

National sample surveys show poor households face catastrophic expenditure for oral healthcare services in India

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ABSTRACT

Introduction: Globally people pay out-of-pocket (OOP) to access Oral healthcare services. In India, there is limited evidence on estimates of OOP expenditure. We undertook an analysis of national sample survey data on household health care expenditure to understand the expenditure pattern for Oral healthcare services and the catastrophic burden. **Method:** The expenditure reported for Oral healthcare services from two surveys: 71st round and 75th round, published by National Sample Survey Office (NSSO) was extracted. Based on monthly household consumption expenditure three economic groups were made: poor, middle- and rich-income groups. The OOP expenditure pattern while accessing day-care services and hospitalization and in public and private sector and the catastrophic expenditure were analysed. **Results:** A total of 204 and 155 households from two national surveys reported to have accessed day-care Oral services respectively. The median OOP expenditure in public sector remained same at US \$ 4 in both surveys. Over 35% of 78 households in 71st round and 42% of 167 in 75th round used public sector hospitalization services. The median expenditure of hospitalization doubled from US\$ 58 (IQR 21–263) in 71st round to US \$ 125 (IQR 45–363) in 75th round. Households from poor income groups spent seven times more for Oral healthcare services during the recent survey and faced catastrophic expenditure. **Conclusion:** The OOP expenditure for Oral healthcare has significant catastrophic household expenditure among the poor. There is a need to increase investment in public sector and insurance to protect poor against hospitalization expenditure in private sector.

Keywords: Catastrophe, healthcare expenditure, oral healthcare, out of pocket

Introduction

Oral diseases have affected more than half of the World's population and this pertinent issue has received less importance

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globally.^[1] The epidemiological survey in India has shown one-eighth of the population suffering from at-least of the oral health problem/s (e.g. Caries).^[2] An estimated 75% of people access private healthcare services for treatment of Oral health problem/s and majority of them pay out-of-pocket (OOP) to the service provider.^[3] The cost of treating Oral health problem/s has been estimated to be at US\$ 544 billion globally and the per-capita public expenditures are highest among developed countries.^[4] In India, the average per-capita

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expenditure is estimated at US\$ 0.14 which is one of the lowest when compared to developed countries.^[5] These estimates may have limitations for developing country as large proportion of population access private sector where the fee-for-services are met through OOP. OOP expenditure could have an impact on household income and pattern of expenditure and this may lead to catastrophe. The study by Masood *et al.*, showed that the proportion of households incurring catastrophic dental health expenditure (CDHE) ranged from 0.1% in Namibia and Lao to 6.8% in Ukraine.^[6] The estimates for India were also arrived using the same methodology (i.e., 0.6%) and this might be an underestimate, in the absence of critical information on total OOP expenses in public and private health sector (including direct/indirect costs). In this paper, we analyse the household OOP expenditure pattern for Oral healthcare services among different income groups while accessing services in public and private sector and the catastrophic expenditure thereof comparing two nationally representative sample survey data.

Method

The study used secondary data sets of household consumption expenditure on healthcare titled as “Social Consumption - Health Survey: NSS 71st Round, January - June 2014”, and “Social Consumption in India – Health: NSS 75th Round, July 2017-June 2018”.^[7] These are periodic surveys commissioned by government of India through the National Sample Survey Office (NSSO) with similar methodology for data collection and interview process.^[8] The data sets of 71st round and 75th round was published in year 2016 and 2019, respectively. The expenditure is broadly classified into two categories, (a) any expenditure reported in the last 15 days without hospitalization was considered as day-care and, (b) any expenditure reported for hospitalization in the last 365 days was considered as “hospital expenditure”. The survey collected details of expenditure across 333,104 persons from 65932 households in 71st round survey and 555,115 persons from 113,823 households. A subset of the survey data where households reported to have incurred expenditure (drugs, doctor consultation fee, diagnostics, other medical costs and indirect costs) for accessing Oral healthcare services is considered for analysis.

Data analysis: The study population is divided into three income groups based on monthly per capita consumption expenditure (MPCE) by households available in data sets. The OOP expenditure (direct and indirect expenditure) and the proportion of catastrophic expenditure, both for day-care consultation and hospitalization were computed across income groups and type of health care provider (public and private). We used the definition of catastrophic expenditure, when the total expenditure for care exceeded 20% of annual consumption expenditure (monthly expenditure was annualized).^[9] We used SPSS 16.0 software for the data analysis.

Ethical approval: The database is published by government of India and the data sets are available in public domain.^[7] The

Ethics Advisory Group (EAG) of The International Union Against Tuberculosis and Lung Disease (The Union), Paris, France reviewed the application and waived the ethical approval.

Results

A total of 204 respondents from households in 71st round and 155 in 75th round surveys, reported to have accessed day-care Oral healthcare services. Out of them 25% and 28% accessed public health sector in 71st and 75th round respectively. Similarly, 35% of 78 participants in 71st round and 42% of 167 in 75th round surveys used public sector hospitalization services. In both surveys 13% and 17% of participants had >7 days of hospitalization [Table 1]. Among the survey sample households who accessed Oral healthcare services for both day-care and hospitalization, one quarter were from poor income group, one third were from middle-income group and two-fifth were from rich income group. Among households from poor income group 63% in 71st round and 71% in 75th round surveys accessed private sector for day-care. Similarly, for hospitalization, 58% of poor in 71st and 49% in 75th round surveys accessed private sector.

Expenditure pattern for day-care services

The median expenditure reported for day-care services was at US\$ 7 (3-13) and US \$ 5 (4-14), in 71st round and 75th round surveys respectively. The median expenditure in public sector remained same at US \$ 4 in both surveys and had decreased in private sector from US \$ 8 to US\$ 7 [Table 2]. The rich income group spent more on day-care services in public sector (71st round US \$ 34 (IQR 2-39) & 75th round US \$ 75 (IQR 2–75)) than in private sector ((71st round US \$ 10 (IQR 5-12) & 75th round US \$ 11 (IQR 5-14)). From both the rounds poor spent US \$ 4 while Oral healthcare services were utilised in public sector.

The rich to poor ratio has reduced in the recent surveys; with poor, and rich income groups reporting similar expenditure pattern for using the Oral healthcare services. The ratio is skewed towards poor in recent survey and this was evident for expenditure in private sector. However, expenditure in public sector showed reduction in the ratio.

Expenditure pattern for hospitalization care

The median expenditure of hospitalization has doubled from US\$ 58 (21–263) in 71st round to US\$ 125 (45–363) in 75th round surveys. Moreover, the 75th round showed an increase of 40% for hospitalization in public and 20% increase in private sector when compared to previous survey. The overall expenditure on medical and non-medical doubled in the 75th round survey. Households from poor income groups spent seven times more for Oral healthcare services during the recent survey. In addition, the recent survey showed decrease of 20% and 40% OOP for hospitalization among Middle- and Rich-income groups respectively [Table 3].

Table 1: Profile of sample accessing oral healthcare services in public and private sector across 71st and 75th round of NSS

Characteristics	71		75	
	Day-care services or Out Patient department (n=245)*	Hospitalization or In-patient care services (n=78)	Day-care services or Out Patient department (n=175)**	Hospitalization or In-patient care services (n=167)
Age				
0-20	59 (24%)	27 (35%)	34 (19%)	45 (27%)
21-40	78 (32%)	18 (23%)	62 (35%)	55 (33%)
41-60	79 (32%)	21 (27%)	56 (32%)	51 (30%)
>60	29 (12%)	12 (15%)	23 (13%)	16 (10%)
Duration of Hospitalization				
<7 days	NA	68 (87%)	NA	139 (83%)
>7 days	NA	10 (13%)	NA	28 (17%)
Level of care				
Public	51 (25%)	27 (35%)	44 (28%)	70 (42%)
Private	153 (75%)	51 (65%)	111 (72%)	97 (58%)
Income group				
Poor	68 (28%)	19 (24%)	44 (25%)	39 (23%)
Middle	76 (31%)	28 (36%)	49 (28%)	62 (37%)
Rich	101 (41%)	31 (40%)	82 (47%)	66 (40%)

*(missing 41 (17%)) ** (missing 20 (11%))

The rich to poor ratio has increased for hospitalization in the recent surveys from 1:0.09 to 1:1.7. The increase has been more evident when the services were accessed from private sector (1:0.4 to 1:1.6).

Catastrophic expenditure

The catastrophic expenditure was evident when the services were accessed for hospitalization and this was more-so for services in private sector. The expenditure in private sector increased from 27% in 71st round to 34% in 75th round surveys. Overall, the proportion of catastrophic expenditure increased by 2% in the recent survey. The poor income groups faced more catastrophic expenditure in the recent survey, when the services were accessed both in public as well as private sector. However, the expenditure was double when the services were accessed from private sector [Table 4].

Discussion

The findings from this study highlight two main points (i) the median OOP expenditure due to any Oral disease was significantly higher in private sector compared to public sector and, (ii) the catastrophic expenditure was highest for poor income households for accessing services in private sector. This is first ever study that has utilised nationally representative data for understanding catastrophic expenditure. The recent analysis by Bernabé *et al.*^[10] showed 6.8% of OOP for Oral disease in India and the probability of catastrophic health expenditure at 19.4%. The expenditure reported are similar to our study findings where the expenditure in 71st round was 20% and 22% in the 75th round surveys.

One needs to understand that Oral healthcare is a specialized service and each individual could receive care depending upon the

type of service needed. This could range from a simple extraction of tooth or teeth to a complex procedure of dental implants which is dependent on whether the care is accessed at public or private sector. The availability of services in public sector could be a challenge. Study from public sector in Jodhpur, Rajasthan, shows that among 251 clients visited for day-care services 39% had restorations, 22% had extraction and 12% had cleaning of teeth and zero complex restoration procedures.^[11] The results from an assessment of 23 public sector facilities in Mangalore explains the inability to perform complex procedures like tooth corrections, impacted tooth/teeth removal and fabrication of dentures services.^[12] This relates to non-availability of complex procedures will be leading to less OOP in public sector. In our study, poor income group paid US\$ 4 for accessing day-care services in public sector. Medicines account for a large share of the expenditure as reported in this study.

Oral healthcare services operate on fee-for-service in private sector and clients access private sector for the services with an assumption that it provides better quality of service irrespective of their socio-economic status. While they access care the fee-for-service depends upon multiple factors which include: size of clinic, level of education of doctor (graduate or post-graduate), prevailing local market rates, local market competition and quality of services provided.^[13] One also needs to understand that there is no standardised pricing policy and each individual is charged at different prices for the same services differently by providers. It is therefore we see the poor households spending more on accessing Oral healthcare services in private sector. In the private sector Oral healthcare services are provided by primary care doctors where doctors will assess and refer patients to nearest dentist for early diagnosis and treatment. Given this approach, the OOP may be reduced for patients and their households.

Table 2: Comparison of household expenditure for Oral healthcare day-care services in NSS 71st Round (2014-2015) and NSS 75th Round (2017-2018) surveys

Income groups	Overall								
	71 st Round (n=204)		75 th Round (n=155)		71 st Round (n=51)				
	Total expenditure	Medical	Non-medical	Total expenditure	Medical	Non-medical			
Poor	7 (2-9)	5 (2-8)	0 (0-0)	5 (3-17)	5 (1-14)	0 (0-2)	4 (3-11)	4 (2-5)	0 (0-4)
Middle	3 (2-7)	2 (2-5)	0 (0-1)	4 (3-7)	4 (3-5)	0 (0-1)	2 (2-3)	2 (2-3)	1 (0-1)
Rich	10 (5-15)	9 (5-15)	1 (0-2)	11 (5-15)	10 (5-14)	1 (0-2)	34 (2-39)	22 (0-23)	12 (0-16)
Overall	7 (3-12)	6 (2-11)	0 (0-1)	5 (4-14)	5 (2-12)	0 (0-2)	4 (2-17)	3 (2-17)	1 (0-4)
Equity ratio	1:0.6	1:0.5	1:0.4	1:0.6	1:0.5	1:0.4	1:0.17	1:0.12	1:0.4
Income groups	Private								
	75 th Round (n=44)		71 st Round (n=153)		75 th Round (n=11)				
	Total expenditure	Medical	Non-medical	Total expenditure	Medical	Non-medical			
Poor	4 (4-12)	4 (1-7)	3 (0-3)	7 (2-8)	7 (2-8)	0 (0-0)	9 (1-46)	9 (1-45)	0 (0-1)
Middle	0 (0-2)	0 (0-2)	0 (0-0)	5 (5-11)	5 (4-9)	0 (0-2)	7 (4-9)	5 (4-7)	1 (0-1)
Rich	75 (2-75)	48 (2-48)	4 (1-26)	10 (5-12)	9 (5-11)	0 (0-1)	11 (5-14)	10 (5-13)	1 (0-2)
Overall	4 (1-6)	1 (1-5)	0 (0-3)	8 (5-12)	7 (4-10)	0 (0-1)	7 (4-15)	5 (4-13)	1 (0-1)
Equity ratio	1:0.05	1:0.08	1:0.6	1:0.6	1:0.7	1:0.9	1:0.8	1:0.9	1:0.9

Note: The annual average of USD exchange rate for the survey periods is 65 to INR

Table 3: Comparison of household expenditure for Oral healthcare hospitalization services in NSS 71st Round (2014-2015) and NSS 75th Round (2017-2018) surveys

Income groups	Overall								
	71 st Round (n=78)		75 th Round (n=167)		71 st Round (n=27)				
	Total expenditure	Medical	Non-medical	Total expenditure	Medical	Non-medical			
Poor	21 (21-75)	20 (20-61)	2 (2-6)	154 (79-363)	108 (19-338)	18 (7-46)	21 (21-21)	20 (20-20)	2 (2-2)
Middle	120 (58-306)	111 (53-306)	5 (5-55)	95 (38-240)	77 (31-231)	15 (9-38)	20 (11-20)	16 (9-16)	3 (3-3)
Rich	220 (55-334)	194 (43-318)	16 (8-26)	131 (45-485)	113 (38-462)	14 (8-23)	35 (35-35)	0 (0-25)	35 (11-35)
Overall	58 (21-263)	53 (20-208)	5 (2-18)	125 (45-363)	108 (34-331)	15 (8-33)	21 (21-21)	20 (20-20)	2 (2-2)
Equity ratio	1:0.09	1:0.1	1:1.7	1:1.7	1:0.9	1:0.6	1:0.6	1:0.6	1:0.6
Income groups	Private								
	75 th Round (n=70)		71 st Round (n=51)		75 th Round (n=97)				
	Total expenditure	Medical	Non-medical	Total expenditure	Medical	Non-medical			
Poor	42 (20-154)	19 (13-108)	15 (8-23)	110 (18-158)	94 (12-154)	6 (6-15)	218 (91-603)	202 (85-538)	25 (6-65)
Middle	33 (16-112)	22 (6-108)	11 (11-34)	263 (58-360)	208 (53-308)	9 (5-55)	154 (74-315)	154 (69-289)	15 (5-39)
Rich	23 (22-62)	14 (14-51)	8 (8-15)	243 (102-335)	238 (94-322)	16 (8-26)	188 (69-558)	177 (55-554)	14 (6-28)
Overall	34 (21-112)	15 (12-108)	11 (8-23)	158 (58-306)	154 (53-306)	9 (5-26)	191 (91-523)	175 (77-462)	15 (6-39)
Equity ratio	1:1.3	1:1.8	1:0.4	1:0.4	1:0.4	1:1.6	1:1.6	1:1.4	1:1.4

Note: The annual average of USD exchange rate for the survey periods is 65 to INR

Table 4: Prevalence of catastrophic expenditure among economic group while availing hospitalization oral healthcare services - NSS 71st Round (2014-2015) and NSS75th Round (2017-2018) surveys

Economic group	71 st Round			75 th Round		
	Overall	Public	Private	Overall	Public	Private
Poor	21%	12%	27%	33%	15%	52%
Middle	28%	0%	47%	17%	3%	28%
Rich	13%	12%	13%	20%	0%	30%
Overall	20%	7%	27%	22%	5%	34%

Oral health is most neglected and the policy and programme designed for better Oral healthcare services have failed to integrate into mainstream healthcare system of India.^[14] The results from this study have shown an increase in OOP expenditure and the catastrophic burden on households. From a recent study it is observed that the cost of Oral healthcare services in private facility is almost 40 times the cost in public facility.^[15] The escalated cost of care has attracted many private insurance institutions to offer financial protection to Oral healthcare services.^[16] The findings call for an urgent need to strengthen insurance mechanism through a formal co-ordination of Indian Dental Associations, Ministry of Health and Family Welfare and Ministry of Finance to avert catastrophic burden on poor households during hospitalization.^[17]

Strengths and limitations

The study analysed secondary data of nationally representative sample which will help in generalizability of findings. The following are few limitations of this study, we have used OOP expenditure as a proportion of annual household consumption expenditure as alternate to understand catastrophic expenditure. Secondly, there was no information on the type of Oral healthcare services provided, severity or any surgical procedure involved. Each of the procedures could have different cost of care and duration of hospitalization involved. Thirdly, indirect costs due to loss of wage were not considered in this study. Fourthly, OOP expenditure for hospitalisation could have recall bias for the expenditure made for a period of up to 365 days.

Conclusion

The study demonstrated significant financial risks associated with Oral disease leading to catastrophic household expenditure, especially among the poor. The OOP expenditure in private sector is increasing highlighting the need for price regulation. There is also need to have insurance mechanism to protect poor households from catastrophic expenditure. In addition, we also advocate for increasing investment in public sector aimed at strengthening Oral healthcare services, accessible and affordable.

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Conflicts of interest

There are no conflicts of interest.

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