

# Health Care Expenditure of Rural Households in Pondicherry, India

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## Abstract

**Background:** Shortcomings in healthcare delivery has led people to spend a substantial proportion of their incomes on medical treatment. World Health Organization (2005) estimates reveal that every year 25 million households are forced into poverty by illness and the struggle to pay for healthcare. Thus we planned to calculate the health care expenditure of rural households and to assess the households incurring catastrophic health expenditure. **Methods:** A cross-sectional study was conducted in the service area of Sri Manakula Vinayagar Medical College and Hospital from May to August 2011. A total of 100 households from the 4 adjoining villages of our Institute were selected for operational and logistic feasibility. The household's capacity to pay, out of pocket expenditure and catastrophic health expenditure were calculated. Data collection was done using a pretested questionnaire by the principal investigator and the analysis was done using SPSS (version 16). **Results:** The average income in the highest income quintile was Rs 51,885 but the quintile ratio was 14.98. The median subsistence expenditure was Rs 4,520. About 18% of households got impoverished paying for health care. About 81% of households were incurring out of pocket expenditure and 66% were facing catastrophic health expenses of 40%. **Conclusion:** There was very high out of pocket spending and a high prevalence of catastrophic expenditure noted. Providing quality care at affordable cost and appropriate risk pooling mechanism are warranted to protect households from such economic threats.

**Key Words:** Health expenditures, health services needs and demand, India (Source: MeSH-NLM).

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## Introduction

The promotion of health is of fundamental value in itself. It is a vital public good and a basic human right. In this regard, delivery of healthcare is very important for providing preventive, promotive and curative services to the community.<sup>1</sup>

There have been substantial achievements in healthcare in past few decades. However, technological innovation in the health sector has improved the quality of life but has also increased costs especially in middle and low income countries. Shortcomings in healthcare delivery have been largely designated as fragmented care, misdirected care and impoverishing care.<sup>2</sup> In countries that have no social insurance and where the role of the state is limited, people spend a substantial proportion of their incomes on seeking medical treatment, and in the process get impoverished, thus widening disparities in the health status.<sup>3</sup> The unpredictability of illness, the lumpiness of health consumption, and the irregular and seasonal nature of incomes make it virtually impossible for the poor to finance their health needs, resulting in a denial of care and poverty.<sup>1</sup>

According to the World Health Organization (2005) estimates, every year 25 million households (more than 100 million people) are forced into poverty by illness and struggle to pay for healthcare.<sup>4</sup> The decline in public investment in health and the absence of any form of social insurance have heightened insecurities. Considering the Indian scenario, a report by the National Health Accounts reveals that 71% of the health budget is contributed by the private sector; of which households alone spend about 69%.<sup>1</sup> It is well known that health expenditure in India is dominated by private spending and this is a reflection of inadequate public spending. The relationship between poverty and ill-health is indisputable. Even relatively small expenditure on health can be financially disastrous for poor households. High out of pocket payment, an absence of risk pooling mechanism in health financing systems, and high level of poverty can result in catastrophic health expenditure.<sup>5</sup> Thus, the present study was conducted to quantify the health care expenditure of households in rural Pondicherry with these objectives; i) to note the health care expenditure of rural households and ii) to assess if any family is undergoing catastrophic health expenditure.

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## Materials and Methods

### Study Setting

Pondicherry (Puducherry), district of India has a total population of 946,600 (census 2011) of which the rural population is about 292,208 (30.87%). Per-capita income of Pondicherry at 2009-10 current prices is in Indian rupee (Rs) 72,917 (draft annual plan 2011-12, Pondicherry) and about 22% are below poverty line (2004-05 Pondicherry estimate).<sup>6</sup> Pondicherry ranks quite high compared to India in terms of fulfillment of several health infrastructure indicators. The total health care expenditure is Rs 80 but the per-capita expenditure is Rs 783 (budget estimate, 2003-04).<sup>7</sup>

### Study Design and Sampling

We planned to study the total health spending so that the burden on households can be commented on. Moreover, to get a better picture of rural areas we studied the rural households. A cross-sectional study was designed and conducted from May to August 2011. We covered four villages, situated within 2-4 kilometers of our Institute (Sri Manakula Vinayagar Medical College and Hospital), for operational and logistic feasibility. The villages were Madagadipet (1174), Kalitheerthalkuppam (1120), Kuchipalayam (158) and PS palayam (441) which constituted our sampling frame and the list of houses of the respective villages were collected from the PHC registers (2011). We planned to survey a total of one hundred households. From the total number of households of the four villages (2893), all sampled households were included in the study. A proportionate sampling method was adopted to draw the sample from the household numbers of each village. The streets in each village were selected by simple random technique. Systematic random sampling method was adopted to select every third household in each street. Initially, a pilot study was conducted to assess and modify the logistic problems expected during the main study.

### Parameters

The total household income and expenses were calculated. For expenditure on health, both direct and indirect expenses were assessed. Direct expenses were costs incurred for the defined medical problem (consultations, investigations, medicines etc.) and the indirect cost included collateral expenses due to the illness (travel, food, loss of wages etc.). We considered the expenses incurred by the households both for their outpatient and inpatient consultations. To avoid recall bias in expenditure, a one month recall period for any OPD consultations and 3 months for any in-patient admissions was considered. For our calculations, we used equivalent household size (household size  $0.56$ )<sup>8</sup> instead of average household size. The various heads of expenses of the households were determined and for accuracy of food expenditure, equivalized food expenditure was calculated. The subsistence expenditure per (equivalent) capita or the poverty line was determined and the subsistence

expenditure (poverty line  $\times$  equivalent household size) was calculated. The household's capacity to pay (non subsistence effective income of households), out of pocket expenditure (OOP), burden of health payment and catastrophic health expenditure (CHE) was calculated adopting the methodology described by Xu K et al.<sup>8</sup> OOP expenditure is defined as the payment made by families for health care and include out of pocket spending on deductibles and other forms of cost sharing such as co-payments and co-insurance and direct expenditure of health care services equipments and supplies not covered by insurance. OOP in our study was the net of insurance reimbursements and did not include indirect expenses (health-related travel and food). CHE is defined as the level of OOP expenditure that exceeds some fixed proportion of household income or household capacity to pay.<sup>9,10</sup> For the purpose of our study, if a household's total OOP equaled or exceeded 40% of the household's capacity to pay (non subsistence effective income of the household or income available after basic needs have been met), it was considered to be facing CHE. We also calculated the households that are poor (total household expenditure less than its subsistence spending) and the non-poor households that were impoverished by health payments.

## Results

The socio-demographic profile of the total households surveyed is described in Table 1. We noted that the majority belonged to the Hindu religion (94%). The various castes were OBC (50%), MBC (44%) and the forward castes (6%). About 81% houses were pucca houses and the majority (93%) were nuclear families. The median 'total' and 'per-capita' income of the households were Rs 10,000 and Rs 2,333 respectively. The average income in the highest (5th) quintile was Rs 51,885 but the "quintile ratio" (richest to poorest) was 14.98. A majority (72%) possessed pink ration cards and 8% did not have any ration card. However, those who participated in different income-generating activities and in self-help groups were 7% and 2% respectively. None of the households had health insurance. The "equivalent household size" was 2.26 and the median 'equivalized per capita household expenditure' was Rs 2323 where as the median "equivalized food expenditure" was Rs 1379. From the food expenditure, the subsistence expenditure per (equivalent) capita or the poverty line was calculated as Rs 2,080 and thus the median "subsistence expenditure" was calculated to be Rs 4,520.

The health facilities preferred by the majority of the households were governmental (24%) and private (74%). About 1% preferred both private and governmental facilities and the remaining 1% preferred chemist shops. About 69% had reported outpatient illnesses and 35% had inpatient illnesses within our specified period of recall. The common outpatient illnesses were fever, cough and cold, diarrhea, body and joint pains, gastritis, poor vision, pregnancy, allergy, TB,

**Table 1.** Socio-demographic characteristics of the study participants

Characteristic	% n = 100
<b>Religion</b>	
Hindu	94
Muslim	5
Christian	1
<b>Housing type</b>	
Pucca	81
Kutchha	8
Semipucca	11
<b>Family type</b>	
Nuclear	93
Joint	7
<b>Possession of ration cards</b>	
Pink	72
Yellow	20
No card	8
<b>Income generating activities</b>	
No	93
Yes	7
<b>Participation in SHG</b>	
No	98
Yes	2
<b>Health Insurance</b>	
No	100
Yes	0
<b>Income Quintile</b>	
1 <sup>st</sup> Quintile (Rs 3462)*	26
2 <sup>nd</sup> Quintile (Rs 6875)*	18
3 <sup>rd</sup> Quintile (Rs 10,188)*	16
4 <sup>th</sup> Quintile (Rs 16,781)*	20
5 <sup>th</sup> Quintile (Rs 51,885)*	20
Quintile Ratio (Richest to poorest)	14.98
Total income (Median)	10,000
Per capita monthly income (Rs, median)	2333
Equivalent household size <sup>†</sup> (Mean ± SD)	2.26 ± 0.4
Equalized household expenditure (Rs per capita, median)	2323
Equalized food expenditure <sup>‡</sup> (Rs, median)	1379
Subsistence expenditure (Rs, median)	4520

\* Figures in parentheses are average Income in the corresponding income quintile.

† Equivalent household size <sup>56</sup> (Adopted from Xu K et al.).

‡ Equalized food exp = Food expenditure / equivalent household size.

Abbreviations: OOP: Out of Pocket expenditure, Rs: Indian rupee, SHG: Self-help group, SD: Standard deviation.

**Table 2.** Reported illness, capacity to pay and consequence of health expenses incurred per households.

Characteristic	% n = 100
<b>Health facility preferred</b>	
Private	74
Governmental	24
Both	1
Chemist shop	1
Outpatient illness (Reported within 2 months)	69
Inpatient illness (Reported within 3 months)	35
<b>Household spending on health (n=84, who reported any illness, as % of their total Income)</b>	
<20%	35
20-50%	14
> 50%	35
<b>Household's capacity to pay</b>	
Rs 10,000	71
Rs 10,000-30,000	18
Rs >30,000	11
OOP incurred	81
<b>OOP share of total income</b>	
≤50%	48
>50%	33
<b>OOP share of total expenses</b>	
≤50%	33
>50%	48
<b>OOP share of capacity to pay</b>	
<20%	6
20-40%	15
>40%	60
Poor (Below poverty line)	29
Impoverishment (Due to health expenses)	18

\* Note: Median OOP spending per household was Rs 3000. Median subsistence spending (expenditure) of the households was Rs. 4520. The households' capacity to pay is calculated as the non-subsistence effective Income of households. CHE is calculated as OOPCTP ≥40%. About 18% are impoverished paying for their healthcare expenses. Abbreviations: OOP: Out of Pocket expenditure, Rs: Indian rupee.

**Table 3.** Prevalence of Catastrophic Expenditure by Cut off Levels (of OOPCTP)

Catastrophic Threshold (OOPCTP)	No of Households with illness (n = 81)	% of Households with illness <sup>†</sup>	Household Expenditure/m (Median)
< 20%	6	7	520
20-40%	15	19	600
>40%	60	74	8025

\* CHE, i.e. OOPCTP ≥ 40% was incurred by 66%.

† Illnesses include both outpatient and inpatient categories.

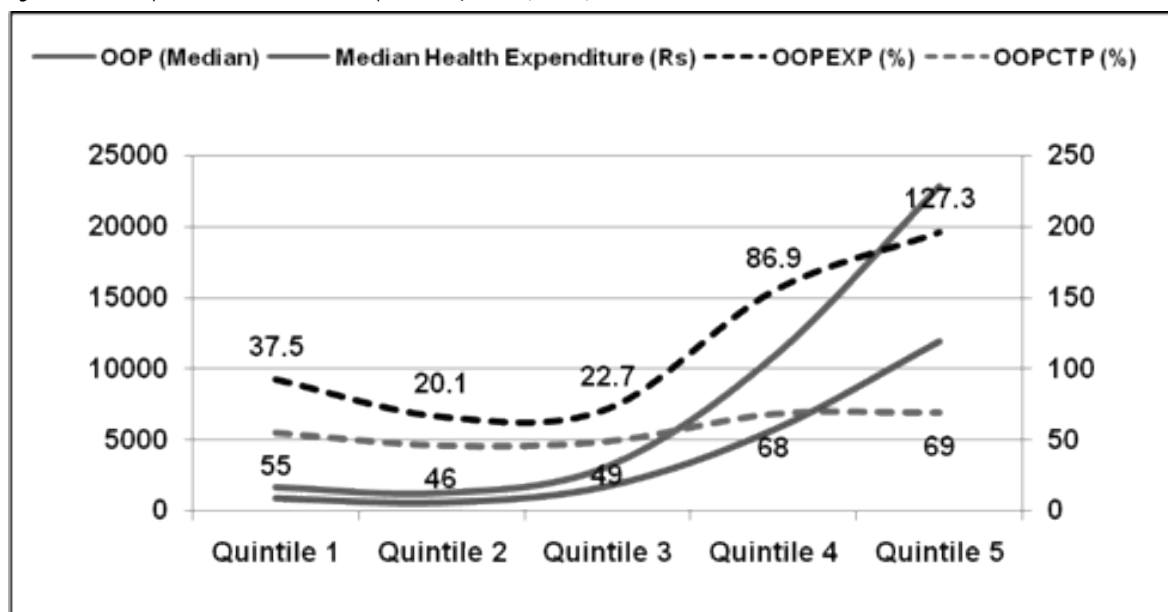
Abbreviations: OOP: Out of Pocket expenditure, OOPCTP: OOP share of capacity to pay.

**Table 4.** Health Expenses Incurred across the Expenditure Quintile (n = 100)

Expenditure Quintiles	Median Health Expenditure (Rs)	OOP in Rs (Median)	OOPCTP (%)	OOPEXP (%)	Impoverished (%)
1 <sup>st</sup>	926	725	55	37.5	Nil
2 <sup>nd</sup>	625	610	46	20.1	Nil
3 <sup>rd</sup>	1775	1330	49	22.7	55
4 <sup>th</sup>	5710	5110	68	86.9	35
5 <sup>th</sup>	11900	10900	69	127.3	Nil

Note: Health Expenditure included both direct and indirect expenses but the OOP takes only direct expenses into consideration

**Figure 1.** Health Expenses Incurred across the Expenditure Quintiles (n = 100)



diabetes and hypertension. The common inpatient illnesses were accidents, abdominal pathologies and major abdominal surgeries, obstetric and gynecological complaints, hernias, fractures, tumors and non healing ulcers. Out of the households who reported some illness (84%), about 49% were spending about 50% of their total income and 35% were spending even >50% of their incomes (direct and indirect expenses) on health (Table 2).

Analysis of the households' capacity to pay showed that the majority had the capacity to pay up to Rs 10,000 (71%) while the remaining had the capacity to pay more. About 81% of the households were incurring OOP expenses (only direct health expenses were considered) and the median OOP spending per household was Rs 3,000 (Table 2). For 33% of households, the OOP incurred was 50% of their total expenses but for 48% of households, OOP incurred was even >50% of their total expenses. About 29% of the households whose total household expenditure was less than their subsistence spending were already poor, but about 18% were impoverished by paying for health expenses (Table 2).

The OOPCTP of  $\geq 40\%$ , i.e., CHE was incurred by 66% of households (Table 2). The percentage of households at catastrophic threshold of <20%, 20-40% and >40% cut off levels were 6%, 15% and 60% respectively (Table 3). We noted that households with higher proportion of reported illnesses and those belonging to higher median household expenditure categories were incurring high CHE. Across the different expenditure quintiles (Table 4, Figure 1), the median health expenditures and median OOP were noted to increase gradually. The OOPCTP and the OOPEXP were highest in the higher expenditure quintiles (4th and 5th quintiles). The OOPEXP was even more than 100% in the highest (5th) expenditure quintiles. We also noted that there was impoverishment in the middle expenditure quintiles (3rd and 4th); whereas lowest and highest ones did not show impoverishment. Table 5 represents a picture of the households under poverty and those who got impoverished by paying for health care expenses across income quartiles. We noted that the highest number of poor households (65%) were in the first quartile and the tendency gradually decreased towards the highest quartile. On the contrary, households that faced impoverishment (paying for health care expenses) were 27%, 21% and 24% in the 2nd, 3rd and 4th quartile respectively. There was no impoverishment noted in the first quartile.

**Table 5.** Poverty and Impoverishment across Income Quartiles (n = 100)

Income Quartiles	Households (No)	Poverty, n (%)	Impoverishment, n (%)
1 <sup>st</sup>	26	17 (65)	0 (0)
2 <sup>nd</sup>	30	7 (23)	8 (27)
3 <sup>rd</sup>	19	4 (21)	4 (21)
4 <sup>th</sup>	25	1(4)	6 (24)

## Discussion

We present the burden of health payments suffered by the rural households of Pondicherry, India. Information of household expenditure was gathered, particularly on healthcare expenses with respect to their total incomes and expenditures. Even though, most of the households belonged to Prasad's class I (48%) of socio economic status, the high quintile ratio (14.98) indicates a gross inequality among the richest and poorest quintiles. About a third of households had a greater subsistence spending than the total expenditure (29%, poor), which unfortunately was also accompanied by scarce participation in income-generating activities and no health insurance benefits.

It was observed that within the specified recall period of our study, households that reported some illness were spending a major portion of their income on health. Considering the unpredictability and increased frequency of illnesses, health expenditure amounts to a major burden on the households. However, due to the cross-sectional nature of the study we could not determine the frequency of illness. Additionally, preference for private health care facility was supposed to pose a great burden on the households because it usually incurred higher healthcare costs. According to the emerging market report in India from 2007, the private sector accounts for more than 80% of total healthcare spending.<sup>11</sup> Unless there is a decline in the combined federal and state government deficit, the opportunity for significantly higher public health spending would be limited. The majority of households in our study had low capacity to pay (71%) and most preferred a private health care facility (74%). On the other hand, households were spending even more than half of their total expenses on healthcare from out of pocket and the burden of payment faced was high. We also noted that most households in the first income quartile were already poor (65%) whereas those that got impoverished were more likely to be in the higher income quartiles. It could be due to the fact that higher income groups spent more for their healthcare because of higher affordability. This was further evidenced as shown in Table 4 and Figure 1; median health expenditure increased across the expenditure quintiles and OOP and OOPCTP also increased. The high burden of OOP was remarkable in our study; even well above households' total expenses in the highest expenditure quintile (127%).

According to a report of the National Commission on Macroeconomics and Health 2005, households undertook 75% of all health spending in the country.<sup>1,12</sup> Analysis of health care spending in union territories of India in 2004-05 revealed the per-capita health expenditure to be Rs 598 with households spending about 85% and the government spending at just 9%.<sup>13</sup> A study of catastrophic household expenditure on childhood illness in an urban slum of Karnataka, India, showed that all households were undergoing catastrophic expenses at a 5-20% threshold.<sup>14</sup>

## Conclusion

There was very high OOP spending and high prevalence of catastrophic expenditure noted in our study. Irrespective of the income and expenditure categories, households were incurring CHE and there was substantial amount of income spent on healthcare. We recommend improving the quality of primary care services to make it more accountable to community necessities which would minimize private healthcare expenses. Increased community awareness to participate in income-generating activities to strengthen their household economy is needed. There should be appropriate risk pooling mechanisms to protect households from incurring catastrophic expenses.

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