

Cost of Infection Study Findings: India

Katie Greenland & Wolf-Peter Schmidt, 11th June 2012

Environmental Health Group, Department of Disease Control
London School of Hygiene & Tropical Medicine

BACKGROUND

Cost-of-illness studies inform public policy and disease control priorities and can be conducted from the perspective of society, the health care system, businesses, government or families. There is relatively little evidence on the household cost of illness among resource-poor persons. This study aimed to investigate the household cost of infection that can be prevented by handwashing with soap in India, Indonesia, Brazil, Saudi Arabia and South Africa. This report is restricted to discussion of the data from **India**.

METHODS

The study was conducted in urban areas in India's two largest cities: Mumbai and Delhi. Households were selected using a stratified random sampling plan wherein each city was divided into zones/strata's and a random survey starting point was selected within each zone. Subsequent households in each zone were selected using the "right hand rule", whereby two households were skipped following every contact with an ineligible household and three households were skipped following every successful interview. If a selected household was locked or declined to participate the household immediately adjacent was selected instead.

The questionnaire survey was administered face-to-face in a local language to one married female respondent in each household. Households with no children below twelve years of age were excluded. The questionnaire enquired into whether any family members had experienced diarrhoea, skin infections (rash, blister or prickly heat) or respiratory illness in the last two months. Households with no illness were not questioned further. Respondents were asked detailed questions on the direct (out-of-pocket medical costs, transport and accommodation costs) and indirect costs (lost working days of patient or carer, time lost travelling) of each episode of illness. Additional data on school absenteeism were also collected but are not included in the indirect costs calculations – the meaning of assigning a monetary value to a child not attending school is debatable. The survey included additional questions on the type of illnesses experienced at different times of year (summer, winter, monsoon and back to school) and whether and how the mother believed such illnesses could be prevented. Data collection was conducted by a contracted data collection agency and analysis was carried out by LSHTM using STATA 12.

STUDY POPULATION

A total of 628 households were approached for interview, of which 108 were dropped because they declined to participate in the survey after screening and 372 were deemed ineligible because they had recently participated in a survey, the respondent was single, there were no children aged under 12 in the household or the household had not experienced any episode of diarrhoea, respiratory illness or skin infection in the last two months. The remaining 202 households were surveyed, 100 in Delhi and 102 in Mumbai, India's two largest cities. A total of 936 individuals resided in the surveyed households, resulting in a mean household size of 4.63 individuals (standard deviation (SD) 1.41). Household members ranged in age from 0-90 years old.

Monthly household income was collected in eight categories: <Rs. 4001-5000; Rs. 5001-7000; Rs. 7001-8000; Rs. 8001-10000; Rs. 10001-15000; Rs. 15001-20000; Rs. 20001-25000; Rs. 25000+. Monthly household income is a reported amount. In India it is expected that income may be higher these data reflect. A smaller proportion of monthly income is spent on food and rent in households with higher incomes than in those with lower incomes (table 1).

Table 1. Monthly income of participating households and mean amount (and proportion of monthly income) spent on rent and food (N=201)

Income Bracket (Rs.)	N	% of households	Mean amount spent on rent (Rs.)	Proportion of monthly income	Mean amount spent on food (Rs.)	Proportion of monthly income
Rs.4001- Rs.5000	5	2.5	2000	44%	3300	73%
Rs.5001-Rs.7000	5	2.5	2100	35%	3500	58%
Rs.7001-Rs.8000	2	1	2000	27%	5250	70%
Rs.8001-Rs.10,000	18	8.9	2205	25%	5306	89%
Rs.10,001-Rs.15,000	25	12.4	2771	22%	5400	43%
Rs.15,001-Rs.20,000	50	24.8	2917	17%	5530	32%
Rs.20,001-Rs.25,000	66	32.7	3820	17%	7515	33%
Rs.25,001+	30	14.9	4050	12%	10345	30%

One household did not supply information on income.

*Data on the amount a household spends on rent and food were collected in categories. The mean of each category of income spent on rent and food (e.g. Rs. 2500 for a category Rs 2000 – Rs. 3000) was assigned to all values in that category and used to calculate the mean amount spent on rent and food in each income bracket. To calculate the proportion of the monthly income spent on food and rent the mean value of each monthly income category was used e.g. Rs. 4500 for income bracket Rs. 4001- Rs5000. For Rs 25,001+ a value of Rs. 35,000 was used. Proportion of monthly income spent on rent for those with a monthly income of Rs. 4001-Rs. 5000 is therefore $(2000/4500)*100$. As data on income spent on food and rent were captured in separate categories the calculated proportions of monthly income spent on these items are merely illustrative and occasionally total greater than 100% of the monthly income.*

Overall, 36 households (18%) have a health insurance policy. Of these 36 households, 12 (33%) claim up to 75-100% of health expenses, 2 (6%) claim 50-75%, 6 (17%) claim 25-50% and 16 (44%) claim fewer than 25% of health expenses.

Households were classified based on socio-economic status using the number of assets owned by the household and the education level of the chief wage earner in the household¹. The categories of socio-economic status range from A1 (highest) to E3 (lowest). In this population no household was classified below C1, indicating that the majority of households were of relatively high socio-economic status (table 2).

¹ This classification is commonly used by Lifebuoy.

Table 2. Socio-economic classification of households (N=202)

Socio-economic category	N	% of households
A1 (highest)	28	13.9
A2	73	36.1
A3	60	29.7
B1	23	11.4
B2	16	7.9
C1 (lowest)	2	1

Socio-economic classification was based on an asset index and education level of main wage earner. No households were classified below C1 (the lowest category is E3).

PREVALENCE OF ILLNESS

The majority of respondents felt that respiratory is more common in their family and the wider community than diarrhoea and skin infections (83% and 86% of respondents respectively).

Overall, 408 episodes of illness were experienced by the 936 members of the 202 surveyed households in the last two months. Respiratory illnesses were most common (n=205, 50.3%), followed by diarrhoeal diseases (n=109, 26.7%) and skin infections - rash, blister or prickly heat (n=94, 23.0%).

Including households that were approached and eligible because they had a child under 12 but ineligible because they had had no illness (n=75), and assuming that these households would have been the same size as the surveyed population (4.63 members per household), the prevalence of illness in the two month recall period was calculated². This enables prevalence to be reported for the wider population:

- Overall prevalence of illness (diarrhoea, skin infection or respiratory illness) = 31.8%.
- Prevalence of diarrhoeal diseases = 8.5%
- Prevalence of skin infections = 7.3%
- Prevalence of respiratory illness = 16.0%

Episodes of illness occurred among individuals of all ages but note that the prevalence of illness varied strongly by age, a result which is observed in epidemiological studies almost everywhere (table 3).

Table 3. Prevalence of illness by age group

age (years)	DD	skin	respiratory	all
0 to 4	11.8%	16.8%	38.4%	67.0%
5 to 15	12.4%	13.2%	30.9%	56.5%
16 to 55	4.2%	5.0%	5.6%	14.8%
56 plus	3.8%	4.7%	3.8%	12.3%

² Prevalence calculation: Denominator = 202 (202*4.63) + (75 dropped because of no disease *4.63) = 935+347 = 1283. Prevalence = 408/1283 = 31.8%

DIRECT COSTS OF ILLNESS

Direct costs assessed:

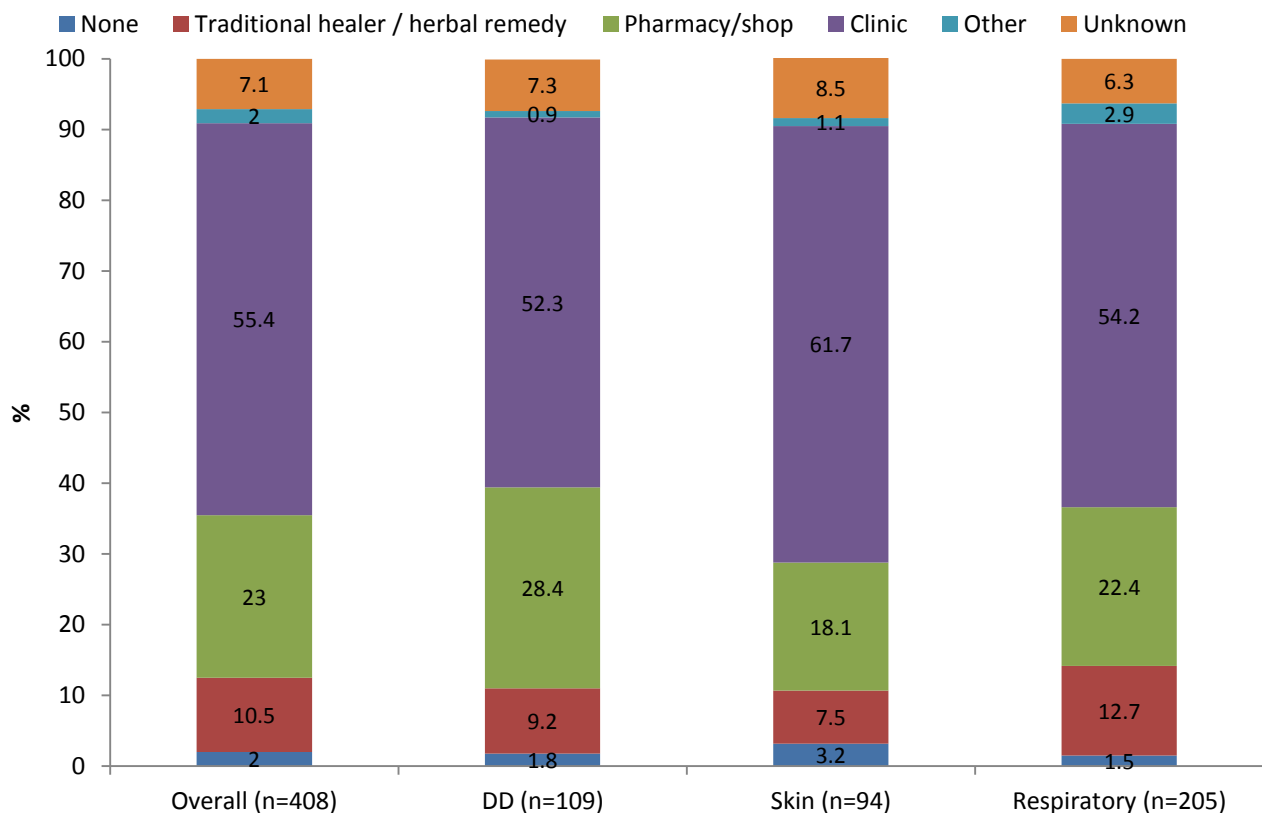
- Treatment
- Medicines
- Transport to receive treatment (includes costs of any accompanying family members)
- Accommodation while receiving treatment (includes costs of any accompanying family members)
- Other costs not already captured

All US\$ amounts quoted in this report are based on an exchange rate of 1 USD to 55.53 INR (www.currencyconverter.com; 29th May 2012).

Treatment type

Some form of treatment was sought for 400/408 (98.0%) of illness episodes. Of the 400 episodes of illness that were treated in some form, 41 episodes were treatment in more than one way (e.g. clinic and pharmacy). For the purpose of this analysis, only the first treatment for each episode of illness is included in calculations. Half the episodes of illness involved a visit to a clinic (226/408; 55.4%). Visiting a pharmacy or shop was the second most common form of care seeking for illness (94/408; 23.0%), followed by obtaining herbal remedies or other treatment from a traditional healer (43/408; 10.5%). The type of treatment sought did not vary significantly for each type of disease ($P=0.563$) (figure 1).

Figure 1. Type of treatment sought, by disease type



Other treatments (n=8) included 4 visits to a dispensary, 2 to a community centre and 2 to a hospital (as an outpatient). Treatments where a treatment type was incorrectly specified are described as "Unknown".

Treatment costs

Only 2 of the 43 episodes of illness treated by a traditional healer involved payment (Rs. 40 and Rs. 100), (reflected in the low mean of Rs. 3 given in table 1). Thirty-nine percent of pharmacy treatments required payment ranging from Rs. 50 to 400, while all except 4 clinic treatments required payment (range Rs. 30 to 1000). The eight other types of treatment were low cost (5 had no cost, one cost Rs. 10 and two cost Rs. 100). While it is possible that certain treatments were really associated with no cost, but it is more likely that this has been incorrectly recorded. The mean cost of treatment of the 293 episodes of illness with a recorded cost of treatment was Rs. 168. (SD = Rs. 145). Table 4 lists the mean cost of each type of treatment sought. The mean overall cost of treatment for an episode of illness (including episodes with no treatment or no associated cost (or no cost recorded) was Rs. 121 (US\$2.18). Costs for diarrhoeal episodes, skin infections and episodes of respiratory illness were similar.

Table 4. Mean cost of treatment for an episode of illness (N=408 illness episodes)

		Any illness episode Rs. (SD)	Diarrhoea Rs. (SD)	Skin infection Rs. (SD)	Respiratory illness Rs. (SD)
Cost of TREATMENT sought by type of illness episode in Indian Rupees (RS.)	None (n=8)	0	0	0	0
	Traditional / Herbal Remedy (n=43)	3 (16)	23 (43)	0	5 (21)
	Pharmacy/shop (n=94)	50 (79)	127 (92)	38 (51)	73 (99)
	Clinic (n=226)	162 (122)	0	209 (123)	156 (127)
	Other (n=8)	26 (46)	0	0	35 (51)
	Unknown (n=29)	259 (288)	243 (139)	0	269 (376)
Overall cost treatment (n=408)		121 (144)	91 (104)	158 (152)	120 (155)

SD = standard deviation.

Medication costs

Overall, 294 episodes (72.1%) required some form of medication. Costs ranged from Rs. 5 to Rs. 2000. The mean cost of medication for these 294 episodes was Rs. 165 (SD Rs. 183). The mean cost of medication for any episode of illness (therefore including episodes where medication was not purchased) was Rs. 119. (SD Rs. 172) (table 5).

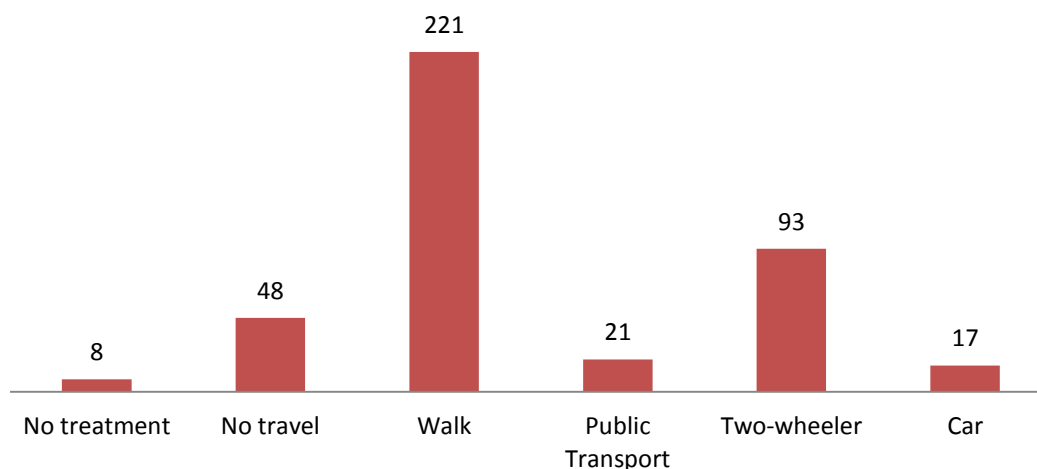
Table 5. Mean cost of medication for an episode of illness (N=408 illness episodes)

	Any illness episode Rs. (SD)	Diarrhoea Rs. (SD)	Skin infection Rs. (SD)	Respiratory illness Rs. (SD)
Cost of MEDICATION sought in Indian Rupees (Rs.)	119 (172)	137 (120)	99 (126)	122 (210)

Travel type

The majority of the 400 episodes of illness that were treated needed travel (352/400 = 88%). Treatment of these episodes was typically accessed on foot (221/400=55.3%). Transport modes are detailed in figure 2.

Figure 2. Type of transport used to receive main treatment



Travel costs

Episodes of illness which required no treatment, no travel, or travel by foot did not incur any travel costs. Of the 161 treatments accessed by public transport, a two-wheeler, or a car, 101 did not incur (or did not report) any associated transport costs. It is possible that cost of using a car or two-wheeler may not have been considered by a respondent who did not factor in the cost of fuel. However, 9 of the 21 public transport users did not report a cost. Reported travel costs ranged from Rs. 10 to Rs. 60 for public transport, from Rs. 10 to Rs. 80 for a two wheeler and no costs were reported for car travel. The travel costs reported in table 6 are for 59 episodes of illness, hence the overall transport cost for an episode of illness is negligible at Rs. 3 (US\$ 0.05). It is very likely that travel costs are underestimated.

Table 6. Mean cost of travel to receive treatment by type of travel (in Indian Rupees)

	Any illness episode, Rs. (SD)	Diarrhoea, Rs. (SD)	Skin infection, Rs. (SD)	Respiratory illness, Rs. (SD)
No treatment	0	0	0	0
No travel	0	0	0	0
Walk	0	0	0	0
Public Transport	16 (17)	8 (10)	13 (16)	19 (19)
Two-wheeler	10 (23)	5 (18)	8 (23)	14 (24)
Car	0	0	0	0
Mean overall travel cost	3 (12)	1 (8)	3 (13)	4 (14)

Those with no travel cost because they had no treatment, did not travel to receive treatment or travelled by foot (n=277) are included as zero cost in the calculation of the mean overall cost of transport per episode of illness. Episodes with transport but no reported cost (n= 101) are also included as zero costs for the purpose of the calculation.

Accommodation Costs

Only 3 illness episodes required family members to pay for any accommodation. The costs were almost negligible, at Rs. 200, 600, and 800.

Other Costs

No other costs were reported associated with illness other than those already described.

INDIRECT COSTS OF ILLNESS

Indirect costs assessed:

- Value of work days lost due to illness
- Value of work days lost due to caring for an ill family member
- Days of school lost due to illness or caring for an ill family member (*not included as a monetary cost*)
- Value of time lost due to travelling to receive treatment

School / work days lost by patient

Overall, 65.0% of episodes (265/408) resulted in an absence of one or more days of work or school. Assuming that those aged 16 or over missed work and those under 16 missed school, three quarters of these episodes (201/265) resulted in lost schooling. On average, among those who lost work or school, 3.5 days were taken off work (range: 1 to 15) and 3.3 days were taken off school (range: 1 to 15) as a result of illness (table 7). Per episode of illness an average of 2.2 days of school or work were lost (as not all episodes were associated with a day off), 2.3 days of school and 2.0 days of work.

Missing work as a result of illness was calculated³ to be associated with the loss of a mean of Rs. 3252 (US\$ 58.52) among the 64 episodes that resulted in time off work. As the majority of episodes were among children or did not require a patient to take time off work, the mean value of working days lost by a patient as a result of an illness episode was Rs. 510 (US\$ 9.18).

School / work days lost by caregiver

In total, 92.9% (379/408) of illness episodes involved a caretaker, almost always a family member (358/379; 94.5%). Four episodes were cared for by a neighbour and outside help was employed for 17 episodes (cost unknown). The majority of episodes (290/358 =81.0%) cared for by a family member did not require them to miss any work or school.

Unlike patient days off work or school, data on whether a carer lost work or school were available and no assumptions needed to be made based on the age of the carer. Of the 358 episodes where a family member cared for a sick relative, 43 episodes (12.0%) resulted in a carer missing work, on average, 2.2 days of work (range: 1 to 15 days) which corresponded to a monetary value of Rs. 1777 (US\$ 31.99). As the majority of episodes did not require a carer to take time off work, the mean value of working days lost by a carer as a result of an illness episode was Rs. 187 (US\$ 3.37).

School was missed while caring for a sick relative in 25 (7.0%) episodes. Caretakers caring for a relative during these 25 episodes of illness missed an average of 2.5 days of school (range 1 to 10 days) (table 7).

Family members who cared for a sick relative missed work or school during 68 of the 358 episodes they cared for, a total of 0.38 lost days of productivity on average for an episode of illness.

Table 7: Mean (SD) days of school and work lost by patient and caregivers per episode of illness

	Any infection	Diarrhoea	Skin Infections	Respiratory Illness
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Days of work lost by patient (N=64)	3.47 (2.70)	2.64 (2.33)	4.21 (2.37)	3.80 (3.24)
Days of work lost by carer (N=43)	2.16 (2.29)	2.85 (3.20)	1.57 (0.79)	1.56 (0.51)
Days of school lost by patient (N=201)	3.34 (3.06)	2.95 (2.84)	3.47 (2.17)	3.51 (3.42)

³ Calculated from monthly income, assuming a five-day working week in a month of 30 days (21.4 working days). The mean value of each monthly income category was divided by the 21.4 working days to calculate the daily wage rate. A value of Rs. 35,000 was chosen to represent the upper-most income bracket (Rs. 25,000+) as exact income was unknown. Daily wage rate ranged from Rs. 210 to Rs. 1636 (US\$ 3.78 to US\$ 29.45) and the mean daily wage rate was Rs. 918 (US\$ 16.52). Daily wage was multiplied by days off work to assign a monetary value to this lost time.

Days of school lost by carer (N=25)	2.52 (2.06)	1.0	2.0 (1.41)	2.71 (2.17)
--	-------------	-----	------------	-------------

Values in this table are the mean number of days lost among **only** those episodes associated with a day off work or school and therefore do not reflect the mean number of days off for an episode of illness (the value of which would be much lower as would include all the episodes for which no days of work or school were lost).

Time lost due to travel

The mean one-way travel time to receive treatment was 11 minutes, ranging from 0-80 minutes. The mean cost associated with time spent travelling by a family for an episode of illness was Rs. 52.64 (US\$ 0.95)⁴.

COST OF AN EPISODE OF ILLNESS

Using the direct and indirect costs described above, the overall cost of an episode of illness was computed. The mean overall cost of an episode of illness was Rs. 997 (US\$ 17.95). Costs varied by type of infection (table 8).

Table 8. Mean cost of an episode of illness in Indian Rupees (Rs.), by illness type (N=540 episodes of illness)

	Any infection Mean (SD) Rs.	Diarrhoea Mean (SD) Rs.	Skin Infections Mean (SD) Rs.	Respiratory Illness Mean (SD) Rs.
Direct Costs				
Treatment				
None (n=8)	0	0	0	0
Traditional / Herbal Remedy (n=43)	3 (16)	23 (43)	0	5 (21)
Pharmacy/shop (n=94)	50 (79)	127 (92)	38 (51)	73 (99)
Clinic (n=226)	162 (122)	0	209 (123)	156 (127)
Other (n=8)	26 (46)	0	0	35 (51)
Unknown (n=29)	259 (288)	243 (139)	0	269 (376)
<i>Sub total for any treatment</i>	121 (144)	91 (104)	158 (152)	120 (155)
Medicine	119 (172)	137 (120)	99 (126)	122 (210)
Transport costs	3 (12)	1 (8)	3 (13)	4 (14)
Accommodation costs	4 (50)	7 (77)	6 (62)	1 (14)
Other costs	0	0	0	0
<i>Total for direct costs</i>	247 (293)	199 (221)	305 (250)	246 (339)
Indirect Costs				
Estimated value of work days lost by patient	510 (1758)	551 (1734)	731 (2037)	387 (1625)
Estimated value of work days lost by carer	187 (809)	332 (1281)	137 (607)	133 (505)
Estimated value of travel time	53 (53)	49 (48)	52 (65)	55 (49)
<i>Total for indirect costs</i>	750 (1909)	933 (2091)	920 (2089)	575 (1705)
Total Costs	997 (1979)	1131 (2139)	1224 (2118)	821 (1811)

All values are calculated based on 408 episodes of illness, hence standard deviations can be large when few episodes were associated with a cost.

Cost calculations do not include the instances where more than one treatment was sought. Transport costs are included when provided and include costs for other family members travelling with the patient. Those travelling by car and motorbike more often indicated there was zero cost associated with transport so travel costs may be slightly underestimated.

Indirect cost estimates are given for absences from work (of patient and carer) and time lost due to travelling only. Assigning a monetary value to missing school days is arbitrary and may only succeed in over-inflating cost estimates therefore only work days lost have been included in calculations.

⁴ Travel time calculation: used the daily wage rate, mean travel time = 0.36 hrs (11 minutes one way) and number of accompanying family members.

Calculation of indirect costs. Days of work lost by patient: as data were not available on whether absences were from school or work, all absences among patients aged 16 and over were considered to be from work and were assigned a monetary value. Using the mean value of each monthly income category a daily wage rate could be calculated assuming a five-day working week in a month of 30 days. Days of work lost by carer: data were available on whether carer lost time from work or school. The daily wage rate was applied to calculate a monetary value for time lost due to caring for an ill family member. Travel time: calculated using mean travel time of 11 minutes (22 minutes return journey) and daily wage rate, and multiplied by number of accompanying family members.

The cost of an episode of illness can be extrapolated back to the general population by multiplying costs by the prevalence of illness (table 9).

Table 9. Cost of illness in Indian Rupees (Rs.), by illness type (N=408 episodes of illness) in general population

	Any infection	Diarrhoea	Skin Infections	Respiratory Illness
Total Costs	317.1	96.2	89.4	131.4

Cost extrapolated to India as a whole using cost of an episode of illness and prevalence of illness = 31.8%; diarrhoea = 8.5%; skin infections = 7.3%; respiratory illness = 16.0%

HOUSEHOLD COST OF ILLNESS

The overall cost of illness per household was Rs. 1469 (US\$26.43) (table 10). This cost is for the **two month period** during which data collection took place and takes account of the fact that 14 households experienced no illness in the preceding two months⁵. As the incidence of illness varies at different times of year this cost would be likely to vary over the course of a year. However, a crude estimate of the annual cost of illness due to diarrhoea, respiratory illness and skin infections can be obtained by multiplying household costs in preceding two months by six (table 10).

The overall **annual cost of illness per household** was Rs. 8814 (US\$ 158.65). As this estimate is made among households with children aged 12 years and younger it may well be an overestimate of the actual costs in the average household.

Table 10. Mean cost of illness per household in Indian Rupees (Rs.)

	Any infection Mean Rs.	Diarrhoea Mean Rs.	Skin Infections Mean Rs.	Respiratory Illness Mean Rs.
Total Household cost (in preceding two months)	1469	445	416	608
Total Annual Household Cost	8814	2670	2496	3648

SEASONS

Respondents were questioned about the occurrence of illness at certain times of year: rainy/monsoon season; summer season; winter season and when children go back to school after the holidays. Illness was believed to be most prevalent during the rainy season (Table 11).

Table 11: Extent to which respondent believes children suffer from more illness at certain times of year (N=202)

⁵ Calculation: (cost (sum of cost of all illness episodes in a household divided by number of episodes of illness) * 202 households) / 277 households (total approached, 75 households with no illness)

	Rainy /Monsoon Season		Back to School Season		Summer Season		Winter Season	
	No. Households	(%)	No. Households	(%)	No. Households	(%)	No. Households	(%)
No more illness	147	72.8	172	85.1	173	85.6	153	75.7
More illness	55	27.2	30	14.9	29	14.4	49	24.3

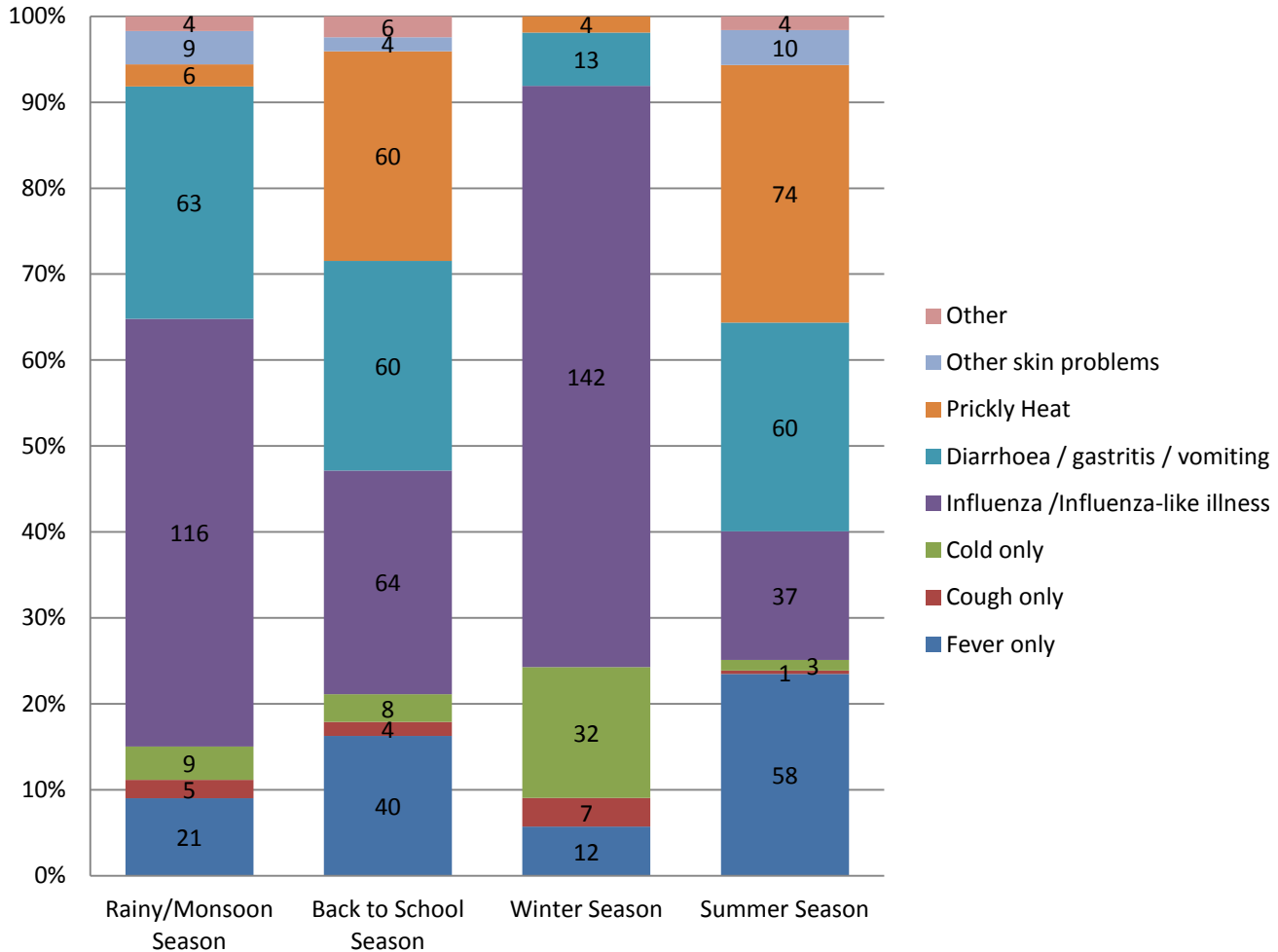
Households were asked which common illnesses occur during each of these seasons/times. The relative frequency of occurrence of different illnesses can be viewed in Table 12. A graphical summary of the key groups of illnesses mentioned is displayed in figure 3 below.

Table 12: Common illnesses at different times of year as reported by respondents (N=202 households)

	Rainy /Monsoon Season		Back to School Season		Winter Season		Summer Season	
	No.	% Households	No.	% Households	No.	% Households	No.	% Households
Fever	21	9.0	40	16.3	12	5.7	58	23.5
Cough	5	2.1	4	1.6	7	3.3	1	0.4
Cold	9	3.9	8	3.3	32	15.2	3	1.2
Cough, cold, fever	55	23.6	30	12.2	49	23.3	29	11.7
cough, cold	28	12.0	18	7.3	56	26.7	1	0.4
cold, fever	19	8.2	13	5.3	19	9.0	1	0.4
cough, fever	9	3.9	2	0.8	2	1.0	2	0.8
Flu / strep throat	0	0.0	0	0.0	0	0.0	1	0.4
Sinus	1	0.4	0	0.0	0	0.0	0	0.0
Cold, sinus	3	1.3	1	0.4	11	5.2	1	0.4
cold, sinus, cough, headache	1	0.4	0	0.0	5	2.4	2	0.8
Diarrhoea / gastritis	50	21.5	42	17.1	11	5.2	38	15.4
V and D	4	1.7	14	5.7	0	0.0	16	6.5
Dizzy / headache	1	0.4	2	0.8	0	0.0	1	0.4
Prickly Heat	6	2.6	60	24.4	4	1.9	74	30.0
Rashes	0	0.0	0	0.0	0	0.0	5	2.0
Skin problems	2	0.9	2	0.8	0	0.0	0	0.0
itching, boils	1	0.4	0	0.0	0	0.0	2	0.8
Stomach upset	8	3.4	3	1.2	2	1.0	5	2.0
Vomiting	1	0.4	1	0.4	0	0.0	1	0.4
Blisters	6	2.6	2	0.8	0	0.0	3	1.2
Sun stroke	0	0.0	4	1.6	0	0.0	0	0.0
Malaria	2	0.9	0	0.0	0	0.0	3	1.2
Chichungunya	1	0.4	0	0.0	0	0.0	0	0.0

Households could list up to three common illnesses that occur at each specified time. Denominators therefore vary for each time of year.

Figure 3. Frequency (%) common illnesses are reported to occur among children in surveyed households at different times of year (N=202)



Households could list up to three common illnesses that occur at each specified time. Denominators therefore vary for each time of year. Reported frequencies are a percentage of all illnesses mentioned. Other skin problems include rashes, boils and blisters. Other ailments includes dizziness, sun stroke, malaria and chichungunya

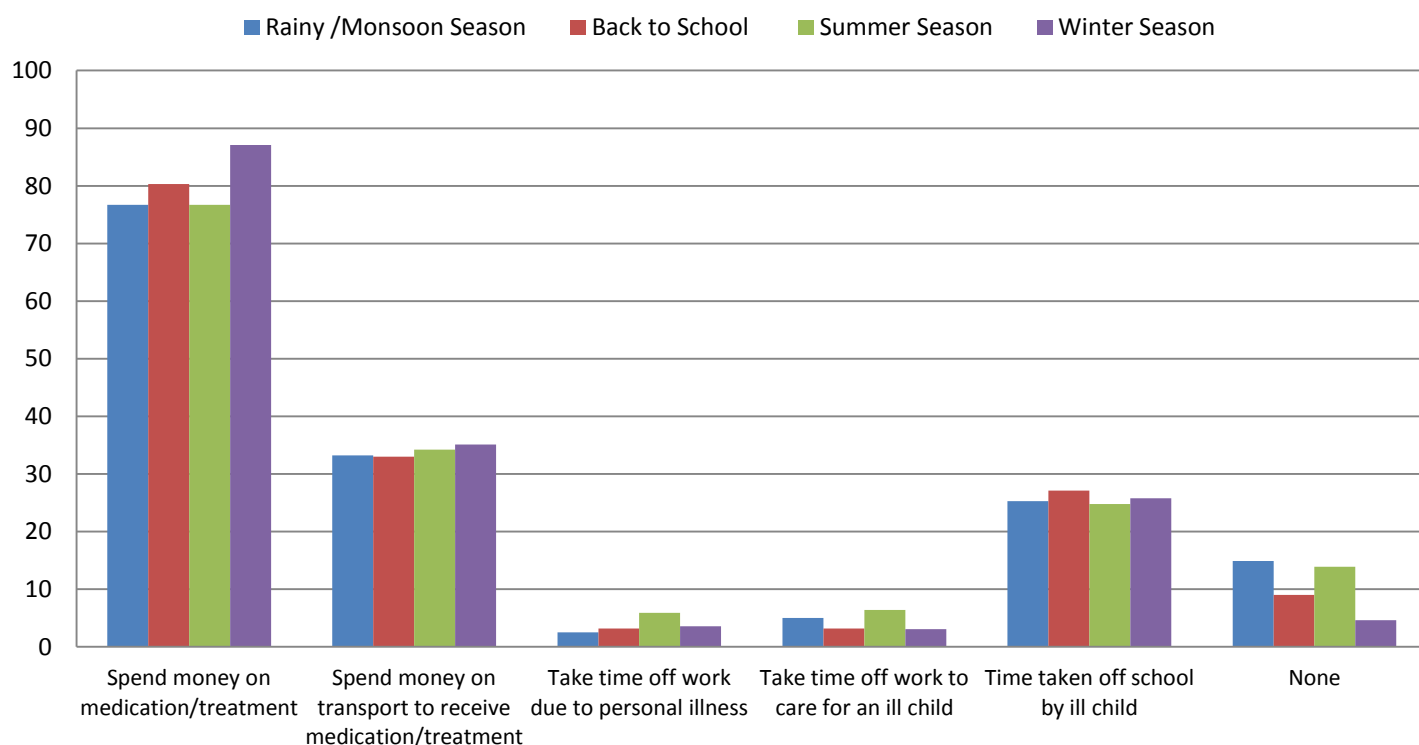
Respondents were asked a number of questions about the way in which illness affects their household during different seasons (table 13). Respondents all agreed they spend money on medication and treatment during the four time periods, particularly during the Winter season. This is in line with findings that the total costs associated with influenza were the highest and the most common illness in Winter is Influenza. Few respondents commented that illness at these times would cause them to take time off work due to personal illness or to care for an ill child, also in line with COI estimates.

Table 13. Ways in which a household is affected by illness during different seasons

	Number (and %) of households affected by season (N=202)			
	Rainy Season	Back to School	Summer Season	Winter Season
Spend money on medication/treatment	155 (76.7%)	151 (80.3%)	155 (76.7%)	169 (87.1%)
Spend money on transport to receive medication/treatment	67 (33.2%)	62 (33.0%)	69 (34.2%)	68 (35.1%)
Take time off work due to personal illness	5 (2.5%)	6 (3.2%)	12 (5.9%)	7 (3.6%)
Take time off work to care for an ill child	10 (5.0%)	6 (3.2%)	13 (6.4%)	6 (3.1%)
Time taken off school by ill child	51 (25.3%)	51 (27.1%)	50 (24.8%)	50 (25.8%)
Not affected	30 (14.9%)	17 (9.0%)	28 (13.9%)	9 (4.6%)

This data is presented graphically in figure 4.

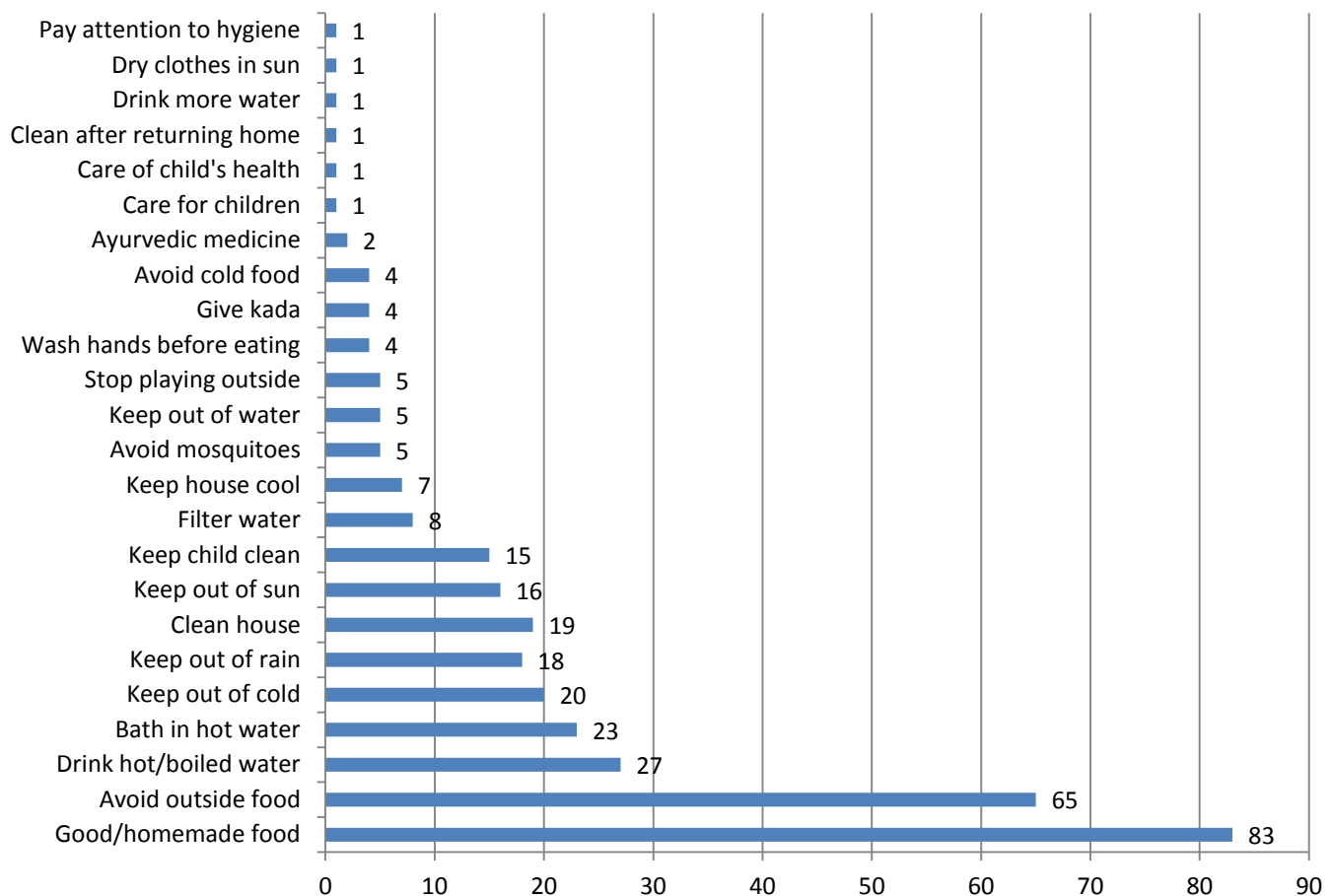
Figure 4. Ways in which a household is affected by illness during different seasons



PERCEPTIONS

94% (190/202) of respondents believe they can do something to stop their children from falling ill. Many respondents mentioned that they can do more than one thing (336 reasons given by the 190 respondents). All ways mentioned were coded and displayed in Figure 5. The most frequent way in which mothers believe they can stop their children from falling sick is to give good, homemade food (often described as green vegetable, hygienic food and not junk food) and to prevent the child from consuming food bought outside the home (e.g. because from markets where the oil isn't good). The majority of other responses related to the weather and keeping the child out of the sun, rain or cold.

Figure 5. Ways in which respondents believe they can prevent children falling ill



Respondents often volunteered multiple ways in which they can prevent their children from falling ill. This figure shows a simple summary of the frequency in which different items were mentioned. Keeping the child out of the water could refer to keeping the child from swimming or keeping the child out of the rain – this is unclear. Kada is a type of food. A number of responses were unclear and have not been coded (e.g. “maintain cleanliness” could refer to the house, the food, or the child).

Almost all respondents (n=180/202, 89%) worry that their child's education will be impacted if they are off school due to sickness. 59% (119) worry a lot and 30% (61) worry somewhat.

Half the respondents (n=97/202, 48%) think their children fall sick more frequently than when they were children.

Almost no respondents (1%, n=13) think they spend a lot on medicine and treatment nowadays.