HPG Report

Counting the cost

Assessing the cost of ill-health in West Darfur, Sudan

Simon Levine and Agata Kusnierek

March 2019

HPG Humanitarian Policy Group

VALID EVALUATIONS

IDS Institute of Development Studies

ODI

About the authors

Simon Levine is a Senior Research Fellow at the Humanitarian Policy Group, where he specialises in resilience and livelihoods in crises. This study was completed while he was working as a research consultant with Valid Evaluations.

Agata Kusnierek is a specialist in survey design and data analysis, working with Valid Evaluations.

Acknowledgements

This study was financed as part of an overall study of multiyear humanitarian finance by DFID, through the Humanitarian Innovation and Evidence Programme (HIEP).

Thanks to Dr Khaled Abdelsalam and to the Academy of Health Science for support with the implementation of the survey.

The views expressed in this paper are those of the authors alone, and are not necessarily shared by DFID or by those who supported the field research.

Contents

Tables

Tables

Acronyms

DRC	**Democratic Republic of Congo**
MYHF	**Multi-year humanitarian financing**
NHI	**National health insurance**
OOP	**Out-of-pocket**

Executive summary

Introduction

During Valid Evaluations' four-year study of multi-year humanitarian financing (MYHF), ill-health repeatedly emerged as a factor keeping people in poverty and vulnerability. Despite the importance of this issue, there is a lack of information on the economic cost of ill-health for households. Isolated studies have quantified the direct costs of a visit to a clinic, but no specific studies are available for Sudan or the Democratic Republic of Congo (DRC) that aggregate the full economic impact of illness. This makes policy development a real challenge. In response to this lack of data, Valid Evaluations has undertaken two stand-alone studies on the subject: one in West Darfur, the subject of this paper; and a study in North Kivu, DRC, published separately.

Methodology and approach

For this study, data was collected in the five villages where Valid Evaluations has conducted research for the overall MYHF evaluation. In all, 331 households were randomly sampled and quantitative data collected on household demographics, the prevalence of ill-health over the previous 12 months for all members of the household and healthcare-seeking behaviour in each case of ill-health. Interviews were conducted at the end of November and early December 2017. Detailed costs were collected for all healthcare visits (Western, traditional and spiritual/religious) relating to one episode of ill-health from the respondent and for one child in the household. Total annual costs for the household were extrapolated from the costs for one adult and one child. These costs included direct costs (for consultations, tests and drugs), the indirect costs of accessing healthcare (transport, food, accommodation, etc.), other miscellaneous costs (unofficial charges, gifts, special foods, etc.) and the opportunity cost of labour lost to ill-health, whether as a patient or carer.

This paper differs from previous studies quantifying health costs in two ways. First, the cost of ill-health is defined more broadly than the usual definition of out-of-pocket (OOP) expenditure (i.e. direct expenditure on healthcare). The costs of ill-health include these direct costs (for consultation, tests and drugs), but also the indirect costs of accessing healthcare (e.g. transport) and potential income lost because of ill-health.

Second, the data are treated in non-standard ways. The variation in health costs faced by households is highly skewed to large amounts, and so mean/average data do not present an accurate picture of what most households would expect to pay for healthcare.[1] Alongside the standard statistical treatment based on means, this paper uses the data to construct more typical pictures, using hybrid calculations often including median values. Although based entirely on quantitative data, this paper aims to be easily accessible for those interested in livelihoods and health, even those without any familiarity with statistics.

Findings

The costs of healthcare varied greatly across the five villages, being three times higher in the worst village (i.e. where costs were highest) than in the best (where costs were lowest). Costs were higher for three main reasons: direct costs for each visit, the cost of accessing treatment and disease incidence were all higher. This third factor has the greatest economic impact as it resulted in a greater need for healthcare and an increased number of working days lost due to ill-health.

Individuals typically fell sick between once and twice a year. In over 90% of cases, Western healthcare was sought, either in the form of self-medication with purchased drugs or by a visit to a clinic. A typical (median) household, with three adults and three children, made between five and six trips a year outside their village from Dorti, Faiga and Nur al Huda villages and between nine and ten trips a year from Haraza or Hasabona villages. Illness rates were 50% higher in the latter group of villages and availability of drugs for self-medication was lower,

1 If there were a normal, bell-shaped, distribution of costs, then the average would be the same as both the median value and the mode (i.e. the most common value).

resulting in a higher percentage of cases of sickness requiring a trip to a clinic outside the village. Median households could expect to spend $40–50 p.a. directly on healthcare ('OOP health expenditure') in the first three villages, and $160–170 p.a. in the latter two.

In addition to these direct costs, there were also indirect costs (accessing healthcare, transport and food for patients and carers) of $60–90 p.a. in the first three villages and $180–210 in the latter two.

The third significant cost relates to lost income whilst unable to work, whether as a patient or as a carer. In those villages where disease prevalence was lower and access easier, the typical household lost around 5% of its total working capacity. However, where disease prevalence was higher and healthcare less accessible, around 14% of total working capacity was lost. Applying a monetary cost to those days lost due to illness requires reliable information on annual household income. As no publicly available document provides information on household income in Darfur over the past decade – a significant information gap – we used data from Valid Evaluations' own longitudinal research to estimate a typical annual income of $1,500 for a household of three adults in the absence of ill-health.

The annual cost of lost income on households was similar to the indirect expenditure and slightly higher than the direct healthcare and indirect expenditure – around $75 in the village with the lowest burden and $210 in the village with the highest burden. The total economic cost of ill-health for a typical household, in the absence of any untypical (i.e. serious) ill-health, therefore totalled around $225 p.a. in the lowest cost village and over $600 in the highest cost village. This constituted the equivalent of a 'sickness tax' of between 15% and 40% of annual potential income.

The availability of health insurance increased rapidly in all villages between 2013 and 2016. Around three-quarters of households were registered with health insurance schemes in the three villages with lower health costs, and around a third in the villages with higher health costs. The insurance system is currently financed by the Ministry of Social Welfare and not by contributions from those registered, though it is anticipated that, over time, there will be an incremental move to financing the insurance system from insurance premiums. Despite being free, the benefits of the scheme were limited. Insurance only brings cost reductions for direct (OOP) expenditure and does not mitigate indirect costs or income lost due to illness. The data showed that the typical saving from health insurance for a registered household was around $20 p.a. in one of the higher-cost villages, just 3–4% of the total economic cost of ill-health.

Once premiums are levied, the benefits will be even more limited. Insurance is a mechanism for cost-sharing but does not protect people from costs that are shared by almost everyone. To be sustainable, the average cost of insurance cannot be lower than the average cost of healthcare. Insurance may help shield those who suffer very expensive ill-health in the year, but unless a high subsidy from government remains, insurance premiums would have to be considerably higher than the typical costs outlined in this paper, which are still considerably below average (mean) costs.

Catastrophic health costs, which affected a small number of households only, were beyond the terms of reference of this study, and the number of cases in the overall sample is too small to make any statistical analysis.

Conclusions

The economic burden of ill-health is extremely high in relation to annual income. Even where a household has no particularly serious health problem, sickness costs around $250–600 per year, depending on where they live – between 15% and 40% of their potential annual household income. Most households were forced to sell some assets (mainly crops and livestock) to cover direct healthcare expenditure.

Direct costs make up only around a third of the burden of ill-health. Policy- and decision-makers from both the health and livelihoods domains must bear in mind the overall cost of ill-health rather than focusing narrowly on OOP health expenditure. This has several implications. Free or subsidised healthcare only addresses one third of the economic burden. Making healthcare more accessible at village level would help address indirect health expenditure. Reducing sickness through preventative strategies would potentially reduce the cost of ill-health by addressing all three components of the cost, including lost income.

The benefits of health insurance for most people from a cost perspective is very small, not more than around 5% of the economic cost of ill-health. Health insurance may have much greater benefits in sharing the costs of catastrophic charges, but these were not studied.

There are sizeable methodological challenges to painting an informative picture of the economic burden of healthcare. Because the distribution of costs is so skewed, average figures from quantitative research need to be treated with caution if presented as a picture of the reality affecting a majority of households. The approaches used in this paper offer an alternative that captures the impact of ill-health on the economic lives of 'typical' households.

The implications of these conclusions will be analysed further in Valid Evaluations' final report for the multi-country thematic evaluation of MYHF.

1 Introduction

Valid Evaluations is undertaking a four-year thematic study for DFID of the potential benefits of managing humanitarian funding over multi-year timeframes. In particular, the study is examining how MYHF can help address underlying causes of vulnerability and so help to build resilience in Sudan, Pakistan, Ethiopia and DRC. Within this overall piece of work are separate studies that focus on particular themes identified by the main fieldwork. This paper, on the economic costs of ill-health, is one of those studies. A parallel study has been conducted in North Kivu, DRC, and is published separately.

The role of ill-health in maintaining people in poverty has been seen in several countries but its economic cost has rarely been studied. No documents were publicly available that made any attempt to quantify the economic burden of sickness in Sudan, or in the other countries studied. Such information is essential to inform health policy as well as policy on tackling poverty and vulnerability and promoting resilience. This paper is a contribution to filling that evidence gap.

The paper quantifies the total economic burden of ill-health for households in West Darfur. The Government of Sudan has progressively rolled out a national health insurance (NHI) programme across the country since 1995. It is compulsory for workers in the formal sector to enrol, but the Government has also been extending voluntary enrolment to those outside the formal sector. Registration covers all members of the household. Employees and employers in the formal sector pay an insurance levy, but NHI is currently financed by the Ministry of Social Welfare for those outside formal employment in Darfur. It is anticipated that over time there will be an incremental move to financing the insurance system from insurance premiums. Those registered can receive free consultations in clinics covered by the scheme ('insurance clinics'), where they can also receive subsidised laboratory investigations. The scheme also sells drugs for 25% of the retail price through specific outlets, covering a wide range of medical conditions, investigations and drugs. This study also looks at the potential role of health insurance to mitigating the overall economic cost of ill-health but does not examine the workings of the insurance scheme or its costs to the state.

The quality of healthcare available was not investigated by the study as it is not an attempt to evaluate healthcare or health insurance in West Darfur. Its purpose is narrowly defined as quantifying the cost of ill-health.

2 Methodology

The study is based on quantitative analysis of healthcare spending of randomly sampled households. Data was collected in face-to-face interviews using a tablet-implemented questionnaire in November–December 2017. In total, 331 households were randomly sampled from the five villages in West Darfur where panel interviewing was already being conducted by VALID Evaluations for the overall thematic study. Although household selection was randomised within villages, the sample population does not constitute a random sample of the entire West Darfur population, because the villages were not randomly selected. These had been selected within the main MYHF study in order to represent a range of situations. Two villages were less affected by conflict and regarded as having higher economic potential (Haraza and Hasabona, with 160 respondents) and three villages are in border areas, more greatly affected by conflict (Faiga B, Nur al Huda, a village with a greater urban influence, and Dorti, a more purely rural village, with 171 respondents between them). The analysis that follows is largely at village level, though some sample-level analysis is conducted where there were no statistically significant differences between villages.

Respondents were asked in detail about all episodes of ill-health suffered by all members of their households since the previous harvest (a year earlier) and the healthcare-seeking behaviour in each case. It was not possible to use the survey instrument to collect detailed data on the costs for every trip for healthcare undertaken by all household members. There are two reasons why this was impossible. First, no single member of the household would necessarily have the information for the healthcare costs of all household members and second, detailed questioning about all the costs related to every trip for healthcare would have taken well over two hours, far too long an interview to expect answers to be reliable.[2] Instead, detailed costs were taken for the adult respondent and for one child in their household. Sixty-four per cent of respondents were women, and the data was disaggregated between men and women (and boys and girls). It was assumed that these would be broadly representative of the costs of healthcare trips taken respectively by all men and women, and all boys and girls, in the household. The household costs of ill-health can therefore be established with reasonable accuracy by combining the detailed costs from one adult and one child member of the household, together with the data on the prevalence of ill-health and the number of trips for healthcare made for all adults and all children.

Respondents were left to define ill-health for themselves as well as which household members they considered to be adults or children. It was found that the differences between sexes or between children over/under five did not justify a separate analysis,[3] and so the investigation that follows does not include gender disaggregation or disaggregation between children under and over five.

The study distinguishes between *expenditure* and costs. For the purposes of this paper, *expenditure* refers to money or in-kind payments made as a result of ill-health; costs refer to the economic burden of ill-health and comprise expenditure plus opportunity costs incurred by being sick. Total expenditure includes costs of transport for the patient and any companion, any overnight accommodation, food purchased while away, etc. The opportunity costs were established by collecting data on the number of working days lost by patients, by anyone accompanying someone sick to a clinic and anyone caring for a patient at home.

There were (statistically significant) differences between respondents' rates of sickness and that of other members of their households (this data is presented in the section Prevalence of Ill-health below). This discrepancy may exist because the people interviewed at home during the day were more likely

2 Once respondents become tired and bored, there is no reason to have any confidence in the answers they give. Collecting data that a researcher suspects would be unreliable is a dangerous mistake, if not unknown in practice. It is better to know where there are evidence gaps than to falsely believe that one had filled them and to draw conclusions from incorrect data. See Annex 1 for further explanation of the methodology, including the way in which typical values were reconstructed

3 There were no statistically significant differences in rates of sickness between boys and girls, or the kind of healthcare sought for them. Complications with pregnancy accounted for 2% of all reported ill-health.

to be sick than those absent from the house. This possible bias in the sample of respondents is removed from calculations by taking the data on the costs of healthcare for each sickness episode from respondents and combining it with the data on the prevalence of ill-health and on health-seeking behaviour only from other adults in the household.[4]

Average values do not always represent the reality of most households, especially where the distribution of values is highly skewed to one side – in this case, to higher values. Therefore, rather than presenting the average data on costs, this paper uses the data to reconstruct what it considers to be a typical situation for families (the various statistical techniques used are explained in each example). This has been done conservatively, so that costs expressed should be the least that families would expect to pay. In some cases, median costs are used instead of averages to remove excessive influence from rare but very costly cases.[5]

Ideally, the study would have collected data to establish the entire cost of ill-health for each household to present an overall annual median cost for households. However, as explained above, this was not possible. Hybrid calculations have therefore been used to create a value that would approximate this overall median cost. Such calculations are not standard practice in quantitative studies, but allow the paper to present a more accurate portrayal of the normal costs of ill-health faced by most households, who are fortunate enough not to need more serious medical attention.

Lost income due to sickness was calculated by establishing the total number of days that patients and carers were unable to work, to arrive at a total number of lost days' work per household for the year. This was converted into a percentage of the potential working days per year and the overall monetary value of the time lost per household was calculated. The calculation is explained in more detail in section 3.7. Previous primary research by Valid Evaluations from 2015–17 in the same villages was used in the absence of other available data for the province.

4 By removing data from the respondents in this way, the bias may be over-corrected. However, this is consistent with the approach of this paper to estimate costs as conservatively as possible.

5 The median is the middle value. Half of all cases are higher than the median and half are lower, but the value of the median is not influenced by how much higher or lower the other values are.

3 Findings

3.1 Demographics

Most households were of between three and eight people, with both a mean and median size of six – three adults and three children.

Adult/child categorisation was according to the respondents' own criteria: no definition of children or adults was offered by interviewers. The median age of the sample was 16. Since respondents identified 48% of the population as children, this indicates that 16 is locally perceived as roughly the age of transition to adulthood. This age is not a cut-off point for data in most population pyramids (see for example Table 2), suggesting that they do not quite correspond to the way age groups would be constructed locally. The average age of the sample was 17.

Table 2 shows that the population in the study area is somewhat younger than the national population: though there are as many older people, there are more under-tens but fewer in the 20–40 age range. Such an effect has often been found in conflict situations, including in Darfur (see Guha-Sapir and D'Aoust, 2010). The female:male ratio in the 20–40 age group was around 1.2:1, although age recall was not exact enough to give a precise figure.[6] Again, this corresponds to what we would expect from the population in Darfur (Ibid.). Overall, the demographic details correspond with what we expected to find in Darfur, giving grounds for believing that the demographic of the sampled population is reasonably representative of the population in the sampled villages as a whole.

Fourteen per cent of adults were physically limited in the work they were able to do, and this was ascribed fairly equally to old age, disability and chronic sickness. Most of those unable to work, or only partially able to work, were living in households with other able-bodied adults, but 3% of sampled households had no fully able-bodied adult.

Table 1: Household sizes in sampled population

Household size	% of households in sample
1–2 people	8%
3–4 people	24%
5–6 people	30%
7–8 people	22%
9–10 people	12%
More than 10 people	4%

Table 2: Breakdown of sampled population by age, compared to national population of Sudan

Age	% of sampled population	% of national population*
0–4	16.0%	14.5%
5–9	18.0%	13.0%
10–14	12.0%	12.0%
15–19	10.0%	11.0%
20–29	14.0%	17.0%
30–39	10.0%	13.0%
40–49	8.0%	9.0%
50–79	11.0%	11.0%
80+	1.1%	0.5%

** Source: www.populationpyramid.net/sudan/2017/*

3.2 Insurance prevalence

The five villages fell into two distinct groups for insurance coverage. In Haraza and Hasabona, insurance coverage was much lower (39% and 23% respectively) than in the other three villages (69% in Nur al Huda and 75% in Faiga). Table 3 gives the prevalence of health insurance in each village over time; significant enrolment began much earlier in Faiga, and to a lesser extent in Nur al Huda.

6 According to reported ages, no one in the sampled households was aged 31–34 or 41–44.

The demographics of households with insurance showed no significant differences from those without insurance with two exceptions: households without children were less likely to be insured than those with children; and households with no fully able-bodied adults were also less likely to be insured. There were no differences in insurance rates for other households with chronically sick, elderly or disabled members.

3.3 Prevalence of ill-health

Three-quarters of the population had been ill in the previous 12 months. Sickness was more common among respondents (81%) than was reported for other adults (68%) or for children (75%), probably at least in part because of bias in the sample of those who were at home during the day. Just over half of those who had been sick during the year had suffered more than one episode of ill-health. Taking the whole population (i.e. including those who had never been sick), the average number of episodes of ill-health was 1.4 and the median was one. Haraza and Harabona had higher rates of sickness (86% had been sick at least once) than the other villages (60%–66%), and a higher average number of episodes of ill-health (1.7 compared to 1.0–1.2 for the other three villages).

The majority of sickness in every village except Faiga was caused by malaria (see Table 4).[7]

Over half the population had last been sick during the rainy season (June–October). Women were slightly more likely to have been sick: among respondents 84% of women and 76% of men had been ill at least once and among non-respondent adults, 76% of women had been ill at least once compared to 60% of men. Women were also more likely to have been sick more often, averaging 1.91 sickness episodes a year compared to men's 1.51 for respondent and 1.38 compared to 1.05 for non-respondent adults. The relative prevalence of different types of sickness was the same, with the exception of complications from pregnancy.

3.4 Healthcare-seeking behaviour

There were no significant differences in healthcare-seeking behaviour between men and women, and figures are therefore aggregated across both sexes. Patterns were also strikingly similar across adults, children over five and children under five. Some form of treatment was sought in 97% of all cases of ill-health – which presumably indicates that the (perceived) need for treatment plays a large role in people defining themselves as sick. It is impossible to analyse healthcare-seeking behaviour by sickness type for two reasons: first, because reported diagnoses may not be accurate and without detailed interviewing we could not establish the pattern of symptoms to which patients and their families were responding; and

Table 3: Percentage of households enrolled in health insurance, by village by year of enrolment

	Haraza	Hasabona	Dorti	Nur al Huda	Faiga
2011	0%	1%	0%	3%	4%
2012	2%	1%	2%	7%	13%
2013	5%	3%	2%	7%	21%
2014	7%	3%	6%	25%	45%
2015	8%	9%	26%	37%	60%
2016	31%	19%	60%	63%	70%
2017	39%	23%	72%	69%	75%

Table 4: Causes of ill-health, by village

Cause of illness	Haraza	Hasabona	Dorti	Nur al Huda	Faiga
Malaria	38%	64%	80%	67%	65%
Infections	33%	20%	9%	16%	21%
Stomach	2%	3%	2%	6%	5%
Gastric problems	14%	3%	7%	11%	6%
Injuries	5%	4%	8%	3%	1%
Hypertension	0%	1%	0%	0%	1%
Complications with maternity	3%	1%	1%	5%	1%
Other	15%	9%	14%	6%	13%

Note: Shaded cells indicate that differences between villages are statistically significant at p= 0.05 (lighter shading) or p=0.01 (darker shading).

7 The breakdown of ill-health by cause cannot be used to analyse the different healthcare-seeking-behaviour for different diseases or the differences in their costs to households, partly because we do not have a proper diagnosis and also because (apart from malaria) the sub-samples of each disease in each village are too small.

second, because the sub-samples of sickness type in each village are too small for analysis.

In almost all cases of sickness (94%) patients accessed Western medicine, either buying drugs from a pharmacy (22%) or attending a health clinic (72%). In 7% of sickness cases traditional medicine was used, most often buying medicine without visiting a healer. Religious healing (from a Shehe) was sought in 4% of cases. Patients in Haraza and Harabona were more likely to attend a clinic (79% and 86% respectively) compared to the other three villages (45%–67%) and less likely to rely on medication from pharmacies. In Dorti and Faiga, the use of a pharmacy was much more common (37%), at least in part because of the better availability of drugs within the village. Many patients preferred to forego a consultation to avoid travelling to Habila.

Health-seeking behaviour was largely the same whether or not the household was registered for health insurance, with no differences in the overall rates of those seeking Western, traditional or religious healing. Insurance only covered Western healthcare at clinics.

In around a quarter of cases, people had to make more than one journey for healthcare. For all kinds of healthcare (Western, traditional and spiritual/religious), people made an average of 1.4 trips per episode of ill-health. A small number of people (<2.5%) had to make five or more visits. Excluding these outliers, the average number of trips out of the village for healthcare was 1.2 per episode of sickness, for both adults and children. Table 5 shows how often a typical household would expect to travel outside the village for Western healthcare each year. The calculation uses the conservative value of just one trip per episode of ill-health: mean values give a slightly higher number of trips.

Table 5: Calculation of typical frequency of visits outside village for Western healthcare, by village

	Faiga	Haraza	Hasabona	Dorti	Nur al Huda
Number of times sick, per person per year	1.1	1.7	1.6	1.2	1
Number of times sought healthcare, per episode of sickness	1.3	1.3	1.2	1.2	1.4
% healthcare outside the village	80%	97%	90%	81%	87%
Number of trips outside village per episode	1	1.3	1.1	1	1.2
Number of episodes for which trips made outside village (per household, per year)	5	10	9	6	5

This means that a household of three adults and three children would expect to make between five and ten trips out of the village for Western healthcare each year.

3.5 Expenditure

3.5.1 Direct expenditure on healthcare

Although payments or gifts were sometimes offered for traditional or spiritual healing, it was used so rarely that the following discussion of expenditure relates only to Western medicine and treatment. (Typical household expenditure on non-Western medicine is summarised in Table 14 below.) Direct expenditure on healthcare is understood as all fees (formal and informal) for consultations and tests, and any charges for buying drugs or related medical supplies (bandages, syringes, etc.). Unofficial charges were rare (in 2% of cases): respondents were able to define for themselves which charges they felt were 'unofficial'.

As one would expect, direct expenditure on healthcare varied enormously from case to case. Many consultations were free, especially for those with insurance and visiting insurance clinics (see Table 6). However, even without insurance and in non-insurance clinics, a third of patients did not have to pay for consultations. On the other hand, in five episodes of sickness (out of 537 investigated), costs for consultation were over 1,500 SDG ($225). In insurance clinics, the cost of consultations did not go beyond 200 SDG ($30). If people had to pay anything, the median cost was between 20 SDG ($3) and 35 SDG ($5), depending on the insurance situation (see Table 6). Drugs typically cost 40–100 SDG ($6–15).

Direct healthcare costs vary enormously from household to household, because of differences in the make-up of the household, the number of times people fall sick, the severity of their sickness and the cost of different treatments. To this variability must be added the differences between insurance and non-insurance clinics, and the fact that different villages had access

to healthcare of different kinds: for example, Haraza and Harabona had less availability of drugs within the village, and patients had to go to Shalaya or Hajar Tama. Most patients in the other villages went to Habila, their locality capital, which was relatively close. However, this variability is not distributed normally around the mean, but is highly skewed to the higher values. The average values (for sickness incidence, costs, household expenditure on health) were therefore much higher than the median value, i.e. the expenditure which most people would expect to face. There are different ways to approach the more conservative calculations of expenditure needed to present a typical picture. Table 7 uses average (mean) values, but removes the highest 5% of values in each village, while Table 8 is based on median values.[8] Neither value is intended to serve as a baseline or for further statistical analysis, but it is believed that they provide the most informative picture to give policy- or decision-makers the best possible understanding of how healthcare expenditure affects households in the study villages. False precision is swapped for a more meaningful range. All calculations are based on the median household composition of three adults and three children.

The two approaches to calculating annual direct healthcare costs show the same pattern across the villages, with the mean values (excluding outliers) giving results consistently 40–80% higher than using medians. A household of six would expect to pay $150–300 on direct expenditure for healthcare in Haraza and Hasabona, $50–$100 in Faiga and Nur al Huda, and $30–60 in Dorti.

Table 6: Cost of consultations and drugs, per visit, in insurance and non-insurance facilities (in SDG)

	Insurance clinics		Non-insurance clinics	
	With insurance	Without insurance	With insurance	Without insurance
n =	57	22	191	259
% of people who paid for consultation	25%	41%	54%	68%
Median cost of consultation* (SDG)	20	25	35	23
Median cost of drugs* (SDG)	40	100	70	100

* *This is the median where costs were paid, i.e. the median of non-zero values.*

Table 7: Calculation of annual household direct expenditure on healthcare, using means excluding highest values

	Faiga	Haraza	Hasabona	Dorti	Nur al Huda
Number of episodes per person per year	1.1	1.7	1.6	1.2	1.0
% treatment drugs only	36%	8%	20%	46%	23%
Cost of drugs (SDG) per episode of ill-health	105	118	157	38	50
% treatment in clinic	45%	79%	86%	58%	67%
Average cost of consultation (includes zero values) (SDG)	31	28	28	10	30
Cost of drugs per episode (SDG)	92	152	167	41	68
Total annual direct expenditure on Western healthcare, per household (SDG)	**617**	**1,562**	**1,910**	**339**	**462**
Total direct expenditure (US$)	**94**	**237**	**289**	**51**	**70**

8 See Annex 1 for further explanation of the calculation.

Table 8: Calculation of annual household direct expenditure on healthcare, using median values

	Faiga	Haraza	Hasabona	Dorti	Nur al Huda
Number of episodes per person per year	1.1	1.7	1.6	1.2	1.0
% treatment drugs only	37%	16%	13%	36%	25%
Cost of drugs (SDG) per episode of ill-health	55	60	70	30	40
% treatment in clinic	45%	79%	86%	58%	67%
Average cost of consultation (includes zero values) (SDG)	53%	55%	69%	44%	53%
Cost of drugs per episode (SDG)	25	40	25	20	20
Total annual direct expenditure on Western healthcare, per household (SDG)	**340**	**1,127**	**1,052**	**240**	**304**
Total direct expenditure (US$)	**52**	**171**	**159**	**36**	**46**

Table 9: 'Typical' costs of transport and food to access healthcare, by village

Village	Cost per trip		Number of trips outside village per year*	Typical expenditure per household per year		Average expenditure per household per year
	SDG	US$		SDG	US$	US$
Faiga	66	10	5.3	348	53	153
Haraza	95	15	9.9	944	143	264
Hasabona	106	16	8.6	915	139	201
Dorti	58	9	5.8	337	51	96
Nur al Huda	85	13	5.2	444	67	111

** See Table 5 above. Calculation assumes only one trip for healthcare per episode of ill-health. $1 = 6.6 SDG.*

3.5.2 Indirect expenditure for accessing healthcare: transport, food and accommodation

Most sick people who left their village for healthcare needed some form of transport. Even in the villages closest to health facilities, only 20% were able to walk. The most common form of transport was by horse/donkey and cart. Only in Dorti did some people (9%) say they had use of an ambulance. In Haraza and Hasabona, 12% of people reported having to use air travel to reach healthcare. In Dorti and Nur al Huda, transport was usually free, whereas the majority (52%–61%) had to pay in the other villages. In most cases (60% of adults and almost all children), patients had to be accompanied so costs had to be paid for two people. If the 5% most expensive journeys are removed as atypical, the average journey cost (for patient and companion) for those who had to pay ranged from 75 SDG in Dorti to 157 SDG in Haraza. Where transport costs had to be paid, median journey costs in different villages ranged from 38 to 150 SDG. In most cases (75%), there were additional food costs, either for the journey or at the destination, and these had to be paid for both the patient and companion. Food typically cost 40–50 SDG, but almost double that if food had to be paid for on the journey as well.

Table 9 shows what households (of three adults and three children) might expect to pay for transport and food in order to access healthcare, using the same kind of calculation with median values as in Table 9. Transport costs ranged from 12 SDG ($1.80) from Dorti to 58 SDG ($8.80) from Hasabona. The costs of food on the journey and food at the health facility was more consistent across the villages, ranging from 37 SDG ($5.60) in Nur al Huda to 48 SDG ($6.30) in Hasabona. The cost of a home-cooked meal, which would have been eaten had no journey for healthcare been necessary, would be around 2 SDG ($0.30) per main meal, and is ignored in these calculations.

In a quarter of cases, patients were not able to return home on the same day after travelling to receive healthcare. Some had to stay away for a long time, but the median stay away from home was four nights. This too had to be paid for in most cases (59%), with no statistically significant difference between those with or without insurance. Typical charges per stay were around 250–500 SDG ($40–75). People from Haraza and Hasabona faced the largest expenditure. They were no less likely to need to stay overnight or to stay longer, but much more likely to have to pay for accommodation (presumably because they do not have the same connections to people in town where they can be accommodated as guests) and because, where they had to pay, charges were much higher.

Table 10 shows the total expenditure on healthcare, combining both the cost of treatment and the costs of accessing that treatment. Unofficial charges are ignored, as they were only reported by very few people, mainly in Haraza. Other charges (e.g. for laboratory tests, cost of telephone calls) are also ignored, because they were reported by a small minority of people. Table 10 shows that direct expenditure typically only constituted from a third to almost a half of households' expenditure on healthcare over the year.

3.6 Full economic burden of ill-health: additional expenditure and lost income

The direct and indirect expenditure on healthcare is only part of the economic cost to households of ill-health. Ill-health brings a further economic burden: time lost from working, either as a patient or when caring for someone else who is sick. This section looks in detail at these costs.

3.6.1 Lost income

Almost everyone needed to be accompanied if they had to seek healthcare outside of their village. Most also needed some care while sick – especially in the case of child sickness. Six per cent of cases needed care lasting over two months and 1% of cases for over six months. Where a carer was needed, the median care burden was six days, and in most cases (88%) the carers usually worked, and so there was an opportunity cost. The median reported time off work for patients was 11 days. In some cases, two members of the same household may fall sick at the same time, but they would presumably need only one carer. To remain conservative in all calculations, it is assumed that in half the cases of sickness, two people are sick at the same time. The overall care burden is therefore reduced by one third. Table 11 below shows the number of days' work lost to sickness in Nur al Huda and Haraza, being respectively the villages with the lowest and highest rates of sickness. The overall mean from the survey data (again, assuming that two people are sick at the same time in half of all sickness episodes) for Nur al Huda and for Haraza is included for comparison, and as expected, it is considerably higher.

The calculation combines data for insured and non-insured households. There is no evidence of any reduced morbidity with insurance or of any change in health-seeking behaviour, and no credible patterns can be found for any differences between days lost for insured or non-insured households.

Table 12 puts this burden into a household economic context. It is assumed that when reporting days lost from sickness or from caring for a patient in the household, respondents did not consider how many of those were actually non-working days, i.e. Fridays and holidays will be included in the figure of 'lost days'. To calculate the percentage of the total working year that has been lost, the same basis must be used, i.e. including Fridays and holidays among the working days. The calculation therefore uses 365 as the denominator. The total household loss is arrived at by multiplying this figure by three adults in a household, multiplied by the percentage of those adults who normally work taken from village-level data.

Table 10: Typical indirect and direct expenditure on healthcare, by village (in US$)

	Faiga	Haraza	Hasabona	Dorti	Nur al Huda
Direct health expenditure	52	171	159	36	46
Food and transport	53	143	139	51	67
Accommodation	5	39	71	13	27
Total	**110**	**353**	**369**	**100**	**141**
Direct expenditure as % of total expenditure	**47%**	**48%**	**43%**	**36%**	**33%**

Table 11: Calculation of typical lost days' work p.a. due to ill-health in Nur al Huda and Haraza villages

		Nur al Huda	Haraza	Calculation
a	% children needing accompaniment to clinic	100%	100%	
b	% adults needing accompaniment to clinic	61%	80%	
c	Number of days lost while accompanying patient	2	2	median, all values
d	% patients needing carer	62%	81%	
e	% carers who normally work	87%	89%	
f	Number of days lost by carers	6	7	median, non-zero values
g	@ 67%	4.0	4.7	f x 2/3
h	Number of days off work by patients (adults only)	7	14	median, non-zero values
i	Days' work lost for one child's sickness	4	5	c + (d x e x g)
j	Days' work lost for one adult's sickness	10	19	h + (b x c) + (d x e x g)
k	Number of episodes per year	1.1	1.7	
l	Typical days lost per household p.a. (three adults + three children)	47	125	= (3 x j x k) + (3 x i x k)
m	Average days lost per household p.a.(three adults + three children)	121	211	as (l), but using mean village data

Note: Because there are no significant differences between the overall mean for children and adults, but highly significant differences between villages, the data is disaggregated by village but not by age.

Table 12: Impact of lost days of work on household economy

	How calculated	Number of days lost	% of adults normally working	% of household earning power lost
Typical number of days lost per household p.a., Nur al Huda	Hybrid calc., see Table 11 row l	47	89%	5%
Average number of days lost per household p.a., Nur al huda	Sample mean, Nur al Huda only	121		12%
Typical number of days lost per household p.a., Haraza	Hybrid calc., see Table 11 row l	125	83%	14%
Average numbers of days lost p.a., Haraza	Sample mean, Haraza village only	211		23%

Depending on the village and the method of calculation, households who do not have serious health problems still lose anywhere from 5% to 23% of their potential earning power as a result of the burden of ill-health.

3.6.2 Full economic burden of ill-health to households

In order to establish a full economic cost of ill-health, it is necessary to combine data on the lost working days and monetary costs. This cannot be done without reliable information on household incomes. Unfortunately, there is no recent published study which offers any estimate of household incomes in any part of Darfur.

In the absence of such data, this paper relies on information from the panel interviews carried out by the Valid Evaluations team in the same villages. These interviews had not attempted to quantify annual household income but do contain enough reliable, if imprecise, information about income levels. Daily or monthly income can be seen in three bands. People with formal employment (e.g. police) or a reasonable local business (e.g. a butcher) were earning 800–1,000 SDG per month (then worth $120–150, at the prevailing rate of $1 = 6.6 SDG). This would only be a small minority of people. Income from charcoal making (hard work and therefore usually relatively well remunerated) or hard agricultural labour was around 20–30 SDG ($3–$4.50) per day. Lighter work,

such as selling in a market (i.e. for a stall with little capital behind it) or women's agricultural labour (often a shorter day) would bring in around 10–15 SDG ($1.50–$2.25)/day. If it is assumed that people depending on daily labour can find work at that same rate for around 18 days a month (over four days a week), and for 11 months in the year, then higher earners (25 SDG($3.80)/day) might earn $750 p.a. and lower earners (13 SDG($2)/day) around $400 p.a. Optimistically assuming that a household has three adults all bringing in some money, one at the higher rate and two at the lower rate, then the potential annual household income (in the absence of time lost from ill-health) would be around $1,550 p.a. This figure, used in the calculations below, is offered as a reliable estimate of a value within the range of a typical household income in West Darfur.

Table 14 presents the overall cost of ill-health in the same way, but using mean values from the village sampled households. This adds a worrying dimension. The average overall burden of ill-health in Nur al Huda was 76% of potential annual household income, and in Haraza it was 175% of potential annual income – meaning that a typical household, whose income was described above, could simply not have accessed the healthcare implied by average costs.

3.7 Paying for health costs

Most people had very little assistance in coping with the expenditure of ill-health or with the difficulty of lost labour. Just 7% reported receiving money as assistance from friends or relatives, but sums were limited. The median sum offered as assistance was 200 SDG ($30). A small number reported other assistance – 8% received food, 1% help with caring for someone sick, and 2% help in cultivating a field. But a majority (80%) reported receiving no help – even though when asked a general question, just over half said it was 'common for other people to help a household

Table 13: Impact of ill-health on household economy (using conservative values)

	Amount in US$		% of potential income	
	Nur al Huda	**Haraza**	**Nur al Huda**	**Haraza**
Typical potential annual household income	1,550	1,550	100%	100%
Direct health expenditure (Western only)	46	171	3%	11%
Indirect health expenditure (Western only)	94	182	6%	12%
% lost income from ill-health	75	213	5%	14%
Expenditure on non-Western healthcare	10	70	1%	5%
Total cost of ill-health	**225**	**636**	**15%**	**41%**
Income, net of health expenditure	**1,325**	**914**	**85%**	**59%**

Table 14: Overall impact of ill-health on household economy (using sample means)

	Amount in US$		% of potential income	
	Nur al Huda	**Haraza**	**Nur al Huda**	**Haraza**
Typical potential annual household income	1,550	1,550	100%	100%
Direct health expenditure (Western only)	365	908	24%	59%
Indirect health expenditure (Western only)	372	1,056	24%	68%
% lost income from ill-health	431	682	28%	44%
Expenditure on non-Western healthcare	10	70	1%	5%
Total cost of ill-health	**1,177**	**2,716**	**76%**	**175%**
Income, net of health expenditure	**373**	**-1,166**	**24%**	**-75%**

to pay healthcare costs'. The difference between the generalised, idealised reply and the specific personal experience should not be surprising, and the evidence for this difference is a warning for those involved in assessments, research or evaluations. Group discussions, in particular, often ask general questions (e.g. 'do people help …?') and yet the answers given cannot necessarily be relied on as evidence of actual practice. Although there are various mechanisms for social solidarity in the village, they do not appear to function in any meaningful way to help most people with costs such as medical expenses.

Left largely to pay for healthcare costs from their own household's means, in only a third of case were households able to pay for healthcare from normal income streams, i.e. from savings (24%) or from income (11%), which sometimes involved undertaking extra work to raise enough money. The rest either had to borrow money (9%) or to sell assets (56%).

Loans were entirely given by friends and relatives, but the amount that people could borrow was limited. The median sum varied across the villages but was always between 250 SDG ($38) and 500 SDG ($46). Sixty-nine per cent of households who sold assets used crops to meet the expenses (i.e. in 39% of episodes of sickness). Twenty-six per cent of those who sold assets (or in 15% of sickness episodes) had to sell livestock, and 1% had to sell land.

3.8 Impact of insurance

It is not possible to use standard statistical analysis alone to understand the impact of insurance on the economic burden to households of ill-health. Ill-health and costs are dependent on which village people live in, and the number of sickness episodes for the sub-samples of insured or non-insured households in each village were small in some villages. More confusingly, some statistically significant differences do not have any obviously rational explanation (5% of statistically significant differences at p=0.05 are meaningless). For example, expenditure on food while travelling to access healthcare was reported as eight times higher for non-insured households than for insured households in one village. Such differences cannot plausibly be linked to a lack of insurance. A simple overall comparison of total costs incurred by insured and non-insured households would risk being influenced by data for which there is no logical model. It is plausible to imagine that households with insurance seek healthcare more effectively and, as a result, enjoy better health: however, there was no evidence for such an assumption.

It is also plausible to assume that households with insurance would be more likely to use Western healthcare, and possibly more likely to be cured more quickly, but the data showed no evidence for differences in healthcare or in time lost from work. Insured and non-insured patients usually went to the same clinics, with the difference being how much patients were charged for consultation and for drugs. It is reasonable to conclude that the only discernible impact of health insurance on the household economy was the reduction in direct health costs (i.e. for medical consultations, tests and drugs).[9]

Data reveal that there are no clear patterns regarding the costs of consultations for insured and non-insured households. Insured households were more likely to receive free consultations in insurance clinics (75%) than the non-insured – though the majority of the non-insured (59%) still received free consultations. However, the insured were also more likely to receive free consultations in non-insurance clinics (46% compared to 31%). Furthermore, when they had to pay, the insured paid slightly more for consultations at insurance clinics than non-insured people (an average of 40 SDG ($6), compared to 30 SDG ($4.50)). This finding is surprising and hard to explain, but has also been found a previous study of NHI in Sudan[10] (Witter, 2011, who described the finding as 'unexpected and worrying'). The overall expectation of payment (i.e. the probability of having to pay multiplied by the average amount paid) is almost the same for the insured and non-insured, whether they went to insurance or non-insurance clinics. The insured can expect to save just 3 SDG ($0.45) per visit in an insurance clinic and 9 SDG ($1.35) in a non-insurance clinic. There are clearer savings from insurance on the costs of drugs, even if these are also modest. Insured patients are supposed to access drugs for 25% of the retail cost. Our data shows insured households paid around one third of the amount that non-insured people paid in insurance pharmacies/clinics (using either the mean or median for comparison), though these varied across the villages.

The average costs of drugs were the same for insured and non-insured patients in Hasabona, but there were savings for the insured in all other villages, ranging from 33% in Nur al Huda to 65% in Faiga. There were no significant differences in prices paid by

9 On average, transport costs were more than twice as high for non-insured households, but this was due to lower insurance coverage in villages from where transport costs were higher.

10 Witter (2011) did not include data from Darfur. The study covered Khartoum, Red Sea, Kassala, Blue Nile and South Kordofan.

Table 15: Costs of Western medicine (in SDG) for one treatment, where charges were made

	Insurance clinics		Non-insurance clinics	
	Households with insurance	Households without insurance	Households with insurance	Households without insurance
Mean	50	181	160	271
Median	35	100	75	100

insured and non-insured people for (Western) drugs without a consultation, as these were usually bought within the village. The cost of self-prescribed drugs ranged from 38/30 SDG (mean/median) in Doti to 157/70 SDG in Hasabona.

It is perhaps more relevant to look for insurance to protect households from catastrophic costs. Here too the evidence appears clear at first sight: the highest charge paid for drugs for one sickness episode in an insurance clinic by the insured was 200 SDG ($30), whereas costs reached over 3,000 SDG ($450) otherwise. However, the picture becomes less clear on closer analysis: 19% of insured people were still paying more than 200 SDG ($30) for drugs for one sickness episode, because most insured people went to non-insurance clinics. This is slightly less than the 23% of non-insured people who paid over 200 SDG ($30) for drugs, but the protection offered by insurance from high charges is clearly less than expected.

Table 16 shows the possible benefits that a household might receive from insurance in Hasabona village, chosen because the population there visit clinics more often than from any other village in the sample, and so potential savings from insurance should be higher than in the other sampled villages.[11] The savings from insurance are based on a family not currently paying for NHI insurance cover. Patterns in the data are not clear enough for any precise calculations to be meaningful, and instead median figures from the whole sample are used to make less precise, but more reliable, estimates. On this basis, savings from each visit could be 65 SDG ($9.85), of which 60 SDG ($9.09) is the saving on drugs and 5 SDG ($0.76) the saving on the consultation (see Table 15). Households from Hasabona typically make eight trips to clinics a year –

Table 16: Possible savings from health insurance in Hasabona village

Clinic visits per year	8
Saving per visit to clinic (SDG)	65
% healthcare at insurance clinics (by insured households)	24%
Total saving (SDG)	**125**
Total saving (US$)	**19**

but across the sample, households with insurance only use insurance clinics for a quarter of their clinic visits. The overall saving is thus probably under $20/year.

Insurance is a system designed for sharing costs (or losses) amongst all those registered for insurance. If it is self-financing, then it does not reduce the overall cost burden to those registered but will instead increase it due to the running costs of the scheme itself. Health insurance can provide protection for households against the catastrophic health costs of serious illness for which treatment is particularly expensive. However, the aim of this study was to quantify typical costs, for which insurance does not offer a protection mechanism – because when everyone has similar costs, there is no benefit from the registered households sharing those costs among themselves. Because the figures used in this paper are conservative and based largely on median figures, they are considerably lower than average costs, which would be the basis for a self-financing insurance system. Most people in this sample would therefore incur considerably higher costs for self-financed insurance than the typical expenditure levels reported here. In summary, this portrayal of a typical economic burden of ill-health is precisely the burden for which sharing, through insurance, cannot help.

11 86% of all identified case of ill-health resulted in a visit to a health clinic in Hasabona. The average across the sample was 72%.

4 Conclusions

1. The economic burden of ill-health is high. Even where households experience no unusually serious health problem, sickness costs them around $250–600 per year, depending on where they live; equivalent to between 15% and 40% of their potential annual household income.
2. Insufficient attention has been given to this overall economic burden, for which no calculations are available for Sudan or for many other countries.
3. The cost of ill-health is three times higher in some villages than in others. This surely offers potential insights for decision-makers: the economic cost of ill-health can potentially be reduced in the villages with the highest burden by addressing the factors that differentiate them, e.g. high rates of malaria and higher costs of accessing healthcare.
4. The estimates of typical direct costs of healthcare were lower than the estimates for either the indirect costs of healthcare or the cost of lost labour. Although the figures are not precise enough to draw firm conclusions about the relative sizes of these costs, it is reasonable to conclude that, for most people, direct healthcare costs constitute a minority of the total economic cost of ill-health. This has several implications. Any measures to offer free healthcare will reduce, but not remove, the economic burden of ill-health. Making healthcare more accessible at village level, and thus removing the indirect costs of accessing care and reducing the labour lost in seeking it, would have a far greater economic benefit if this can be done without reducing the quality of healthcare. Preventing or reducing ill-health would potentially have a much more significant impact, since it would reduce all three components of the total economic cost.
5. The current costs benefits of free health insurance for most people is very small, not more than around 5% of the total cost of ill-health. Health insurance may have much greater benefits in sharing the costs of catastrophic charges, but these were not studied.
6. This paper has dealt with the methodological challenges of painting an informative picture of the economic burden of healthcare. The authors offer two conclusions in this regard:
    i. The difficulties of quantifying this burden in a way that reflects the lives of most people mean that great care is needed in the use of any figures. Even where credible and reliable, they are inevitably imprecise. This has implications for hypothesis testing for policy development, and for monitoring/evaluation.
    ii. It is possible to create credible estimates of the economic burden of ill-health. These estimates are essential for decision-makers in the fields both of health and of food security/livelihoods. There is currently far too little information of this type available.

The implications of these conclusions will be analysed further in Valid Evaluations' final report for the multi-country thematic evaluation of MYHF.

References

Guha-Sapir, D. and D'Aoust, O. (2010) *Demographic and health consequences of civil conflict*. World Development Report 2011 Background Paper. Washington: World Bank

Witter, S. (2011) *Summary report: review of free care policy (pregnant women and under-fives) in Northern Sudan*. Khartoum: Federal Ministry of Health

Annex 1 Methodological note

Ideally, information would be collected from every household member relating to every episode of ill-health. However, this was not possible for two reasons. Most importantly, the resulting interview would have been too long to be useful. Establishing all the costs of ill-health requires long and systematic questioning to establish all the health-seeking behaviour associated with each bout of sickness: all the costs for each visit to every kind of healthcare; establishing the number of people travelling and eating in each case; and the number of lost days' work for patients and carers. This long list of questions needs to be repeated for every visit to every kind of health centre for every sickness episode for every member of the household. Field tests of the questionnaire showed that asking in detail about all costs related to every sickness episode of each member of the household resulted in an interview that was so long that there was a high likelihood that respondents would give incorrect information as they grew tired and bored. In addition to this, even if they had been willing to answer all questions accurately, respondents were often unsure of the exact expenditure incurred by other household members.

Following field testing, the survey instrument was shortened to ask about the number of sickness episodes and the number of healthcare visits for every member of the household but establishing detailed costs only for one sickness episode for the respondent and for one child. No assumption is made that sickness rates are the same for respondents and for other household members (see below), but an assumption is made that the costs associated with any visit to a healthcare facility are similar. Costs were originally disaggregated for men and for women, and for children by sex and separately for those below and above the age of five. Types of sickness were also established, to verify that cost comparisons were being made for similar sickness patterns.

There were statistically significant differences between respondents' reports of their own ill-health and that of other members of their households. This is may be due to survey fatigue, with respondents tempted to under-report sickness episodes for subsequent household members to reduce the number of questions. It is also possible that people interviewed at home during the day were more likely to be sick than those absent from the house. This possible bias is removed from the analysis by using data on prevalence of ill-health and on health-seeking behaviour only for other adults in the house. (Although removing the respondents from this calculation may over-correct the sample, this paper prefers at all times to estimate costs as conservatively as possible.) Data for the cost of each visit is taken from respondents' own healthcare.

Median values portray a more realistic picture of household expenditure in cases where distributions are highly skewed from the normal. However, household median expenditure cannot be established because this would have necessitated asking about all the costs for all the episodes of ill-health in the household, which was impossible, as explained above. This study therefore must reconstruct a value to serve as an annual household median in two stages.

It was not possible simply to use the median values for all the cost parameters to calculate an overall median. For some parameters, there was no cost in over half the episodes of ill-health, making the median value zero. However, this median value could not be multiplied by the number of episodes of ill-health, because it may be unlikely for a household to have a zero cost for every trip during the year. Instead, the study uses the median value for those values above zero and multiplies this by the percentage of cases where costs were incurred. For example, if transport was free in 60% of cases but the median cost for those who paid was $1, the actual median cost for one visit was $0. However, over six trips, the median cost would not be six trips x $0/trip = $0. We use a value of $1 x 40% of cases with payment = $0.40 per trip, to arrive at a typical annual cost of six trips x $0.40 per trip = $2.40 per year.

HPG

Humanitarian
Policy Group

The Humanitarian Policy Group is one of the world's leading teams of independent researchers and communications professionals working on humanitarian issues. It is dedicated to improving humanitarian policy and practice through a combination of high-quality analysis, dialogue and debate.

Humanitarian Policy Group
Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ
United Kingdom

Tel.: +44 (0) 20 7922 0300
Fax.: +44 (0) 20 7922 0399
Email: hpgadmin@odi.org
Website: odi.org/hpg

Cover photo: A farmer from Adar, West Darfur sits beside his son, who is in hospital after being infected with Yellow Fever.
© Albert González Farran/ UNAMID

ODI