

Variations in catastrophic health expenditure estimates from household surveys in India

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Objective To assess the comparability of out-of-pocket (OOP) payment and catastrophic health expenditure (CHE) estimates from different household surveys in India.

Methods Data on CHE, outpatient and inpatient OOP payments and other expenditure from all major national or multi-state surveys since 2000 were compared. These included two consumer expenditure surveys (the National Sample Survey for 2004–05 [NSS 2004–05] and 2009–10 [NSS 2009–10]) and three health-focused surveys (the World Health Survey 2003 [WHS 2003]; the National Sample Survey on Morbidity, Health Care and the Condition of the Aged 2004 [NSS 2004]; and the Study on Global Ageing and Adult Health 2007–08 [SAGE 2007–08]). All but the NSS 2004–05 and the NSS 2009–10 used different questionnaires.

Findings CHE estimates from WHS 2003 and SAGE 2007–08 were twice as high as those from NSS 2004–05, NSS 2009–10 and NSS 2004. Inpatient OOP payment estimates were twice as high in WHS 2003 and SAGE 2007–08 because in these surveys a much higher proportion of households reported such payments. However, estimates of expenditures on other items were half as high in WHS 2003 as in the other surveys because a very small number of items was used to capture these expenditures.

Conclusion The wide variations observed in CHE and OOP payment estimates resulted from methodological differences. Survey methods used to assess CHE in India need to be standardized and validated to accurately track CHE and assess the impact of recent policies to reduce it.

Abstracts in **عربي**, **中文**, **Français**, **Русский** and **Español** at the end of each article.

Introduction

Out-of-pocket (OOP) payments are the primary source of health-care financing in many countries.¹ In 2004–05, OOP payments in India were estimated to account for approximately two thirds of total health expenditure² and fewer than 10% of households had health insurance for at least one member.³ OOP payments are considered “catastrophic” when they drive households into having to reduce expenditure on basic necessities.⁴ The proportion of households that incur catastrophic health expenditure (CHE) in a country is widely used as an indicator of the extent to which the health system protects households needing health care against financial hardship. Offering such protection is a major goal of health systems and is the purpose behind universal health coverage.^{4–10}

In many countries, household surveys – some focused on consumer expenditure and others on health – are the main sources of data on households’ OOP payments for health care.¹ The estimates of OOP payments vary substantially between surveys depending on survey type, type of respondents and the survey methods used, such as the length of the recall period or the number of items included in the survey questionnaire.^{1,11–17} In India, data on household expenditure are routinely available from National Sample Survey Organisation surveys on consumer expenditure and from special survey rounds on health.^{18,19} All of these surveys exert an important influence on health policy because they are the sources of data for programme and policy assessment^{9,10,20,21} and for the preparation of the national health accounts.^{2,22} Other health-focused household surveys have also recently collected information on household expenditure.^{23,24} Although these surveys have all been used to estimate CHE and OOP payments in India, no one has ever assessed whether the estimates obtained from them are comparable.

For this paper, we generated household OOP payments and CHE estimates using data from five national and multi-state household surveys conducted in India since the year 2000 and we compared the results. We also examined and compared the number and type of household expenditure items included in each survey questionnaire to try to explain the variability in OOP payment and CHE estimates across surveys. This exercise may prove useful in standardizing survey methods to obtain CHE estimates that are valid and consistent.

Methods

Data sources

Table 1 shows the characteristics of the five surveys that have collected data on health expenditure and other expenditure in India since the year 2000. The surveys are of two types: consumer expenditure surveys and health-focused surveys.

Consumer expenditure surveys

We obtained data from the National Sample Survey on Household Consumer Expenditure, which was conducted in all Indian states in 2004–05 (NSS 2004–05)²⁵ and 2009–10¹⁸ (NSS 2009–10). These surveys collected data on expenditure for any health service, whether or not the household paid for the service. The expenditure data thus collected is considered an approximation of OOP payments, since most private payments for health care in India are made out of pocket. NSS 2009–10 was conducted in two parts – Type I and Type II – with a different questionnaire for each one. The Type I survey used the same questionnaire as NSS 2004–05 and hence was used for all analyses; in the Type II survey, the recall period for food expenditure differed from the one that was used in the Type I survey.

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Table 1. Characteristics of household surveys used to collect data on household expenditure on health, India

Survey characteristic	Consumer expenditure surveys			Health-focused surveys	
	NSS 2004–05	NSS 2009–10	WHS 2003	NSS 2004	SAGE 2007–08
Coverage	All India	All India	6 states ^a	All India	6 states ^a
No. of households	124 644	100 855	10 279	73 868	9626
Respondent for data on OOP payment for health care	Household informant	Household informant	Household informant	Person treated or mother of child treated	Household informant
Respondent for food and other expenditure data	Household informant	Household informant	Household informant	Household informant	Household informant

NSS 2004, National Sample Survey on Morbidity, Health Care and the Condition of the Aged 2004; NSS 2004–05, National Sample Survey on Household Consumer Expenditure 2004–05; NSS 2009–10, National Sample Survey on Household Consumer Expenditure 2009–10; OOP, out-of-pocket; SAGE 2007–08, Study on Global Ageing and Adult Health 2007–08; WHS 2003, World Health Survey 2003.

^a States of Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh and West Bengal.

Health-focused surveys

We analysed data on OOP payments from the World Health Survey conducted in 2003 (WHS 2003);²³ the National Sample Survey on Morbidity, Health Care and the Condition of the Aged conducted in 2004 (NSS 2004),¹⁹ and the Study on Global Ageing and Adult Health conducted in 2007–08 (SAGE 2007–08).²⁴ The WHS 2003 and SAGE 2007–08 were conducted in six states that were selected to be representative of India geographically and in level of development;²³ the NSS 2004 was conducted in all Indian states. In WHS

2003 and SAGE 2007–08, data on OOP payments were collected from a household informant; in the NSS 2004, such data were collected from the individual treated for each episode of illness.

Expenditure variables

Table 2 shows the number of survey items or questions used to collect household expenditure data in each survey; Table 3 presents the health items recorded. NSS 2004 was the only survey that used a single question to investigate total household expenditure. As a result, it did not collect data on food expenditure separately. Since NSS 2004–05 and NSS

2009–10 were consumer expenditure surveys, they collected expenditure data on a wider variety of household items than WHS 2003 and SAGE 2007–08. The items included in the outpatient and inpatient expenditure categories varied across surveys (Table 3).

Data analysis

We measured CHE using two definitions commonly used in the literature.^{4,7,9,26–29} Under the first definition, OOP payments were estimated as a proportion of household capacity to pay; under the second, they were estimated as a proportion of total household expen-

Table 2. Recall periods and number of items used in household surveys to capture household expenditure on health care, food and other items, India

Survey	OOP payments for outpatient care		OOP payments for inpatient care		Food expenditure		Other expenditure ^a	
	No. of items	Recall period	No. of items	Recall period	No. of items	Recall period	No. of items	Recall period
NSS 2004–05	6	1 month	5	1 year	142	1 month	102	1 month
	2	1 year	–	–	–	–	84	1 year
NSS 2009–10, Type I	6	1 month	5	1 year	142	1 month	103	1 month
	2	1 year	–	–	–	–	86	1 year
NSS 2009–10, Type II	6	1 month	5	1 year	95	7 days	17	7 days
	2	1 year	–	–	47	1 month	86	1 month
WHS 2003	7	1 month	1	1 and 11 months ^b	1	1 month	4	1 month
	–	–	–	–	–	–	–	–
NSS 2004	12	15 days	14	1 year	0 ^c	–	0 ^c	–
	4	1 year	–	–	–	–	–	–
SAGE 2007–08	7	1 month	2	1 year	9	7 days	5	1 month
	1	1 year	–	–	–	–	8	1 year

NSS 2004, National Sample Survey on Morbidity, Health Care and the Condition of the Aged 2004; NSS 2004–05, National Sample Survey on Household Consumer Expenditure 2004–05; NSS 2009–10, National Sample Survey on Household Consumer Expenditure 2009–10; OOP, out-of-pocket; SAGE 2007–08, Study on Global Ageing and Adult Health 2007–08; WHS 2003, World Health Survey 2003.

^a This category includes all household expenditure other than out-of-pocket health-care payments and food expenditure; in WHS 2003 and SAGE 2007–08 it includes specific items under prepaid health expenditure, such as health insurance, and in NSS 2004–05, NSS 2009–10 and SAGE 2007–08 it includes durable items.

^b Expenditure was reported for most recent month and most recent year (not including the most recent month).

^c Only total household expenditure in the most recent month was documented.

diture. Household capacity to pay was calculated as the total household expenditure less subsistence expenditure, in accordance with the method described by Xu et al.⁴ Subsistence expenditure – defined as the mean food expenditure of households falling between the 45th and 55th percentiles of the total sample in terms of the share of total household expenditure spent on food – was estimated for each survey separately.⁴ We classified a household as having incurred CHE if it had spent out of pocket on health 40% or more of its capacity to pay or 10% or more of its total household expenditure.^{7,9,26,28,30} We applied both definitions to estimate CHE from all the surveys except NSS 2004, where we used only the second definition because the survey did not collect food expenditure.

Since WHS 2003 and SAGE 2007–08 sampled only six states in India and the other surveys sampled all states, we examined the possibility that any differences in CHE estimates were due to this difference in sample coverage. We did this by comparing the CHE estimates from NSS 2004–05, NSS 2009–10 and NSS 2004 for all states with CHE estimates from these same surveys for the six states sampled in WHS 2003 and SAGE 2007–08. Our premise was that if the estimates for all states turned out to be similar to those for the six states, this would indicate that CHE estimates were not affected by the difference in sample coverage.

Because the differences between surveys in CHE estimates could be due to differences in OOP payment and total household expenditure estimates, these estimates were compared. The OOP payments reported in the surveys were divided into outpatient and inpatient expenditure. Expenditure on food and “other” expenditure were also investigated. “Other” expenditure comprised all household expenditure other than out-of-pocket health-care payments and food expenditure; it included specific items under prepaid health expenditure, such as health insurance, in WHS 2003 and SAGE 2007–08, and durable items in NSS 2004–05, NSS 2009–10 and SAGE 2007–08.

The mean, median and first and third quartiles of outpatient and inpatient OOP payments, food expenditure, other expenditure and total household expenditure, documented in Indian rupees (INR), were converted to 2009–10 prices using gross domestic product

Table 3. **Items used in household surveys to assess out-of-pocket payments for outpatient and inpatient care, India**

Survey	Type of care	Recall period	Recorded items paid OOP	
NSS 2004–05	Outpatient	1 month	Doctor's/surgeon's fee Medicine X-ray, EKG, pathology test, etc. Family planning appliances ^a Other medical expenses Spectacles	
		1 year	Hearing aids and orthopaedic equipment Other medical equipment	
	Inpatient	1 year	Doctor's/surgeon's fee Medicine X-ray, EKG, pathology test, etc. Hospital and nursing home charges Other medical expenses	
NSS 2009–10	Outpatient	1 month	Doctor's/surgeon's fee Medicine X-ray, EKG, pathology test, etc. Family planning appliances ^a Other medical expenses Spectacles	
		1 year	Contact lenses, hearing aids & orthopaedic equipment Other medical equipment	
	Inpatient	1 year	Doctor's/surgeon's fee Medicine X-ray, EKG, pathology test, etc. Hospital and nursing home charges Other medical expenses	
WHS 2003	Outpatient	1 month	Care by doctors, nurses, midwives Medication Diagnostic tests Care by traditional or alternative healers Dentists Health care products such as glasses, hearing aids	
		1 month	Overnight stay in hospital	
	Inpatient	1 year	Overnight stay in hospital (except in last 4 weeks)	
NSS 2004	Outpatient	15 days	Doctor's/surgeon's fee – hospital staff Doctor's/surgeon's fee – other specialists Medicines – from hospital Medicines – from outside Diagnostic tests Attendant charges Physiotherapy Personal medical appliances Food and other materials Blood, oxygen cylinder Services (e.g. ambulance) Expenditure not elsewhere reported	
		1 year	Vaccination of children aged 0–4 years Prenatal care Childbirth (not in hospital) Postnatal care	
		Inpatient	1 year	Doctor's/surgeon's fee – hospital staff Doctor's/surgeon's fee – other specialists Medicines – from hospital Medicines – from outside Diagnostic tests Bed charges Attendant charges Physiotherapy Personal medical appliances Food and other materials Blood, oxygen cylinder Services (e.g. ambulance) Expenditure not elsewhere reported Child birth

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Survey	Type of care	Recall period	Recorded items paid OOP
SAGE 2007–08	Outpatient	1 month	<i>Registrations and consultation fees</i>
			<i>Medications</i>
			<i>Diagnostic test</i>
	Inpatient	1 year	Health care by traditional or alternative healers
			Dentists/dental care
			Ambulance
Inpatient	1 year	Other	
		<i>Health-related items (glasses, hearing aids, canes, etc.)</i>	
			Overnight stay in hospital or health facility
			Long-term care facility (such as house for old, house of rest)

EKG, electrocardiogram; NSS 2004, National Sample Survey on Morbidity, Health Care and the Condition of the Aged 2004; NSS 2004–05, National Sample Survey on Household Consumer Expenditure 2004–05; NSS 2009–10, National Sample Survey on Household Consumer Expenditure 2009–10; OOP, out of pocket; SAGE 2007–08, Study on Global Ageing and Adult Health 2007–08; WHS 2003, World Health Survey 2003.

^a Family planning appliances includes intrauterine devices, oral pills, condoms, diaphragms, spermicides, etc. Note: Items common to all surveys are in italics.

deflators and then to United States dollars (US\$; exchange rate: US\$ 1 = 46.7 INR).^{31,32} The interquartile range was defined as the interval between the third and first quartiles. Since outpatient and inpatient OOP payments can be affected by the proportion of households reporting this expenditure, we also compared the proportions of households that reported such payments in the different surveys and the mean and median outpatient and inpatient OOP payments of the reporting households. Since different recall periods were used in the surveys for different items of expenditure, we prorated the reported expenditures to correspond to the same recall period to facilitate direct comparisons between surveys. Thus, for inpatient OOP payments we used a recall period of one year for all surveys. Outpatient OOP was reported for the most recent month in all surveys except NSS 2004, which used a 15-day recall period. For food expenditures, “other” expenditures and total expenditures we used a one-year recall period to allow comparison between surveys. Because the two parts of NSS 2009–10 used a different recall period for food expenditure, we assessed estimates of food expenditure from both parts.

We conducted all analyses at the household level and applied survey sampling weights. To calculate the 95% confidence intervals (CIs) of the proportions, we took into account survey design features such as stratification and clustering in estimating the variance with Taylor linearization.³³ Data were analysed using SAS version 9.2 (SAS Inc., Cary, United States of America).

Results

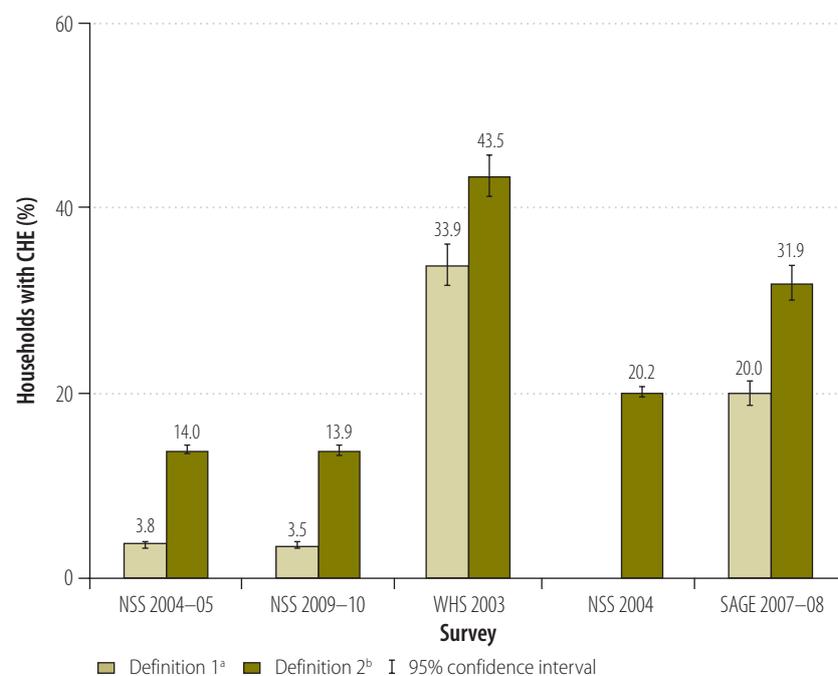
Catastrophic health expenditure

Fig. 1 shows the estimated proportion of households that had CHE according to each of the two definitions of CHE used. The estimates of CHE for NSS 2004–05 and NSS 2009–10 were the same and, since these surveys used the same questionnaire to document expenditure, there

was no change in CHE from 2004–05 to 2009–10. When defined as the proportion of a household's capacity to pay, CHE was most frequently found in WHS 2003 (33.9% of households; 95% CI: 31.6–36.2) and SAGE 2007–08 (20.0%; 95% CI: 18.8–21.3). These figures were markedly higher than for NSS 2004–05 (3.8%; 95% CI: 3.6–3.9) and NSS 2009–10 (3.5%; 95% CI: 3.3–3.7). When defined as the proportion of a household's total expenditure, CHE was, again, most frequently found in WHS 2003 (43.5% of households; 95% CI: 41.3–45.8) and SAGE 2007–08 (31.9%; 95% CI: 30.2–33.7). In NSS 2004, 20.2% of households (95% CI: 19.7–20.6) were found to have incurred CHE. This was a higher rate than the rates found in NSS 2004–05 (14.0%; 95% CI: 13.4–14.3) and NSS 2009–10 (13.9%; 95% CI: 13.4–14.3).

When we assessed the relative contribution of inpatient and outpatient OOP payments to CHE, we found outpatient OOP payments to be responsible for a large proportion of the households with CHE: 73.1% in NSS 2009–10 to 84.6% in SAGE 2007–08 when CHE was defined as the proportion of a house-

Fig. 1. Percentage of households with catastrophic health expenditure (CHE), defined two different ways, as estimated from data obtained from five major household surveys conducted in India since 2000



NSS 2004, National Sample Survey on Morbidity, Health Care and the Condition of the Aged 2004; NSS 2004–05, National Sample Survey on Household Consumer Expenditure 2004–05; NSS 2009–10, National Sample Survey on Household Consumer Expenditure 2009–10; SAGE 2007–08, Study on Global Ageing and Adult Health 2007–08; WHS 2003, World Health Survey 2003.

^a Out-of-pocket payments equalling or exceeding 40% of a household's capacity to pay.

^b Out-of-pocket payments equalling or exceeding 10% of a household's total expenditure.

hold's capacity to pay; 73.2% in NSS 2004 to 78.6% in NSS 2004–05 when CHE was defined as the proportion of a household's total expenditure.

Table 4 shows the proportion of households that incurred CHE in NSS 2004–05, NSS 2009–10 and NSS 2004 in all states of India and in only the six states that were sampled in WHS 2003 and SAGE 2007–08. CHE estimates were slightly higher for the six states than for all states in NSS 2004–05 and NSS 2004, but not in NSS 2009–10. However, these small differences do not explain why the estimates from WHS 2003 and SAGE 2007–08 were much higher than those from the other surveys.

Outpatient care

Table 5 shows the mean and median OOP payments for outpatient care reported by all households over the most recent month. Such payments were approximately 2.6 to 3.8 times higher in WHS 2003 and SAGE 2007–08 than in NSS 2004–05 and NSS 2009–10. The interquartile ranges for WHS 2003 and SAGE 2007–08 were 2.5 to 3.8 times higher than for NSS 2004–05 and NSS 2009–10. In NSS 2004, the mean OOP payment for outpatient care in the most recent 15 days was US\$ 3.1 and the median was zero.

The proportion of households that reported OOP payments for outpatient care in the most recent month varied by only 13 percentage points between the surveys; the highest proportion was found in SAGE 2007–08 (75.2%) and the lowest in NSS 2004–05 (62%) (Table 6). When OOP payments for out-

patient care were considered only for the households that reported them, WHS 2003 and SAGE 2007–08 again showed substantially higher estimates (2.3 to 2.8 times higher) than NSS 2004–05 and NSS 2009–10. This suggests that the use of different items to assess how much households spent out of pocket on outpatient care had a significant impact on estimates. In NSS 2004, with a recall period of 15 days, 32.9% (95% CI: 32.3–33.4) of the households reported OOP payments for outpatient care, and the mean and median amounts paid out of pocket for such care by these households were US\$ 9.4 and US\$ 4.2, respectively.

Inpatient care

The OOP payments for inpatient care in the most recent year were 1.6 to 2.8 times higher in WHS 2003 and SAGE 2007–08, respectively, than in NSS 2004–05 and NSS 2009–10 (Table 5). The OOP payment for inpatient care in NSS 2004 was 0.5 and 1.1 times as high as the payment in NSS 2004–05 and NSS 2009–10, respectively.

The proportion of households that reported paying out of pocket for inpatient care varied substantially between surveys. This proportion was much higher in WHS 2003 (25.9%) and SAGE 2007–08 (25%) than in NSS 2004–05 (9.2%), NSS 2004 (12.8%) and NSS 2009–10 (13.2%) (Table 6). Interestingly, when expenditure for inpatient care was examined for the households that reported it, the lowest median (US\$ 68.4, NSS 2009–10) was only 26% lower than the highest median (US\$ 92.8, WHS 2003) (Table 6). In contrast, the high-

est median expenditure for all sampled households was three times larger than the smallest median (Table 5), which suggests that the methods used in each survey had a greater effect on the frequency with which households reported having paid out of pocket for inpatient care than on the amount reported.

Food expenditure

Food expenditure in the most recent year is shown in Table 5. The surveys that used a one-month recall period (NSS 2004–05, NSS 2009–10 Type I and WHS 2003) had median food expenditure estimates that were from 14% to 36% lower than the surveys that used a one-week recall period, alone or in combination with a one-month recall period (NSS 2009–10 Type II and SAGE 2007–08). NSS 2009–10 Type II and SAGE 2007–08, both of which had a one-week recall period for some or all items, had similar median expenditure, even though SAGE 2007–08 used only 9 items to capture food expenditure and NSS 2009–10 Type II used 142. However, WHS 2003, which only used one item, had a higher median food expenditure estimate than the other surveys with the same recall period, namely NSS 2004–05 and NSS 2009–10 Type I. The interquartile range for food expenditure in WHS 2003 (US\$ 604.6) and SAGE 2007–08 (US\$ 576.6) was higher than in NSS 2004–05 (US\$ 378.6), NSS 2009–10 Type I (US\$ 408.2) and Type II (US\$ 486.0).

"Other" and total household expenditure

"Other" expenditure was lowest in WHS 2003; it was about 1.5 to 2 times higher in SAGE 2007–08, NSS 2004–05 and NSS 2009–10 (Table 5). WHS 2003 used the least number of items to assess "other" expenditure; it also used a one-month recall period for all items and it used no items to specifically document expenditure on durables. Thus, "other" expenditure is higher in surveys with a higher number of items and a variety of recall periods. The low "other" expenditure estimate in WHS 2003 would have contributed to the fact that CHE estimates for WHS 2003 were higher than for the other surveys. The total household expenditure in the most recent year was lowest for NSS 2004 (median: US\$ 829.6), a survey that did not collect disaggregated household expenditure data like the other surveys (Table 5).

Table 4. Comparison of proportion of households that incurred catastrophic health expenditure (CHE) using two definitions of CHE, for six states^a and all states, India

Survey	Proportion of households that reported CHE, % (95% CI)			
	Definition 1 ^b		Definition 2 ^c	
	Six states ^a	All states	Six states ^a	All states
NSS 2004–05	4.4 (4.1–4.7)	3.8 (3.6–3.9)	15.3 (14.8–15.9)	14.0 (13.6–14.3)
NSS 2009–10	4.1 (3.7–4.6)	3.5 (3.3–3.7)	14.7 (14.0–15.4)	13.9 (13.4–14.3)
NSS 2004	–	–	21.6 (20.9–22.4)	20.2 (19.7–20.6)

CI, confidence interval; NSS 2004, National Sample Survey on Morbidity, Health Care and the Condition of the Aged 2004; NSS 2004–05, National Sample Survey on Household Consumer Expenditure 2004–05; NSS 2009–10, National Sample Survey on Household Consumer Expenditure 2009–10.

^a States of Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh and West Bengal, which were the only states sampled in the World Health Survey 2003 and in the Study on Global Ageing and Adult Health 2007–08.

^b Out-of-pocket payments equalling or exceeding 40% of a household's capacity to pay.

^c Out-of-pocket payments equalling or exceeding 10% of a household's total expenditure.

Table 5. Mean and median household out-of-pocket (OOP) health-care payments, food expenditure, "other" expenditure and total expenditure, in most recent year, across all sampled households, India

Survey	OOP payments (US\$) for outpatient care in most recent month		OOP payments (US\$) for inpatient care in most recent year		Food expenditure (US\$)		"Other" expenditure ^a (US\$)		Total expenditure (US\$)	
	Mean	Median (IQR)	Mean	Median ^b (IQR)	Mean	Median (IQR)	Mean	Median (IQR)	Mean	Median (IQR)
NSS 2004-05	4.3	1.2 (0-4.4)	18.7	0 (0-0)	573.4	500.5 (340.6-719.2)	636.9	372.8 (232.3-679.4)	1279.7	948.0 (624.5-1506.8)
NSS 2009-10, Type I	4.6	1.5 (0-4.9)	26.2	0 (0-0)	651.0	578.0 (400.8-809.0)	661.4	428.0 (268.8-736.7)	1393.2	1080.1 (732.6-1653.9)
NSS 2009-10, Type II	-	-	-	-	782.9	689.4 (479.7-965.8)	-	-	-	-
WHS 2003	16.1	3.4 (0-16.8)	69.4	0 (0-0.2)	824.8	604.7 (403.1-1007.7)	405.5	181.4 (50.4-403.1)	1471.8	1018.6 (624.8-1793.8)
NSS 2004	-	-	38.6	0 (0-0)	-	-	-	-	1041.5	829.6 (548.2-1262.4)
SAGE 2007-08	16.5	3.9 (0.4-12.5)	70.3	0 (0-0)	899.7	704.8 (480.6-1057.2)	830.5	294.1 (129.2-720.8)	1997.6	1218.6 (747.4-2122.5)

IQR, interquartile range; NSS 2004, National Sample Survey on Morbidity, Health Care and the Condition of the Aged 2004; NSS 2004-05, National Sample Survey on Household Consumer Expenditure 2004-05; NSS 2009-10, National Sample Survey on Household Consumer Expenditure 2009-10; OOP, out-of-pocket; SAGE 2007-08, Study on Global Ageing and Adult Health 2007-08; US\$, United States dollar; WHS 2003, World Health Survey 2003.

^a This category includes all household expenditure other than out-of-pocket health-care payments and food expenditure; in WHS 2003 and SAGE 2007-08 it includes specific items under prepaid health expenditure, such as health insurance, and in NSS 2004-05, NSS 2009-10 and SAGE 2007-08 it includes durable items.

^b The medians in this column are 0 because fewer than 25% of the households reported OOP inpatient care expenditure.

Discussion

CHE is an important indicator of the financial protection offered to patients by a health system and has been estimated for health systems throughout the world using a variety of survey instruments. Although two publications in 2009 highlighted some of the difficulties of measuring OOP payments in household surveys,^{11,12} CHE continues to be estimated with survey methods that have not been validated. Our study demonstrates that CHE estimates can vary dramatically depending on the survey instrument used. This has major implications for health policy planning not only in India, but also in other low- and middle-income countries, especially if they are striving to offer universal health coverage.

The wide variation seen between surveys in the estimates of CHE was the result of differences in OOP payments for health care and in "other" household expenditure. In WHS 2003 and SAGE 2007-08, OOP payments for outpatient and inpatient care were two to three times higher than in the other surveys. Our results suggest that most of the variation in OOP payments for outpatient care resulted from the expenditure amount reported. On the other hand, much of the variation in OOP payments for inpatient care resulted from the proportion of households that reported having incurred such payments in the most recent year. This proportion was substantially higher in WHS 2003 and SAGE 2007-08 than in the other surveys. These findings suggest that survey design has a different effect on recall in the case of outpatient and inpatient OOP payments.

The types of items used to document outpatient OOP probably influenced their estimates. More items and more specific probing can improve respondent recall, particularly with respect to minor events.^{11,17,34} WHS 2003 and SAGE 2007-08 both had specific questions about dental care and care by traditional healers, whereas the consumer expenditure surveys did not. This may account for the higher outpatient OOP payments found in WHS 2003 and SAGE 2007-08. Additionally, in lengthy questionnaires respondents tend to invest less time in trying to recall events, and this may have been true for the consumer expenditure surveys.³⁵ Conversely, it is possible that surveys fo-

Table 6. Mean and median out-of-pocket payments for outpatient and inpatient care for households that reported such payments, India

Survey	Outpatient care in most recent month			Inpatient care in most recent year		
	Percentage of households that reported OOP payment (95% CI)	OOP payment (US\$)		Percentage of households that reported OOP payment (95% CI)	OOP payment (US\$)	
		Mean	Median (IQR)		Mean	Median (IQR)
NSS 2004–05	62.0 (61.5–62.5)	6.9	3.4 (1.5–7.3)	9.2 (8.9–9.4)	203.7	88.1 (32.3–205.4)
NSS 2009–10	67.4 (66.7–68.1)	6.8	3.4 (1.5–7.5)	13.2 (12.7–13.6)	198.5	68.4 (25.7–192.9)
WHS 2003	63.2 (59.7–66.6)	25.5	11.8 (5.0–25.2)	25.9 (23.5–28.2)	268.1	92.8 (30.9–278.3)
NSS 2004	–	–	–	12.8 (12.5–13.0)	224.0	88.9 (29.7–228.3)
SAGE 2007–08	75.2 (73.3–77.0)	21.9	6.8 (2.6–15.6)	25.0 (23.3–26.7)	281.4	86.0 (24.6–245.8)

CI, confidence interval; IQR, interquartile range; NSS 2004, National Sample Survey on Morbidity, Health Care and the Condition of the Aged 2004; NSS 2004–05, National Sample Survey on Household Consumer Expenditure 2004–05; NSS 2009–10, National Sample Survey on Household Consumer Expenditure 2009–10; OOP, out-of-pocket; SAGE 2007–08, Study on Global Ageing and Adult Health 2007–08; US\$, United States dollar; WHS 2003, World Health Survey 2003.

cused on health, such as WHS 2003 and SAGE 2007–08, prime respondents to report events beyond the recall period, and this may lead them to overestimate OOP payments.^{1,35} However, studies have also shown that health care use is more commonly underreported than overreported.³⁶ Such factors may have also contributed to the substantially higher proportion of households that reported OOP payments for inpatient care in WHS 2003 and SAGE 2007–08, by comparison with the other surveys. The health survey NSS 2004 documented every event involving inpatient care separately. The fact that it collected the data from the person who was treated might lead respondents to recall each event more accurately. Interestingly, however, in this survey, the proportion of households that reported inpatient OOP payments was practically the same as in NSS 2004–05 and NSS 2009–10. Since OOP payments for inpatient care in those households that reported such expenditure were similar across surveys, one might conclude that OOP payments for inpatient care are less sensitive to the number of items in the questionnaire than OOP payments for outpatient care. The obvious reason is that being an inpatient is a major event and hence any expenditure associated with this event is more accurately remembered by households.^{1,13,35} It should be noted that the indirect costs of health care, such as transportation and lost earnings, also contribute to the financial burden incurred by households, but we did not assess them because they were not consistently documented in the surveys.

CHE estimates will be inaccurate if the estimated expenditure on “other” household items is not accurately

captured. If estimates of this other expenditure are too low, CHE may be overestimated because the denominator will be small. WHS 2003, which had the least number of items, lacked specific items for durable goods and had only a one-month recall period, was the survey that yielded the lowest estimates of “other” expenditure. Although the evidence suggests that estimates of household expenditure increase as the number of items in the questionnaire increases,¹⁷ in a health-focused survey it is highly impractical to ask questions as detailed as those that are included in consumer expenditure surveys. Thus, it is useful to note that SAGE 2007–08, which had 13 items, including durable goods, and various recall periods, had a higher estimate of “other” expenditure than WHS 2003, which included only four items. A single question, as in NSS 2004, does not appear to be enough to capture total household expenditure or expenditure on food. However, the 9 items used in SAGE 2007–08 for food expenditure provided an estimate similar to the estimates yielded by the consumer expenditure surveys. A one-week recall period yielded higher estimates of food expenditure. Other studies also suggest that one week is a more appropriate recall period for food expenditure than one month.³⁷

We cannot comment on the accuracy of the CHE estimates derived from the different surveys since none of the surveys we examined can serve as a gold standard for measuring CHE. This highlights the need for validation studies to determine what questions and methods can most accurately capture CHE. These validation studies should not only examine the accuracy of the data, but

also how to best use the data on OOP payments for outpatient care based on a relatively short recall period. Although a short recall period reduces recall error, it does not provide information about OOP payments for outpatient care in the population over a time frame more relevant for policy decisions, such as 6 months or one year.³⁶ Simply multiplying the reported expenditure by as many times as necessary to obtain an estimate for the longer period, as we have done in this study, is equivalent to assuming that the expenditure is a recurrent one within a household, which is seldom the case. Hence, it probably caused overestimation of OOP payments in a one-year period for those households that reported such expenditure for a short recall period, and underestimation of OOP payments in the remaining households. This approach, which was used by others before us as well,^{9,10,29} also leads to an overestimation of the contribution made to CHE by OOP payments for outpatient care. It might be possible to more accurately estimate how much OOP payments for outpatient care contribute to CHE, by performing longitudinal panel surveys that assess the distribution of outpatient care in households across the population over a one-year period, but studies of this kind are too costly to conduct on a regular basis. However, an occasional longitudinal study can provide validation data that would allow cross-sectional survey data for outpatient OOP payments based on a one-month recall period to be adjusted to a one-year period more accurately than simple multiplication.

Because CHE estimates and OOP payments for health care varied widely across surveys, only data from surveys

with comparable methods should be used to make longitudinal comparisons. Policy-makers should consider this limitation when formulating policies and programmes that depend on data from household surveys. Survey methods for estimating OOP payments for health care must undergo standardization to allow effective tracking and monitoring of the impact of policies designed to improve financial risk protection. With universal health coverage and financial risk protection being recognized as goals for health systems in many low- and middle-income countries, comparisons of CHE estimates from different household surveys, like the ones in this

study, should be the first step towards planning validation studies of OOP payment data in these countries. This is especially important in India, given the launch of government-subsidized health insurance programmes for poor households^{21,38} and the recommendations to reduce OOP payments made by the High Level Expert Group on Universal Health Coverage.³⁹ ■

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ملخص

التفاوتات في تقديرات الإنفاق الصحي الكارثي من الدراسات الاستقصائية الأسرية في الهند

وصحة البالغين على الصعيد العالمي في الفترة من عام 2007 إلى 2008 ضعفي تقديرات الإنفاق الصحي الكارثي من الدراسة الاستقصائية للعينة الوطنية في الفترة من عام 2004 إلى 2005 والدراسة الاستقصائية للعينة الوطنية في الفترة من عام 2009 إلى 2010 واستقصاء العينة الوطنية المعني بالمرضاة والرعاية الصحية وحالة كبار السن لعام 2004. وزادت مدفوعات المرضى الداخليين من مالهم الخاص إلى الضعفين في استقصاء الصحة العالمية لعام 2003 والدراسة المعنية بالشيخوخة وصحة البالغين على الصعيد العالمي في الفترة من عام 2007 إلى 2008 بسبب إبلاغ نسبة عالية جدا من الأسر المعيشية عن هذه المدفوعات في هذه الاستقصاءات. وعلى الرغم من ذلك، بلغ الارتفاع في تقديرات الإنفاق الأخرى في استقصاء الصحة العالمية لعام 2003 نصف الارتفاع في الاستقصاءات الأخرى نتيجة استخدام عدد صغير جدا من البنود لاستخلاص هذه النفقات. الاستنتاج نتجت التفاوتات الواسعة التي لوحظت في تقديرات الإنفاق الصحي الكارثي ومدفوعات المرضى من مالهم الخاص من الاختلافات المنهجية. ويجب توحيد أساليب الاستقصاء المستخدمة لتقييم الإنفاق الصحي الكارثي في الهند واعتمادها بغية تتبع الإنفاق الصحي الكارثي بدقة وتقييم أثر السياسات الحديثة للحد منه.

الغرض تقييم قابلية مقارنة تقديرات مدفوعات المرضى من مالهم الخاص (OOP) والإنفاق الصحي الكارثي (CHE) من الدراسات الاستقصائية الأسرية المختلفة في الهند. الطريقة تم مقارنة البيانات المعنية بالإنفاق الصحي الكارثي ومدفوعات المرضى الخارجيين والداخليين من مالهم الخاص وغيرها من أوجه الإنفاق من جميع الدراسات الاستقصائية الرئيسية الوطنية أو متعددة الولايات منذ عام 2000. (الدراسة الاستقصائية للعينة الوطنية في الفترة من عام 2004 إلى 2005 [NSS 05-2004] وفي الفترة من عام 2009 إلى 2010 [NSS 10-2009]) والثلاثة استقصاءات المركزة على الصحة (استقصاء الصحة العالمية لعام 2003 [WHS 2003]؛ واستقصاء العينة الوطنية المعني بالمرضاة والرعاية الصحية وحالة كبار السن لعام 2004 [NSS 2004]؛ والدراسة المعنية بالشيخوخة وصحة البالغين على الصعيد العالمي في الفترة من عام 2007 إلى 2008 [SAGE 08-2007]). واستخدمت جميع الدراسات الاستقصائية عدا الدراسة الاستقصائية للعينة الوطنية في الفترة من عام 2004 إلى 2005 وفي الفترة من عام 2009 إلى 2010 استبيانات مختلفة. النتائج بلغت تقديرات الإنفاق الصحي الكارثي من استقصاء الصحة العالمية لعام 2003 والدراسة المعنية بالشيخوخة

摘要

印度家庭调查得到的灾难性卫生支出估算差异

目的 从印度不同家庭调查中评估自付 (OOP) 支出和大病支出 (CHE) 估计的可比性。

方法 对 2000 年以来所有重要全国性或多个邦的调查所得到 CHE、门诊和住院 OOP 费用及其他开支的数据进行比较。这些调查包括两个消费支出调查 (2004-05 [NSS 2004-05] 和 2009-10 [NSS 2009-10] 全国抽样调查) 和三个以健康为中心的调查 (2003 年世界卫生调查 [WHS 2003]、2004 年全国老年人发病率、健康护理和状况抽样调查 [NSS 2004] 以及全球老龄化与成人健康研究 2007-08 [SAGE 2007-08])。除 NSS 2004-05 和 NSS 2009-10 以外，所有调查都使用不同的问卷。

结果 来自 WHS 2003 和 SAGE 2007-08 的 CHE 估算是 NSS 2004-05、NSS 2009-10 和 NSS 2004 的两倍。在 WHS 2003 和 SAGE 2007-08 中估计的住院护理 OOP 费用也是 WHS 2003 和 SAGE 2007-08 的两倍，这是因为这些调查中报告有此类费用的家庭比例高得多。然而，较之其他调查，WHS 2003 的估计费用仅为一半，原因是计算这些费用使用的项目数量很少。

结论 不同方法得到的 CHE 和 OOP 支出估算差异很大。用来评估印度 CHE 的方法需要标准化并经过验证，以准确地跟踪 CHE 并评估最近旨在减少开支的政策的效果。

Résumé

Estimation des variations des dépenses de santé catastrophiques à partir d'enquêtes menées auprès des ménages en Inde

Objectif Évaluer la comparabilité des paiements directs (PD) et estimer les dépenses de santé catastrophiques (DSC) à partir de différentes enquêtes menées auprès des ménages en Inde.

Méthodes Les données recueillies dans toutes les grandes enquêtes nationales ou multi-régionales depuis 2000 et portant sur les DSC, les paiements directs pour hospitalisation interne et externe et autres dépenses, ont été comparées. Parmi ces études, figurent notamment deux enquêtes portant sur les dépenses des consommateurs (l'enquête nationale pour 2004–2005 [NSS 2004–05] et pour 2009–2010 [NSS 2009–10]), et trois enquêtes axées sur la santé (l'enquête sur la santé dans le monde 2003 [WHS 2003]; l'enquête nationale sur la morbidité, les soins de santé et la condition des personnes âgées 2004 [NSS 2004]; et l'étude sur le vieillissement et la santé des adultes 2007–2008 [SAGE 2007–08]). Toutes ces enquêtes, à l'exception de la NSS 2004–05 et de la NSS 2009–10, ont utilisé des questionnaires différents.

Résultats Dans les enquêtes WHS 2003 et SAGE 2007–08, les DSC étaient deux fois plus élevées que celles relevées dans les enquêtes NSS 2004–05, NSS 2009–10 et NSS 2004. Les paiements directs pour une hospitalisation interne étaient deux fois plus élevés dans les enquêtes WHS 2003 et SAGE 2007–08, car, dans ces enquêtes, une proportion beaucoup plus élevée de ménages ont déclaré ces paiements. Cependant, d'autres dépenses estimées étaient deux fois moins élevées dans l'enquête WHS 2003 que dans les autres enquêtes, car un très petit nombre de questions ont été utilisées pour rendre compte de ces dépenses.

Conclusion Les grandes variations observées dans les DSC et les estimations de paiements directs résultent de différences méthodologiques. Les méthodes d'enquête utilisées pour évaluer les DSC en Inde doivent être standardisées et validées pour évaluer les DCS avec précision et mesurer l'impact des politiques récentes pour les réduire.

Резюме

Разброс данных об уровне катастрофических расходов на медицинское обслуживание, полученных в ходе социологических исследований в домохозяйствах Индии

Цель Оценить соотношение данных о размере оплаты медицинского обслуживания из собственных средств (ОСС) к уровню катастрофических расходов на медицинское обслуживание (КРМ), полученных в ходе нескольких социологических исследований в Индии.

Методы Был выполнен сравнительный анализ данных по уровню КРМ, размеру ОСС в стационарном и амбулаторном здравоохранении, а также по другим расходам, полученных в рамках всех крупных национальных и международных социологических исследований, проводившихся с 2000 года, в том числе двух социологических исследований структуры потребительских расходов (Национальных выборочных исследований 2004–05 гг. [НВИ 2004–05] и 2009–10 гг. [НВИ 2009–10]) и трех социологических исследований медицинской направленности (Всемирного обследования состояния здоровья 2003 г. [ВОЗ 2003]; Национального выборочного социологического исследования по вопросам заболеваемости, здравоохранения и состояния здоровья пожилых 2004 г. [НВИ 2004]; и Исследования глобальной проблематики старения и здоровья взрослых 2007–08 гг. [ИГСП 2007–08]). Во всех исследованиях, кроме НВИ 2004–05

и НВИ 2009–10, использовались разные анкеты.

Результаты Данные по уровню КРМ, полученные в ходе исследований ВОЗ 2003 и ИГСП 2007–08, превышают данные исследований НВИ 2004–05, НВИ 2009–10 и НВИ 2004 в два раза. Данные по уровню ОСС в стационарном здравоохранении, полученные в ходе исследований ВОЗ 2003 и ИГСП 2007–08, вдвое выше значений, полученных в ходе других исследований ввиду того, что доля домохозяйств, участвовавших в этих двух исследованиях и сообщивших об уплате ОСС, была существенно выше. Тем не менее, данные о других затратах, полученные в ходе исследования ВОЗ 2003, оказались вполнину ниже, чем по версии других исследований, поскольку число показателей, на основе которых осуществлялась их оценка, было крайне невелико.

Вывод Причиной большого разброса данных об ориентировочной величине КРМ и ОСС является методика исследования. Точность наблюдений за КРМ в Индии и оценка эффективности проводимой в последнее время политики по его уменьшению требует стандартизации и верификации методов социологических исследований, применяемых для оценки КРМ.

Resumen

Variaciones en las estimaciones de los gastos sanitarios catastróficos en la India

Objetivo Evaluar la comparabilidad de las estimaciones del pago por el propio paciente (OOP) y los gastos sanitarios catastróficos (CHE) a partir de distintas encuestas a hogares de la India.

Métodos Se compararon los datos sobre los gastos sanitarios catastróficos (CHE), los pagos por el propio paciente (OOP) por el cuidado sanitario ambulatorio y hospitalario, así como otros gastos de las principales encuestas nacionales o plurinacionales desde 2000. Estos incluyen dos encuestas sobre los gastos de consumo (la Encuesta Nacional por Muestreo de 2004–05 [ENM 2004–05] y 2009–10 [ENM 2009–10]) y tres encuestas sobre salud (la Encuesta Mundial de Salud de 2003 [EMS 2003], la Encuesta Nacional por Muestreo de morbilidad, cuidado sanitario y de las condiciones de la tercera edad de 2004 [ENM 2004], y el Estudio sobre el Envejecimiento mundial de la población

y la salud de los adultos de 2007–08 [SAGE 2007–08]). Se emplearon cuestionarios diferentes en cada una de ellas, excepto para la ENM 2004–05 y la ENM 2009–10.

Resultados Las estimaciones de los gastos sanitarios catastróficos (CHE) de la EMS 2003 y del Estudio sobre el Envejecimiento mundial de la población y la salud de los adultos (SAGE) de 2007–08 fueron dos veces más altas que las de la ENM 2004–05, ENM 2009–10 y ENM 2004. Las estimaciones del pago por el propio paciente (OOP) fueron dos veces más altas en la EMS 2003 y el SAGE 2007–08 debido a que en estos estudios una proporción mucho mayor de los hogares informó acerca de dichos pagos. Sin embargo, otros gastos estimados fueron la mitad en la EMS 2003 y en las otras encuestas porque se utilizó un número muy pequeño de elementos para captar dichos gastos.

Conclusión Las grandes variaciones observadas en las estimaciones de los gastos sanitarios catastróficos (CHE) y los pagos por el propio paciente (OOP) se debieron a diferencias metodológicas. Es necesario estandarizar y validar los métodos de encuesta utilizados para evaluar

los gastos sanitarios catastróficos (CHE) en la India a fin de realizar un seguimiento preciso sobre dichos gastos y evaluar el impacto de las políticas recientes para reducirlos.

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