



ASSESSMENT OF OUT OF POCKET EXPENDITURE FOR TREATMENT OF MALARIA IN SURAT CITY

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ABSTRACT

Introduction: The major burden of vector-borne disease in India comes from malaria; according to the Directorate of the National Vector Borne Disease Control Programme (NVBDCP), about 95% of the population in the country resides in malaria-endemic areas. Due to such burden of disease, infected individuals have reduced or lost their capacity to work. In India, health services are funded largely through out-of-pocket expenditure. We carried out this study to collect data on the cost of an illness episode of malaria in Surat city.

Methodology: It is a cross sectional study carried out in Surat city. Pre tested questionnaire was used for interview. Total 118 patients were interviewed after taking informed consent.

Result: For single episode of malaria the mean OOP expenditure was ₹1803 among patients treated at govt. set up while it was ₹ 6768. Indirect cost was 67.99% and 39.84% of total OOP expenditure in patient treated in govt. set up & private set up respectively.

Conclusion: Even after free services in government set up patient had to spent amount (1/4th treatment cost of private set up) beyond their expectation.

Key words: Out of pocket expenditure, malaria, Surat city.

INTRODUCTION

Malaria is a major public health problem across the globe though it is both a preventable and treatable disease¹. As per the WHO estimates 207 million cases of malaria occurred globally in 2012 (uncertain range 135-287 million) and 6,27,000 deaths (uncertain range 4,73,000- 7,89,000); about 80 per cent of these cases were found in African countries and 13 per cent in South East Asia Region (SEAR) countries¹. India contributes to 61 per cent of malaria cases and 41 per cent of malaria deaths in SEAR countries².

According to the NVBDCP, of the reported 1.06 million cases in 2012, 50.01% are due to *P. falciparum* in India³. The major burden of vector-borne disease in India comes from malaria; according to the Directorate of the National Vector Borne Dis-

ease Control Programme (NVBDCP), about 95% of the population in the country resides in malaria-endemic areas³. It is possible that the actual numbers of malaria cases are higher because large number of infected individuals might be seeking treatment from private health providers, who do not report to NVBDCP⁴. Due to such burden of disease, infected individuals have reduced or lost their capacity to work. In areas of high prevalence this can have a significant negative impact on labour productivity. Malaria can impose significant burdens on households and on the overall economy.

In India today health services are provided mainly by private providers and funded largely through out-of-pocket spending of care-seekers, when healthcare delivery occurs⁵⁻⁹. The direct medical

expenses incurred by sick individuals and their families in obtaining treatment, often in the context of poor performing healthcare systems which are unable to provide effective coverage with free or subsidized services¹⁰. The indirect out of pocket expenditures imposed on families who have to devote significant time and resources to look after sick family-members or who suffer significant income losses which in turn reduces the ability of the family to perform their work¹⁰. Lost labour time due to illness often means household capacity to earn income is reduced at a time when it needs additional money to pay for treatment¹¹.

Despite the significant burden of vector-borne diseases in India, there is a lack of studies on the economic burden on households and likely OOP expenditure of these illnesses. This -paper is to analyse the direct and indirect OOP expenditures of malaria.

METHODOLOGY

It was a cross sectional study. The data were purposefully collected from selected locations of Surat city. This study was conducted during the period of September 2015 to November 2015. During this period we had taken interview by using the pre tested questionnaire of patients, who were voluntarily agreed to respond us for the interview and were uninsured. Those patients were included in the study who had at least one episode of malaria in last three months. The pretested questionnaire was based on two components of the Out Of Pocket expenditure namely (i) Direct Out Of Pocket expenditures (Direct OOPE) includes consultation charges, medication expenditure, laboratory charges and hospitalization charges¹². And (ii) Indirect Out Of Pocket expenditures (Indirect OOPE) includes loss of wages of ill patients and also of those who were care-givers and transportation charges for seeking the treatment¹². The collected data were entered into MS excel sheet and were statistically analysed by using Epi-info software. There was wide disparity in the data due to presence higher extremities, so we had used median for comparing the variable in two or more sub groups and used non parametric median (Mann Whitney U test) test and independent “t” test to examine significant difference.

RESULT

This study was conducted on 118 patients of malaria who had at least one confirm episode of malaria and uninsured and who respond us.

Table: 1 Comparison of total Direct Out of Pocket expenditure of malaria treatment with other variables

Variables	N	Total Direct out of pocket expenditure Mean (SD)	P value
Age			
<15 years	38	879.5 (910.52)	0.031
>15 years	80	2213.99 (3701)	
Gender			
Male	72	2028.33 (3431)	0.294
Female	46	1402.17 (2632)	
Place of Treatment			
Government	63	581.44 (557.6)	<0.05
Private	55	3161.98 (4181)	
Type of malaria			
P.vivax	77	1336.87 (2073)	0.01
P. falciparum	31	3220.35 (4952)	
Mixed*	10	777 (880.95)	
Hospitalisation			
Yes	73	2422.05 (3805)	0.005
No	45	749.55 (932.89)	

*P.vivax & P. Falciparum both infection

Table: 2 Comparison of total indirect Out of Pocket expenditure of malaria treatment with other variables

Variables	N	Total Indirect out of pocket expenditure Mean (SD)	P value
Age			
<15 years	38	1423.16 (982.01)	0.11
>15 years	80	2147 (2680)	
Gender			
Male	72	2333.89 (2790)	0.012
Female	46	1256.52 (836.61)	
Place of Treatment			
Government	63	1226.67 (707.11)	<0.05
Private	55	2701.09 (3108)	
Type of malaria			
P.vivax	77	1781.82 (2052)	0.213
P. falciparum	31	2475.48 (303)	
Mixed*	10	1190 (710.94)	
Hospitalisation			
Yes	73	2273.29 (2579)	0.03
No	45	1330.89 (1601)	

*P.vivax & P. Falciparum both infection

Table-1 shows that age, type of malaria, place of treatment and hospitalisation was significantly associated (p <0.05) with direct out of pocket expenditure. While gender was not significantly associated (p >0.05) with Direct out of pocket expenditure spent for treatment of malaria. Older age (>15 years) had to spend more money. It was known that the expenditure for treatment of malaria like outdoor patient department and hospitalization was more in private sector than government sector. It was observed that the direct out of pocket expenditure was significantly higher (more than twice) for an episode of P. Falciparum as compared to P. Vivax.

Table: 3 Comparison of total out of pocket expenditure of malaria treatment with other variables

Variables	N	Total out of pocket Expenditure Mean (SD)	P value
Age			
<15 years	38	2804.76 (2026)	0.052
>15 years	80	4741.14 (5908)	
Gender			
Male	72	4898.36 (5951)	0.036
Female	46	2895.43 (2901)	
Place of Treatment			
Government	63	1803.03 (1084)	<0.05
Private	55	6768.75 (6396)	
Type of malaria			
P.vivax	77	3404.56 (3912)	0.004
P. falciparum	31	6582.29 (7197)	
Mixed*	10	1967 (1318)	
Admission in hospital			
Indoor	73	5057.84 (6058)	0.01
Outdoor	45	2592.22 (2102)	

*P. vivax & P. Falciparum both infection

Table-2 shows that gender, place of treatment and hospitalisation were significantly associated ($p < 0.05$) with Indirect out of pocket expenditure spent behind treatment of malaria. Age, type of malaria was not significantly associated ($p > 0.05$)

Table: 4 Comparison of cost of illness (out of pocket expenditure) in Government and private health set up

Out of pocket expenditure of illness (in INR)	Government (N=63) Median (min-max)	Percentage	Private(N=55) Median (min-max)	Percentage
Direct OOP expenditure	460(266-840)	27	1550(560-3670)	31
Indirect OOP expenditure	1250(600-1600)	75.75	1700(400-3200)	34
Total OOP expenditure	1650(1040-2360)	100	5000(2200-8100)	100

OOP=out of pocket

DISCUSSION

In our study, age was significantly associated with direct OOPE but not with indirect OOPE. But on observing the data, the mean expenditure of both direct and indirect OOPE in older age (> 15 year) group was nearly same. So it indicates that this significant association might be by chance.

Indirect OOPE was significantly associated with the gender. The data clearly shows that the expenditure is almost double in male than female as in our country mainly male is only the earning person of the family.

Our study shows that direct OOPE and indirect OOPE was much higher in private health setup which is quite obvious, this means diseases and its overall expenditure behind sick individual leads to more economic catastrophe to the family especially of lower middle class(according to modified Prasad classification).

with Indirect out of pocket expenditure spent behind treatment of malaria. Indirect out of pocket expenditure more than two times higher in private and hospitalisation too. Indirect out of pocket expenditure is almost double in male as compare to female.

Table-3 shows that, gender, types of malaria, place of treatment, hospitalisations were significantly associated ($p < 0.05$) with Total OOP expenditure spent behind treatment of malaria. Moreover it is observed that age was not significantly associated ($p > 0.05$) with total OOP expenditure of malaria. Total OOPE of private sector was too much high. In falciparum malaria this cost causing catastrophic increase. Hospitalisation leads to double the cost of illness.

For single episode of malaria, people were spending 1784.23 INR for treatment of disease and 1912.11 INR for subsidiary cost of illness which was almost same. P value was found to be less than 0.05 for direct and total expenditure that was statistically significant. While P value for indirect expenditure was 0.084 which was not statistically significant and from the table it clearly shows that indirect expenditure was almost same for both government as well as private health set up.

Our study found average expenditure for the treatment of malaria was 1650 INR (18.73 US\$) and 5000 INR (74.94 US\$) in government and private, respectively. For the treatment of Malaria cases, those who are seeking free government treatment also indirectly spent INR 1250 per episode. Though it is less than indirect expenditure by cases availing private medical care, it still contributes around entire one to two months family income of lower socio-economic class.

In study of Obinna Onwujekwe, Nkoli Uguru at al¹³ mean direct OOPE, Indirect OOPE(excluding transportation) was 3.05 US \$ and 9.11 US \$ respectively in outdoor patients of malaria. And mean direct OOPE and indirect OOPE (excluding transportation) was 6.73 US \$ and 12.88 US \$ respectively, in hospitalised patients. In study of Elisa Sicuri, Carol Davy at al¹⁴ mean direct OOPE(including transportation) was 1.81 US\$, 0.62 US\$ in Madang and maprik of Papua New Guinea

(PNG), respectively while mean indirect OOPE 5.73 US \$, 8.58 US \$, in Madang and maprik respectively in outdoor patients. In hospitalised patients malaria mean direct OOPE (including transportation) was 2.98 US\$, 2.85 US\$ in Madang and maprik of Papua New Guinea (PNG), respectively while mean indirect OOPE 15.88 US \$, 9.65 US \$, in Madang and maprik respectively. In our study mean direct OOPE, Indirect OOPE (excluding transportation) was 11.22 \$ and 19.91US \$ respectively in outdoor patients of malaria. And mean direct OOPE, Indirect OOPE (excluding transportation) was 36.24 US \$ and 34.02US \$ respectively in hospitalised patients. This seems to be quite high.

As definition of direct and indirect OOPE is different in both studies we should focus on total expenditure. In study of Obinna Onwujekwe, Nkoli Uguru at al¹³ mean total OOPE was 12.57 US \$ in outdoor patients. And in hospitalised patients it was 23.20 US \$. In study of Elisa Sicuri, Carol Davy at al¹⁴ mean total OOPE was 7.54 US \$, 9.20 US \$ in Madang and Maprik of Papua New Guinea (PNG), respectively in outdoor patients. While in indoor patients mean total OOPE was 25.20 US \$, 14.8 US \$ in Madang and Maprik respectively. While in this study mean total OOPE was 38.88 US \$ in outpatient department and 75.87 US \$ in inpatients department. This might be due to medical cost higher in our country as compare to other country reflects on over all expenditure for malaria.

Studies show that *P. Falciparum* has more chance to develop complication than *p. vivax*¹⁵. So for treatment of *P. Falciparum* it causes more expenditure which includes medication, indoor stay and laboratory investigation, which reflects on direct OOPE.

For single episode of malaria the mean OOP expenditure was ₹1803 among patients treated at govt. set up while it was ₹ 6768. Indirect cost was 67.99% and 39.84% of total OOP expenditure in patient treated in govt. set up & private set up respectively.

CONCLUSION

Though government is providing free of cost treatment for malaria, still lower middle class has to suffer a lot merely not only due to disease but due to hidden indirect subsidiary cost of malaria. Though it is less than indirect expenditure by cases availing private medical care, it still contributes around entire one to two months family income of lower socio-economic class. This concludes that for so called 'free' services in government set up, patients directly or indirectly spent almost 1/4rd amount that spent in private setup. This recom-

mends that we should explore more government facilities for the treatment or encourage people to use the government setup in seeking treatment for it. Government should also focused on reduction of indirect OOP expenditure incurred transportation charges and mainly loss of wages of ill patients and care giver.

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