost

INTRODUCTION

Coronavirus disease (COVID-19) has affected not only physical health, but also mental, economic and social health of people. It has also revealed how unprepared our health care system is to handle such unprecedented events.[1] Indian health care system was not able to cope with the increasing demand of health care supplies and weak public health system. With increase in number of cases and non-availability of beds in public sector, more patients were forced to seek care at private facilities. India a country which spends around 1.2% of Gross Domestic Product. GDP on health and India's health system ranks as one of the most heavily dependent on out-of-pocket expenditure (OOPE) in the world.[2] Out of pocket medical expenses make up about 62% of all healthcare costs in India. Public health spending has declined from last two decades and is stagnated at 1.3% of GDP in central budget and declined from *7.0%* to 5.5.% of State health Budget.[3] The National

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Correspondence: Dr. Swetha NB (Email: swethanb@gmail.com)

Health Policy 2017 estimated that 7% of the Indian population is pushed into poverty each year because they are not able to afford the OOP costs.[4] OOP health expenditure imposed an extreme financial burden on households.[5] Hence many people were impoverished or ended up in debts.

The Government to introduce financial packages for infrastructure improvement and procuring medical supplies. A stimulus package at 0.8% of GDP was announced on 26 March 2020 which included cash transfer to lower income households, insurance coverage of healthcare workers and financial support to low wage workers and others seeking jobs.[6] By March 2020, State Disaster Response Fund (SDRF), under the Disaster Management Act, has recognized COVID-19 as a national calamity and released 25% of its funds for screening, contact tracing, clothing, shelter with the National Health. SDRF has also provided 10% funds for strengthening laboratory and surveillance.[7] During COVID-19, health insurance business is facing higher hazards. For below poverty line cases, COVID-19 positive individuals were to be covered under Ayushmann Bharat Health Insurance Scheme, a central government scheme. People having a health insurance policy prior to the pandemic, were already covered for claims related to Coronavirus disease. But, in India, as of 2018, 500 million people did not have any form of health insurance coverage.[8] There are many research studies which are undertaken to study the impact of Covid-19 on physical, mental and social health; but very few studies pertaining to economic impact of Covid-19. And of these economic impact studies most of them are based on the impact of Covid-19 on Indian economy and only a few are on individual basis. With this background this study aimed to determine OOP expenses towards Covid-19 treatment and also the proportion of patients who utilized financial risk protection mechanisms to bear the cost of treatment.

MATERIALS AND METHODS

Study Design, Study Area and Study Population: This was a Cross sectional study conducted by an online survey among Covid-19 affected individuals in Chennai, Tamil Nadu between September 2021 to February 2022.

Inclusion Criteria: Covid-19 affected individuals in Chennai and willing to participate in the study. All who were treated at home, Covid care centers and Private and public hospitals and with all grades of disease were included in the study. Parents of covid-19 affected children were included

Exclusion Criteria: Patients who were suffering from Covid-19 and recieving treatment during data collection; and who were not able to fill the online questionnaire (google form questionnaire) were excluded from the study.

Study Sample Size: Based on article Kotwani P et al.,[9] the median cost was found to be 100. With the help of software, the minimum sample size was calculated to be 100 using the formula Sample size(**n**) $=Z^2_{1-\alpha/2}$ (Md)/d^2 Where $Z^2_{1-\alpha/2}$ is 95% level of confidence; *Md* stands for Median difference and *d* is expected error margin

Study Tool, Sampling Method, and Data Collection Methods: Study was conducted by online survey among Covid-19 affected individuals in Chennai, Tamil Nadu. Purposive sampling method was followed. Data collection was started after obtaining clearance from Institutional ethics committee. Informed consent was obtained before data collection was initiated. The study tool was a pretested semi-structured questionnaire which was distributed as google forms with a consent form added to it. The questionnaire was consisting of questions about sociodemographic details, covid-19 management status, cost (direct & indirect cost incurred) and details regarding insurance utilization. Direct cost includes money spent for admission, diagnostics, medicines, and other Interventions during treatment. Indirect cost includes money spent on food, loss of wages, transportation expenses and lodging expenses for family members. Data was collected through an online platform due to pandemic situations to avoid the spread of infection. Questionnaire link was sent through WhatsApp, Email and other media to contact the participants. Data collection was carried out during the first three months of study period and responses from all respondents who were eligible based on inclusion criteria were considered for analysis.

Statistical Analysis: Data will be entered in Microsoft excel and analyzed using SPSS version 21. Descriptive statistics like mean and standard deviation, frequencies will be used to analyse OOPE costs. Regression analysis was used for analysis for other associated factors. Socio-economic class was calculated based on modified Kuppuswamy scale updated for year 2021.[10] P value <0.05 was considered statistically significant at 95% confidence interval.

RESULTS

Socio- demographic profile, Covid-19 management details and OOPE of study participants: Table 1 depicts the socio-demographic details of the study participants. Out of 100 participants majority were in 21-40 years age group followed by 41-60 years. Majority of study participants were males (71) and belonged to Hindu religion. Most of study participants were married and were graduates. 50% of participants belonged to upper and 30% to upper middle class according to modified Kuppuswamy scale. Approximately half of the participants had undergone both RTPCR test and CT scan for diagnosis (48). CT severity score was 9-15 among 13 (25%) of participants who underwent CT scan chest and score was > or = 16 in 11 (21.15%) participants.

Table 1: Covid-19 treatment OOPE according to Socio-demographic details and treatment profile of study participants

Parameter	Number	Total cost (Mean+SD) (INR)
Age in Years(n=100)		
</=20	3	13166 +1443
21-40	39	93208 +178058
41-60	35	167842 + 272737
61-80	21	482142 +470426
>80	2	311000+175362
Gender(n=100)		
Male	71	230239 +366144
Female	29	136175 +179811
Religion(n=100)		
Hindu	90	193645+ 326184
Christian	8	166000+ 220630
Others	2	
SE status (Modified Kuppuswamy scale) (n=100)		
Upper class	0	
Upper middle	50	147268+ 228192
Lower middle	31	227873 +329350
Upper lower	8	121827+181862
Lower	9	511111 +646795
Treatment from (n=100)		
Home/Covid CC	53	30086 +47291
Hospital	37	441081 + 414465
Both	10	238150 +230244
Type of Hospital (n=47)		
Private	40 (85.1%)	424162 +399210
Government	6 (12.8%)	216666 + 329849
Both	1 (2.1%)	
Admission (n=47)		
Ward	34 (72.3%)	244867+ 204356
Both ward & ICU	13 (27.7%)	798153+ 476832
Health Insurance (n=47)		
Yes	27	520462+ 454953
No	20	232450+ 185080

C= Care centre; SE status= Socio-economic status

Table 2: OOPE Incurred due to Covid-19 infection treatment

Type of Cost & Cost heads	Mean +SD (INR)	95% CI
Treatment at home /CCC (n=63)		
Direct Cost		
Investigations	3325.71+2275	2752.64 - 3898.79
Medicines	4138+7168.75	2332.67 - 5943.52
Indirect Cost		
Loss of wages	8190.48+ 13062	4900.69 - 11480
Transport	268.25+ 180.34	222.83 - 313.67
Treatment at hospital (n=47)		
Direct Cost		
Ward/da	11500+12124.36	7792.56 - 30792.56
ICU/day	36000+39259.81	26471.13 - 98471.13
Investigations	50000+11547	31626.14 - 68373.86
Medicines	110000+57735	18130.69 - 201869
Ventilator	53000+3464	47487.84 - 58512.16
Indirect Cost		
Loss of wages	22500+2886.75	17906.53 - 27093.47
Transport	8000 +4618.8	650.46 - 15349.54
Lodging	18000+11547	373.86 - 36373.86
Food	3750+866	2371.96 - 5128.04

Total of 47 participants were treated at hospital and around 85% were treated at private hospital. Out of 47 patients who were treated at hospital 34 (72.34%) were admitted in ward and 13 (27.66%) in both ward and ICU. 7 participants were put on ventilator during admission. The mean number of days of hospitalization in the ward was 7.50 + 0.58 (6.58 - 8.42) and in ICU was 3 + 1.16 (1.16 -4.84). Table 1 also gives the total mean cost of treatment for each variable. Mean OOPE was more for participants in the age group >40 years. It was also slightly higher among males and also participants in middle and upper lower group of socioeconomic scale. Mean OOPE was higher among those treated at private hospital and who were admitted in both ward and ICU. Mean total OOPE was higher among those who had health insurance.

Out of Pocket Health Expenditure (OOPE) incurred for Covid-19 treatment: Table 2 depicts the OOPE incurred for Covid-19 treatment among study participants. Due to wide variation in the cost of treatment the standard deviation is high value. The mean value INR of loss of wage was more than the direct cost for patients treated at home. The mean cost of ward stay/ day was Rs. 11500+12124.356. The mean cost investigations for patients treated at hospital was of Rs. 50000+11547 and for medicines was Rs. 110000+57735. Among indirect cost more amount was spent on lodging (Rs. 18000+11547) and loss of wage (Rs. 22500+2886.75). Table 3 shows the details of financial risk protection against OOPE incurred due to COVID-19 treatment. 53% of study participants had health insurance and majority being private health insurance (90.57%). 29 (54.72%) of 53 participants had their Covid-19 treatment cost covered under insurance. 29 (61.7%) of 47 patients who were hospitalized had their treatment cost covered under health insurance. 85% of direct treatment cost was reimbursed by health insurance. Reimbursement was the major mode of payment for insurance claim. The multiple regression analysis (Table 4) showed a statistically significant association in total Out of Pocket Expenditure incurred due to COVID 19 treatment with age, religion and socio-economic status. Younger age group (<50 years) showed higher OOPE than older group. Upper and middle class experienced higher OOPE than lower socioeconomic class as most of the upper class availed health care from private hospitals.

DISCUSSION

In India health care financing is by both public and private sectors. Private sector forms around 72% of health care financing and constitutes private providers, non-government organizations and majority by Out of -Pocket expenditure. India has one of the highest OOPE which is estimated to be 72% and it is three times more than the public health care financing. With the pandemic situation people were forced to avail health care in private sectors, which led to

Table 3: Details of Financial risk protection against OOPE incurred due to COVID 19 treatment

Parameter	Patients (%)
Health Insurance (n=100)	
Yes	53
No	47
Type of Health Insurance (n=53)	
Government	5 (9.43)
Private	48 (90.57)
Insured before Covid-19 pandemic started (n=53)	
Yes	47 (88.68)
No	6 (11.32)
Covid treatment costs covered under insurance (n=53)	
Yes	29 (54.72)
No	24 (45.28)
Claimed amount given as (n=29)	
Cashless treatment	4 (13.8)
Reimbursement	25 (86.2)
Sources of finance for treatment (n=100) *	
Savings	69
Debts	21
Others	14

*Multiple responses considered

Table 4: Multiple Regression analysis- Predictors of Total Out of Pocket Expenditure incurred due to COVID-19 treatment

Variable	B	P	95% CI
Age	176691.48	.000**	114754- 238628
Gender	-102871.5	.092	-223032- 17289
Religion	207674.23	.004**	67028- 348319
TFI	142583.12	.017*	26063- 259102
SE status	292028.01	.002**	111568- 472487

Model summary: R=0.599, R^2= 0.358, F=10.499, P= 0.000; *P<0.05, **P<0.01, CI- Confidence Interval, SE- Socio-economic, TFI -Total Family Income

more OOPE and they were pushed to loss of assets and savings and also had led to indebtedness in many. [11] Some protection against OOPE was obtained from risk pooling initiatives for sharing costs among the healthy and the sick like insurance schemes which acted as a substitution or as a supplement in maintaining equity in provision of health care.[3]

In our study 85% of study participants availed treatment services from private hospital and had incurred high OOPE. The results show a wide confidence interval and high standard deviation in OOPE due to wide variability in the data as each private hospital differed in the cost of health care provided by them. In a study by Kotwani P et al.[9] the mean total OOPE for the patient admitted in Covid Care Centre (CCC) was INR 11,333.07 (±31,707) which was similar to our study where mean total OOPE in home/ CCC was INR 13,506 (±18910). The mean total OOPE for ICU admission was INR 27,374.17 (±54,205.72) which was contrary to our study where it was INR 65789 (±89543). This variation may be due to difference in health care cost of private tertiary care hospitals in Northern and Southern part of India. We were not able to find other studies to compare the mean total OOPE in pandemic situation. In our study major OOPE was as direct cost and major contributor in total OOPE were medicines, investigations and ward stay which is similar to a study done in chronic illness patients by Swetha N B et al. where 56.09% of the direct cost was found to be spent on drugs and 26.16 % on investigations.[5] 21% of our study participants paid for treatment by source of debts which would make them experience catastrophic health expenditure and impoverish them. In a study done in chronic illness patients by Swetha N B et al. [5] prevalence of catastrophic health expenditure was 14.86% (48 households) and major source of health expenses was from earnings and savings. Similarly, a study by Rehman et al. also showed that 86% of the study participants had borne OOPE by borrowing money (42%); or by selling their household belongings (23%). [12] A Study by Balasubramanian et al. showed that almost 59% of the patients paid for the healthcare from their income or savings.[13]

Health insurance affects total OOPE through mechanisms: 1. Lower OOPE of service and 2. Increased utilization of health services.[14] In our study 53% had one or the other form of health insurance. Out of these 53, Covid-19 treatment was covered for 29 (54.72%) study participants. According to an article in Hindu, people who were covered under health insurance before pandemic, were eligible for reimbursement for claims related to hospitalization costs and the medical expenses incurred during the treatment and also medical expenses incurred during the quarantine period.[15] Only 6 (11.32%) of study participants bought health insurance during Covid-19 pandemic in our study which is contrary to the statement in Economic times, according to which there was 30% increase in purchase of online health insurance during pandemic.[16]

Our study was one among very few studies which tried to study the financial impact of Covid-19 pandemic in the community. Majority of study participants availed health care from private hospitals and incurred very high OOPE towards direct cost which was majorly contributed by medicines, investigations and ward cost. But some of these expenses was reimbursed as many of them had health insurance. Among indirect cost loss of wages was a major contributor and this loss could not be compensated. Limitation of this study was that it was a cross-sectional study without any follow-up component and low sample size. Scope of further research would be to estimate catastrophic health expenditure.

CONCLUSION

Our study concludes that out of Pocket health expenses due to Covid-19 treatment put a major financial burden on the patients. Many study participants had taken treatment in Private hospitals due to quality services available there. This had resulted in high OOPE among them. Few of them also had to forego

their savings and some had even end up in debts. For few study participants, part of the treatment cost was covered under health insurance and was reimbursed.

Direct health cost of the patients can be reduced by standardizing treatment cost in all hospitals and also by promotion of health insurance.

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