

Research Article

Out-of-pocket Expenditure on Vaccination against Communicable Diseases of Under-five Children in Chengalpattu, Tamil Nadu

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A B S T R A C T

Background: Out-of-pocket expenditure is an important determinant for complete vaccination status against communicable diseases in India. This study examines the expenditure incurred during the immunisation process as well as the pattern of differences in expenditure between private and public healthcare systems.

Materials & Methods: A cross-sectional study was carried out among the mothers of under-five children residing in the Rural Health Training Centre's field practising area of a tertiary care hospital in Chengalpattu. Three hundred and seventy-six mothers were selected using cluster sampling. Probabilities proportional to size clusters were chosen. Mothers were selected randomly and interviewed using a pre-validated semi-structured questionnaire. The obtained data were analysed using the SPSS software version 21.0.

Results: Parents who decide to have their child vaccinated in a public health facility are expected to disburse anything from INR 0 to INR 8062.60, or roughly 0.7% to 4.7% of the family's overall revenue. The main causes of expenditure were transportation to hospitals and wage losses. Parents may spend between INR 2743.40 and INR 44,742.20, or 4.90% and 11.4% of the overall family income on immunisations for their kids in private hospitals. The cost of the vaccine appeared as the greatest expense in private health facilities.

Conclusion: In the form of transport and loss of wages, parents indirectly pay for vaccination. The workforce will save their pockets if a child can be vaccinated in hours beyond the working hours of the parents. Raising public awareness of the provision of vaccines in neighbouring government health centres is a way to reduce transport costs.

Keywords: Vaccination, Out-of-pocket Expenditure, Under-five Children

Introduction

Children are the foundation of the family as well as the nation. It is estimated that globally there are around 680 million under-five children, and India has around 118 million of them.¹ In public health, prevention is a key objective. This key objective could be achieved in children with the help of a vaccine. Vaccines protect against serious, often deadly diseases, by preparing your body to fight the disease by enhancing the inbuilt defence mechanism.² The Government of India is striving to achieve full immunisation status. Every year budgets are laid for immunisation programmes, and year after year, the amount spent for it is also increased to achieve 100% immunisation status. In 2013, INR 4,570 crores were spent on immunisation, and by the year 2017, INR 9,451 crores were spent on vaccination of children.³ It is estimated that about 1.73 billion dollars would be required for each district of India to achieve 90% vaccination status, according to the universal immunisation programme (2018–2022).⁴ It is estimated that 34.4% of the fund is spent on routine recurrent costs, 38.4% is spent on capital costs, and 25.4% of it is spent on supplemental immunisation activities. Vaccines account for 8.3% of the national budget for routine recurring costs. In addition to these, transporting vaccines, maintenance, and cold chain equipment, account for 3.8%, 2.0%, and 1.3% of total expenses, respectively.³ Despite the efforts by the government, 100% immunisation status has not been achieved. The determinants of detriments to full immunisation status are being studied invariably by many researchers, in which out-of-pocket expenditure has been found to be the most common determinant.^{5–7} Out-of-pocket expenses can be incurred during any process of immunisation and can act as a major barrier to vaccination coverage. In the present study, various ways by which expenses are incurred during the process of immunisation and how they differ in the private and government health facilities are studied which helps in determining the ways of handling it.

Materials and Methods

The research team conducted this community-based cross-sectional study over a period of two years, from January 2021 to October 2022 in the field of practice of the Rural Health Training Centre of a teaching hospital in Chengalpattu district of Tamil Nadu on parents of under-five children residing in this area.

Inclusion Criteria

- Parents with children between 0 and 5 years of age, who were willing to be a part of the study
- Permanent residents of the study setting

Exclusion Criteria

- Residents who were unable to converse in Tamil or English

- Residents who were diagnosed or treated for any psychiatric illness including postnatal depression

Sample Size

The sample size for the present study was estimated with the prevalence of unimmunised children as 20% as obtained from a previous study by Pattnaik S et al.⁸ with a confidence interval of 95%, allowable error of 6%, non-response rate of 10%, and design effect of 2. A total of 376 mothers were intended to be approached for participation in the study. Cluster sampling was used to select the mothers for participating in the study.

There were 12 villages under the RHTC's field practising area of a tertiary care teaching hospital, and each village was considered a cluster. Using probability proportional to size, 8 clusters were selected from 12 clusters. 31 mothers were selected randomly from each cluster and interviewed for the study. As the last cluster had more population, 159 mothers were interviewed from that cluster.

Study Tool

After obtaining approval from the Institutional Ethics Committee, participants' responses were gathered using a pre-validated, semi-structured questionnaire. The questionnaire had two sections. The first part of the questionnaire collected sociodemographic details of the child. The second part of the questionnaire was about the out-of-pocket expenses incurred by the family during the process of getting their child immunised. A pilot study (N = 94) was undertaken, and the questionnaire was then revised.

Data Entry and Statistical Analysis

The collected data were entered in Microsoft Excel and analysed with the help of the SPSS software version 21.0. Proportions were employed in order to express qualitative factors. Quantitative variables were expressed in terms of mean, standard deviation, median, and interquartile range.

Results

Among the mothers in the villages of the field practice regions of a tertiary care hospital's RHTC, 376 were interviewed for this community-based cross-sectional study.

Table 1. Sociodemographic Profile of the Under-five Children in the Study

(N = 376)

Variable	n (%)
Age (year)	
< 1	73 (19.4)
1–3	111 (29.5)
3–5	192 (51.1)
Gender	
Male	186 (49.5)
Female	190 (50.5)

Religion	
Hindu	301 (80.1)
Christian	54 (14.4)
Muslim	21 (5.6)
Socio-economic status (according to modified BG Prasad classification)	
Class I	56 (14.9)
Class II	150 (39.9)
Class III	112 (29.8)
Class IV	39 (10.4)
Class V	19 (5.1)

Table 1 contains information about the sociodemographic characteristics of children under the age of five years. The ages of the children who participated in the study ranged between 1 month and 60 months. Children between the age group of 3–5 years comprised about 50% of the study population making the majority. Only 73 (19.4%) children were under the age of one year. The mean age of the children was 33.9 ± 19.2 months. With 190 (50.5%) female and 186 (49.5%) male children, the gender distribution of the under-five children in the study was almost equal. Hindus made up 80% of the study’s participants, while Muslims made up only 5.6% of the total.

Mothers were questioned about the place where they got their children vaccinated and their answers were categorised as shown in Table 2. Only 32 (8.5%) children were vaccinated in private health facilities. Among all the participants, 7 (1.9%) children got vaccinated in both private and government health facilities. The rest of the mothers (89.6%) got their children vaccinated in government health facilities. Of those, most of them, 47.3% got vaccinated in either Community Health Centre/ District Hospital/ Primary Health Centre/ Sub-centre.

Out-of-pocket expenditures incurred by the parents in getting their children vaccinated in government health facilities are listed in Table 3. Children can get vaccinated from government health facilities free of cost. The maximum amount spent by a parent to get their child vaccinated in government health facilities was INR 8,062.57. The total mean amount spent on vaccination by parents in government hospitals was INR 1,180.93 ± 6,881.64. This accounted for 0.7% to 4.7% of the mean family income earned by the family in a year. The minimum amount spent on transportation, loss of wages, treatment of side effects due to vaccination, and consultation was zero in government hospitals. The maximum amount was lost due to loss of wages, which was about INR 5,000.

Table 2. Distribution of the Under-five Children according to the Place of Vaccination

(N = 376)

Centre Where the Child got Vaccinated	n (%)
Community Health Centre/ District Hospital/ Primary Health Centre/ Sub-centre	178 (47.3)
Anganwadi centre	84 (22.4)
Government medical college/ hospital	65 (17.3)
Private clinics/ hospital	32 (8.5)
Others (mixed centres)	17 (4.5)

Table 3. Out-of-pocket Expenditure Incurred by the Parents in Getting Their Children Vaccinated in Government Health Facilities

(N = 337)

Areas of Expenditure	Average Maximum (in INR)	Mean Amount Spent (in INR)	Mean Range of Amount Spent (in INR)	Mean Family Income Spent per Year (%)
Trans- portation charges	2,000.00	138.87	0 to 712.87	0.6–0.9
Loss of Pay	5,000.00	169.63	0 to 862.72	0.1–0.7
Treatment cost	1,000.00	88.87	0 to 522.17	0.1–0.5
Consultation charges	2,800.00	54.75	0 to 334.80	0.0–0.9
Total cost	14,500.00	1,180.93	0 to 8,062.57	0.7–4.7

Table 4. Out-of-pocket Expenditures Incurred by the Parents in Getting Their Children Vaccinated in Private Health Facilities

(N = 39)

	Minimum Amount Spent (in INR)	Maximum Amount Spent (in INR)	Mean Amount Spent (in INR)	Mean Range of Amount (in INR)	Mean Family Income Spent per Year (%)
Transportation charges	100	10,000.00	3,049.74	0 to 6,121.89	0.8–9.7
Loss of pay	0	5,000.00	1,120.51	0 to 2,623.35	0.2–0.6
Vaccination cost	0	45,000.00	17,487.18	0 to 35,272.26	3.4–5.4
Treatment cost	100	5,000.00	726.92	0 to 220.98	0.2–0.8
Consultation charges	5	8,000.00	1,369.23	0 to 3,777.62	0.3–0.9
Total cost	100	61,000.00	23,722.82	2,703.41 to 44,742.00	4.9–11.4

Out-of-pocket expenditures incurred by the parents in getting their children vaccinated in private health facilities are listed in Table 4. The average amount that was spent for vaccination by the parents in private health facilities ranged between INR 2,703.41 and INR 44,742.00. It accounted for 4.9% to 11.4% of the mean family income earned by the family in a year. The maximum amount was spent on getting the vaccines, which cost up to INR 35,272.26 for a parent.

Discussion

The use of healthcare services is significantly influenced by out-of-pocket expenditures. This also has an influence on children's routine immunisation. In the present study, it was estimated that a mean expense of INR 1,180.93 was incurred by the family if they got their children vaccinated in a government health facility. This accounted for 0.7% to 4.7% of the mean family income per year. If they got their children vaccinated in a private healthcare facility, the mean expense that could be incurred was INR 23,722.82. This accounted for 4.9% to 11.4% of the mean family income per year. Srivastava et al.⁹ studied the individual expenditure for immunisation at the regional level in the year 2017. They reported that the mean expenditure for immunisation could vary from one region to another. The average cost of immunisation services in government health facilities in east Indian states like Orissa and Nagaland, north Indian states like Jammu & Kashmir, and south Indian states like Telangana can be higher than INR 50. In places like Delhi, Rajasthan, and Chhattisgarh, it may cost as low as INR 10. In contrast, private healthcare facilities may charge more. In Delhi and West Bengal, it might reach as much as INR 4,274. In Tamil Nadu, the mean expenditure for immunisation in a government facility is estimated to be INR 22 and an expense of INR 2,026 can be incurred if vaccinated

in private hospitals/ clinics. This change in expense can be due to the addition of new vaccines and inflation.

Among the determinants of out-of-pocket expenditure, loss of wages cost INR 169.63, and transportation charges cost INR 138.87 for the parents who got their children vaccinated in government sectors whereas, INR 1120.51 was lost due to absence from work, INR 3049.74 was spent on transportation, and INR 17487.18 was spent on the cost of vaccine by the parents who got their children vaccinated in private sectors. The cost of the vaccine was the major factor influencing out-of-pocket expenditure in private hospitals/ clinics and it did not affect government healthcare facilities as the vaccines are available free of cost. When assessing out-of-pocket expenses and their determinants for regular immunisation procedures in primary healthcare facilities in Rajasthan, Mathur et al.¹⁰ found that an individual spent, on average, INR 54.02 ± 70 for immunisation. The cost of lost wages was INR 42.34 ± 48 whereas, the cost of immunisation was INR 11.70 ± 14. The variance in the expense may be the consequence of the difference in wages, cost of living and changes in vaccination due to endemic diseases.

Conclusion

The government of India, in order to attain 100% vaccination status among children, have introduced lots of services including the availability of vaccines free of cost in all centres, outreach by Auxiliary Nurse Midwife, etc. Despite the fact that vaccinations are provided without charge at government health institutions, parents still have to pay out of pocket due to transportation costs and wage losses. The working population can better balance their personal and professional lives by receiving vaccinations for their

children even in the evening. Reduced transportation costs can be achieved by raising public awareness of the neighbouring government healthcare centre's provision of vaccines and by maintaining a standard of care and service across all government healthcare institutes. Coordination between the public and private health systems will lower the out-of-pocket expenses for private health services and increase vaccine coverage.

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