

Reducing out-of-pocket expenditures to reduce poverty: a disaggregated analysis at rural-urban and state level in India

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Out-of-pocket (OOP) expenditure on health care has significant implications for poverty in many developing countries. This paper aims to assess the differential impact of OOP expenditure and its components, such as expenditure on inpatient care, outpatient care and on drugs, across different income quintiles, between developed and less developed regions in India. It also attempts to measure poverty at disaggregated rural-urban and state levels.

Based on Consumer Expenditure Survey (CES) data from the National Sample Survey (NSS), conducted in 1999–2000, the share of households' expenditure on health services and drugs was calculated. The number of individuals below the state-specific rural and urban poverty line in 17 major states, with and without netting out OOP expenditure, was determined. This also enabled the calculation of the poverty gap or poverty deepening in each region.

Estimates show that OOP expenditure is about 5% of total household expenditure (ranging from about 2% in Assam to almost 7% in Kerala) with a higher proportion being recorded in rural areas and affluent states. Purchase of drugs constitutes 70% of the total OOP expenditure. Approximately 32.5 million persons fell below the poverty line in 1999–2000 through OOP payments, implying that the overall poverty increase after accounting for OOP expenditure is 3.2% (as against a rise of 2.2% shown in earlier literature). Also, the poverty headcount increase and poverty deepening is much higher in poorer states and rural areas compared with affluent states and urban areas, except in the case of Maharashtra. High OOP payment share in total health expenditures did not always imply a high poverty headcount; state-specific economic and social factors played a role.

The paper argues for better methods of capturing drugs expenditure in household surveys and recommends that special attention be paid to expenditures on drugs, in particular for the poor. Targeted policies in just five poor states to reduce OOP expenditure could help to prevent almost 60% of the poverty headcount increase through OOP payments.

Keywords Out-of-pocket expenditures, impoverishment, household surveys, equity, India

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KEY MESSAGES

- Expenditure on drugs was found to constitute the major part (70%) of out-of-pocket (OOP) health care expenditure in India.
- Both the increase in the number of poor as a result of OOP expenditure, and poverty deepening, were higher in rural areas and poorer states than in urban areas and wealthier states.
- Policymakers need to target specific areas and specific populations in certain states where the poverty impact of OOP payments is greatest. Targeted policies in just five poor states to reduce OOP expenditure could help to prevent almost 60% of the increase in poverty headcount due to OOP payments.

Introduction

The Millennium Development Goals (MDGs) have put health at the heart of the development agenda, with three out of eight Goals directly related to improvement in health status. These goals and targets emphasize the importance of health as a dimension of poverty. This paper examines one of the financing dimensions of health—out-of-pocket (OOP) expenditure—and shows how large OOP expenditures exacerbate poverty in India.

OOP spending is an inefficient way of financing health care. It can have a negative impact on equity and can increase the risk of vulnerable groups slipping into poverty. Several studies have documented the consequences of a high share of OOP payments in total health financing in developing countries (Berki 1986; Peters *et al.* 2002; Wagstaff and Van Doorslaer 2003; Krishna 2004; Russell 2004; van Doorslaer *et al.* 2006), with a higher poverty incidence and a larger proportion of households facing catastrophic expenditures (Xu *et al.* 2003; O'Donnell *et al.* 2007).

The Indian perspective

In India, health expenditure accounts for less than 5% of the Gross Domestic Product (GDP), with OOP payments constituting the single largest component of total health expenditure.¹ Estimates for OOP health expenditure between 1995–96 and 2000–01 vary from 80% (Peters *et al.* 2002) to about 70% of total health expenditure (NCMH 2005; WHO 2006). While these proportions are much higher than the 25–50% range in several developing and developed countries,² they vary widely across Indian states (Garg 2001a, b; Government of India 2005). Further, OOP payments constitute 95% of private health expenditures, with a weak insurance system and other community-based financing still only emerging (Ahuja 2004; Garg 2006; Government of India 2005; Mahal *et al.* 2005). As a result, OOP health expenditure also forms a substantial proportion of total household spending, constraining expenditure on necessities, and leading to a loss of welfare both at micro (household) and at macro (national) levels (Russell 2004).

OOP health expenditure comprises various types of payments made by households on health care. Recent studies show that expenditure on medicines accounts for a substantial proportion. The report of the National Commission for Macro-economics and Health (NCMH 2005, p.64) notes that 'drugs are one of the three cost drivers of the health care system'. Sakthivel (2005)

finds that three-quarters of total OOP health expenditure is spent on drugs.

While the high share of OOP payments in overall health financing caught the attention of policymakers in India during the early 1990s, the impact of OOP health expenditure on households has been studied only recently (Peters *et al.* 2002; Krishna 2004; Garg and Karan 2006; NCMH 2005; Van Doorslaer *et al.* 2006). For example, while analysing health expenditure and utilization using National Sample Survey (NSS) data for 1995–96, Peters *et al.* (2002) showed that the deduction of OOP payments from household expenditures lowered the national poverty line by 2.2%, i.e. 2.2% of the population fell into poverty because of OOP payments. Further, they pointed out that a quarter of hospital patients were impoverished by the cost of OOP payments due to hospitalizations, and there were high levels of borrowing and selling of assets to make these payments. In another study, van Doorslaer *et al.* (2006) also highlight that OOP payments alone forced more than 37 million people in India below the \$1³ poverty line in 1999–2000.

Overall, payments for health care seem progressive in India, implying that the rich pay a higher proportion of the total expenditure on health care than the poor. This is true for both taxation-based health finance as well as OOP payments (Mahal *et al.* 2001; Peters *et al.* 2002; Mahal 2003; O'Donnell *et al.* 2007). What needs to be examined here is how the progressivity of OOP payments can be justified with wide inequalities in living standards across population groups and geographical regions. With such large variations in the socio-economic conditions across states and between rural and urban settings, it is imperative to assess the magnitude and impact of OOP expenditure at the disaggregated level, and to observe its impact on the poor.

Objectives

This paper argues that despite OOP payments being progressive at an all-India level, they have differential impacts across rural and urban settings, and across Indian states. Based on data from the Consumer Expenditure Survey (CES) in 1999–2000 (Government of India 2001), the paper explores the components of OOP payments on health care. More specifically, the paper analyses at decentralized levels:

- the magnitude and distribution of OOP payments;
- the components that trigger OOP payments; and
- the incidence and intensity of poverty that occurs because of OOP payments.

Apart from providing an in-depth analysis of OOP payments and their impact on the living standards of households, the paper also critically examines and updates earlier results. The present analysis, however, does not address the impact of OOP payments on the quantity and quality of health care utilized. Neither does it capture other potential effects of illness or disability, which may include direct and/or indirect loss of income, forgone consumption of needed health care, etc. Furthermore, the analysis is based on data for a single year which does not allow the investigation and dynamics of whether health shocks can be absorbed via consumption across several periods, through borrowing or dis-saving opportunities.

The paper is organized as follows. The next section presents the data and methods. This is followed by the findings, starting with all-India figures and continuing with state level results. These findings are then discussed. We finish with conclusions and recommendations for policy interventions.

Methods

The paper is based on households' consumption expenditure data collected in India by the National Sample Survey Organisation (NSSO)⁴ for the year 1999–2000. This is the latest available large CES⁵ with a sample of more than 120 000 households (71 000 rural and 49 000 urban). Since consumption expenditure data are collected at household level, the analysis in this paper is based on household expenditure rather than individual expenditure.

In the CES, the NSSO collects data on household expenditure on a wide range of items, including expenditure on health services and commodities for institutional and non-institutional care. The recall period in the surveys is 'last one year' for expenditure on institutional care and 'last 30 days' for expenditure on non-institutional care. Health expenditures for institutional and non-institutional care are recorded separately under:

- (a) purchase of drugs and medicines;
- (b) expenditure incurred on clinical tests such as pathological tests, ECG, X-ray etc.;
- (c) professional fees of doctors, nurses etc.;
- (d) payments made to hospitals and nursing homes for medical treatment;
- (e) family planning appliances including IUD (intra-uterine device), oral pills, condoms, diaphragm, spermicide, etc.; and
- (f) 'other health expenditures' not recorded above.

The available data at the unit level are added for all these items to obtain total expenditures for institutional and non-institutional care. Drugs and medicines expenditures are subtracted from each of the institutional and non-institutional totals to provide total expenditures on inpatient and outpatient care services, respectively. Adding together the drugs and medicines expenditures under the institutional and non-institutional categories provides the total expenditure on drugs and medicines.

The poverty impact of OOP payments is defined as the difference between the average level of poverty before

health care payments and that after payments (Wagstaff and Doorslaer 2003). It is measured by comparing both the prevalence (headcount ratio) and the intensity of poverty before and after OOP health payments. The pre-OOP (or pre-payment) poverty headcount is calculated by comparing households' consumption expenditure gross of payments for health care with a poverty line as defined by the Planning Commission of India (2001). The pre-payment headcount of poverty (or pre Hp, which has also been the basis for calculating the poverty headcount by the Planning Commission) can be measured as:

$$\text{pre } H_p = 1/n \sum 1 (x_i \leq PL) \quad (1)$$

where, x_i is per capita consumption expenditure (in Rupees), PL is the poverty line (in Rupees) and n is the number of individuals.

Similarly, the post-OOP payment 'poverty headcount' is computed by netting out health care payments (measured by actual OOP payments for all households) from households' consumption expenditure and then comparing with the poverty line, i.e.

$$\text{post } H_p = 1/n \sum 1 ((x_i - \text{OOP}) \leq PL) \quad (2)$$

Similarly, intensity of poverty, also known as poverty deepening, is measured by calculating the average 'poverty gap' as defined by:

$$\text{pre } G = 1/n \sum P_i (PL - x_i) \quad (3)$$

and

$$\text{post } G = 1/n \sum P_i (PL - (x_i - \text{OOP})) \quad (4)$$

where $P_i = 1$ if $x_i \leq PL$ and is zero otherwise.

OOP being positive, equation (2) results in a higher headcount ratio and greater number of individuals below the poverty line (PL) compared with that for equation (1).

The additional number of individuals moving below the poverty line because of OOP expenditures is provided by:

$$H_p = \text{post } H_p - \text{pre } H_p$$

Similarly, the 'average poverty gap', or poverty deepening in terms of the average amount by which people go below the poverty line because of OOP expenditures, is measured by:

$$G = \text{post } G - \text{pre } G$$

Lastly, to facilitate comparison of poverty gaps computed for different poverty lines (across different states and regions), it is useful to express the mean gap as a multiple of the poverty line.⁶ This is known as the normalized poverty gap, $NG = G/PL$. The gap is also standardized with the headcount and this, known as the mean positive poverty gap, $MPG = G/H_p$, depicts the average consumption shortfall because of OOP payments for the poor.

Since the NSSO bases its data on sample surveys, we calculate all our estimates by applying the inbuilt weighting system of the NSSO. However, even after applying the inbuilt weights, the total population estimated by the NSSO is usually an underestimate for a particular year. For example, for the year 1999–2000, the NSSO report estimates approximately 7% less population when compared with the interpolated Census data for the same year. The poverty headcounts both pre- and

post-OOP payments in this paper have been calculated by adjusting with the interpolated Census population data for 1999–2000.

Key findings

National level

OOP expenditure estimates

Approximately 30% of all households do not report OOP expenditure, with a slightly lower proportion for urban areas. Average monthly per capita OOP payment in 1999–2000 was Rs. 33 (\$0.8), with Rs. 43.3 (\$1) in urban areas and Rs. 29.6 (\$0.7) in rural India. Those in the richest 20% of the population spent on average 10 times more than those in the poorest 20% (Rs. 100 in rural and Rs. 133 in urban areas compared with Rs. 9 in rural and Rs. 14 in urban areas, respectively) (Table 1).

OOP payments constitute 4.8% of total consumption expenditure, which is equal to 10.7% of total non-food expenditure at an all-India level. The proportions are lower in urban areas than in rural areas. The proportion of OOP payments in household total as well as non-food expenditure increases with an increase in levels of consumption expenditure both in rural and urban areas. This progressive nature of OOP expenditure is more pronounced in rural than in urban areas. In urban regions, this trend becomes weaker and in fact reverses at the two highest consumption levels when OOP payments are measured as a proportion of non-food expenditure (Table 1).

The rural–urban differential in the progressiveness of the OOP payment share of total household consumption expenditure can also be seen with the help of concentration curves for OOP payment share and household consumption expenditure (Figure 1). The concentration curves for the OOP payment shares are lower than those for household consumption expenditure (Lorenz curve), implying progressivity of OOP payments both in rural and in urban areas. However, the closeness of the concentration curve for OOP share to the Lorenz curve for urban

areas, and the opposite for rural areas, is noteworthy. The gap between the Lorenz curve and the curve for OOP payment share indicates the relative inequality of OOP expenditure in comparison with the inequality in household consumption expenditure, also denoted as the ability to pay (ATP). Hence, the respective gaps between the Lorenz curve and the curve for OOP payment share in rural and urban areas suggest that OOP expenditure is highly

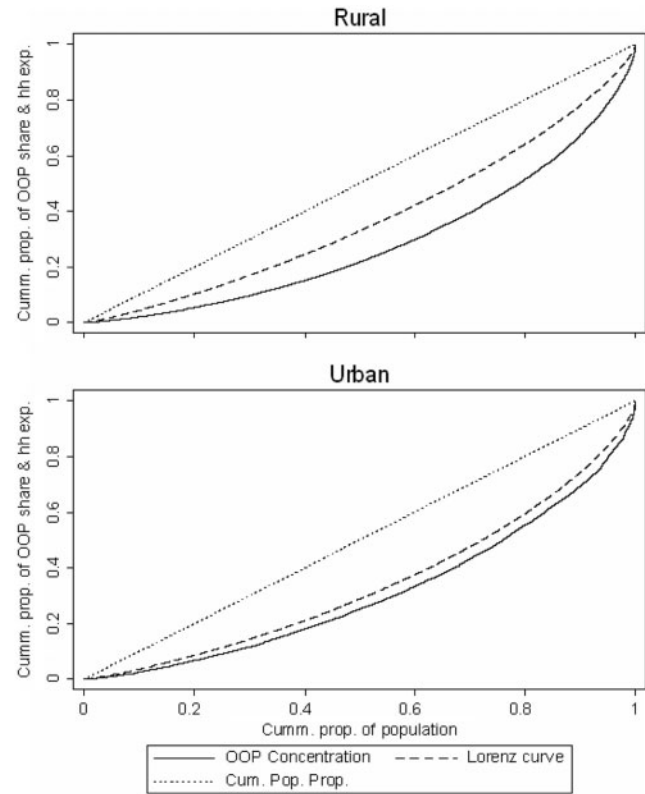


Figure 1 Concentration curves of OOP payments in rural and urban India, 1999–2000

Table 1 Average monthly per capita OOP expenditure (in Rs.) and average OOP share (%) to total and non-food consumption expenditure by quintile groups for rural, urban and combined areas in India, 1999–2000

Consumption expenditure quintile*	Rural			Urban			Combined		
	Average of OOP shares as % of			Average of OOP shares as % of			Average of OOP shares as % of		
	Average per capita OOP spending (in Rs.)	Total consumption expenditure	Non-food consumption expenditure	Average per capita OOP spending (in Rs.)	Total consumption expenditure	Non-food consumption expenditure	Average per capita OOP spending (in Rs.)	Total consumption expenditure	Non-food consumption expenditure
Poorest 20%	9.02	3.1	8.3	13.84	3.5	8.4	10.25	3.2	8.3
2 nd poorest 20%	16.33	4.1	10.3	25.28	4.2	9.1	18.53	4.1	10
Middle	24.86	4.9	11.6	39.74	4.6	9.3	28.49	4.8	11
2 nd richest 20%	40.98	6.1	13.4	56.06	4.6	8.6	44.74	5.7	12
Richest 20%	100.38	8.3	15.7	132.99	5.3	8.3	109.18	7.4	13.4
All households	29.62	5	11.5	43.53	4.4	8.8	33.12	4.8	10.7
Standard error	0.700	0.029	0.025	0.338	0.032	0.026	0.318	0.022	0.019
N	71 385			48 924			120 309		

Note: In 1999–2000, Rupees (Rs). 43.3 = US\$1.

*Quintile groups are made separately for rural and urban areas.

concentrated among the rich in rural areas, while it is largely distributed in accordance with the ATP of population groups in urban areas. The concentration index⁷ of OOP payment share to total household consumption expenditure is estimated to be (+)0.194 in rural areas compared with (+)0.079 in urban areas. The corresponding standard errors are 0.004 in rural and 0.007 in urban areas.⁸ The very low value of the concentration index of OOP payments in urban areas signifies a very small difference between inequity in OOP payments and inequity in ATP.

In order to identify the relative contribution of the main components of OOP expenditure, we attempt here to separate household expenditures on drugs from the overall expenditure on institutional and non-institutional health care. Expenditure on drugs is the single largest component of OOP payments across all consumption quintiles in both rural and urban areas, constituting up to 60% of total expenditure on institutional (or inpatient) care and 85% of non-institutional (outpatient) expenditure. Altogether expenditure on drugs is approximately 75% of OOP expenditure; 77% in rural areas and a little less than 70% in urban areas. Overall, richer quintiles spend a lower proportion of OOP expenditure on drugs compared with poorer quintiles, both in rural and in urban areas. However, even in the top quintile, who are also the top beneficiaries of institutional health care services (Mahal *et al.* 2001), the share of OOP payments earmarked for drug purchases is as high as 70% in rural and 60% in urban areas. For the poorest quintile the share is 86% in rural and 83% in urban areas (Table 2). These estimates (particularly estimates of drugs share in rural areas) should, however, be treated with caution. Given the survey design of the NSSO, expenditure on drugs by households in rural areas cannot be separated from total OOP

expenses for every household in the case of non-institutional care. Although the magnitude of such contamination is not discernable from the present database, the NSSO instruction manual recognizes this problem only in the case of non-institutional care in rural areas.

The average monthly per capita expenditure on drugs in India is Rs. 25 (Rs. 23 and Rs. 30 in rural and urban areas, respectively). This amounts to an estimated Rs. 250 billion (US\$5.7 billion) in total annual expenditure on drugs by households in India for the year 1999–2000 [approximately Rs. 180 billion (US\$4.1 billion) for rural and Rs. 70 billion (US\$1.6 billion) for urban India]. This excludes the total government procurement of drugs worth approximately Rs. 20 billion (US\$0.5 billion) in the year 1999–2000 (Sakthivel 2005). The estimated value of the total drugs supply in the retail markets in India for the same year is nearly Rs. 200 billion (US\$4.6 billion).⁹ The difference between the estimate of expenditure on drugs by households and the value of total supply of drugs in retail markets is therefore about Rs. 50 billion (US\$1.1 billion) for the year 1999–2000.

Poverty estimates

The increase in number of poor after accounting for OOP payments is 3.2% (3.5% in rural areas and 2.5% in urban). The pre-payment headcount (pre Hp) in 1999–2000 is 25.9%¹⁰ and post-payment headcount (post Hp) after deducting the OOP payment from total consumption expenditure is 29.2%. The additional number of persons falling into poverty is 32.5 million, with 25.5 million in rural and 7 million in urban areas. Seventy-nine per cent of the incremental poor are from rural areas (more than the rural share of the

Table 2 Percentage share of OOP expenditure on institutional and non-institutional health care and drugs in rural and urban India, 1999–2000

	Consumption expenditure quintile					All households	Standard error
	Poorest 20%	2nd poorest 20%	Middle	2nd richest 20%	Richest 20%		
Rural							
Institutional care	3.28	4.72	6.76	9.15	14.84	9.86	0.064
Non-institutional care	10.59	10.66	10.39	11.59	15.97	12.87	0.233
Institutional drugs	9.47	9.49	12.41	12.74	14.65	12.71	0.123
Non-institutional drugs	76.66	75.13	70.44	66.52	54.54	64.56	0.270
Total drugs	86.13	84.62	82.85	79.26	69.19	77.28	0.270
Urban							
Institutional care	5.90	8.66	11.20	14.03	22.08	15.16	0.094
Non-institutional care	10.84	12.48	13.76	15.44	17.81	15.23	0.110
Institutional drugs	10.87	12.04	13.68	13.29	14.31	13.36	0.143
Non-institutional drugs	72.39	66.82	61.36	57.24	45.80	56.25	0.194
Total drugs	83.26	78.86	75.04	70.53	60.11	69.61	0.194
Combined							
Institutional care	4.20	6.03	8.27	10.68	17.23	11.61	0.053
Non-institutional care	10.68	11.27	11.54	12.79	16.58	13.65	0.158
Institutional drugs	9.96	10.34	12.84	12.91	14.53	12.93	0.094
Non-institutional drugs	75.17	72.36	67.35	63.62	51.66	61.82	0.189
Total drugs	85.13	82.70	80.19	76.53	66.19	74.75	0.189

Table 3 Poverty increase after accounting for OOP payments: poverty headcounts and poverty gaps, India, 1999–2000

Poverty measures	Rural	Urban	Combined
Poverty headcounts (in %)			
Pre-payment headcount (pre-Hp)	26.84 (0.165)	23.53 (0.193)	25.93 (0.126)
Post-payment headcount (post-Hp)	30.35 (0.173)	26.06 (0.201)	29.17 (0.132)
Poverty impact – headcount (post-Hp – pre-Hp)	3.51 (0.076)	2.53 (0.079)	3.24 (0.056)
Poverty gaps (in Rs.)			
Pre-payment gap (pre-G)	17.11 (0.138)	23.35 (0.255)	18.69 (0.124)
Post-payment gap (post-G)	19.97 (0.150)	26.56 (0.275)	21.63 (0.134)
Poverty impact – gap (post-G – pre-G)	2.85 (0.039)	3.21 (0.066)	2.94 (0.033)
Normalized poverty gaps (in %)			
Pre-payment normalized gap (pre-NG)	5.22 (0.042)	5.14 (0.054)	5.17 (0.033)
Post-payment normalized gap (post-NG)	6.10 (0.045)	5.85 (0.058)	5.99 (0.035)
Normalized poverty impact (post-NG – pre-NG)	0.87 (0.0112)	0.71 (0.0137)	0.82 (0.009)

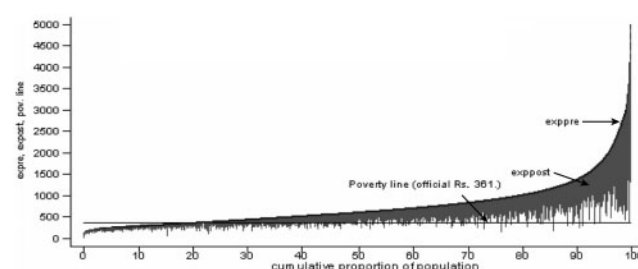
Notes: Figures in parentheses are Standard Errors.

The estimates of poverty headcount are slightly lower than the official estimates of poverty (26.1%) by Planning Commission of India (2002); mainly because the estimate of poverty ratio based on unit level data in north eastern states is much lower than the official figures. The official poverty ratio takes a common figure for all north eastern states which is that of Assam.

total population) and 21% are from urban areas (Table 3). These figures do not include persons already below the poverty line and who are pushed further down to acute poverty due to OOP payments.

At the national level, the consumption level of the poor dips by an average of Rs. 3 per capita per month because of OOP payments, which also serves to measure poverty deepening or the increase in the poverty gap. The intensity of the poverty gap is higher in urban areas (Rs. 3.21) than in rural areas (Rs. 2.85) but the normalized poverty gap, which is standardized by respective poverty lines, is higher in rural areas (0.87%) than in urban areas (0.71%). This shows that the relative burden in rural areas is much greater. The impact of OOP payments on poverty can be clearly observed with the help of a Pen parade graph (Figure 2).

The Pen parade graph plots households' pre-payment as well as post-payment per capita consumption against the cumulative percentage of individuals ranked by pre-payment consumption (upper boundary of the Pen parade). The x-axis, at the intersection of the pre-payment curve with the national poverty line (horizontal line set at Rs. 361 for 1999–2000), measures the poverty headcount. As indicated by this point in the graph, the pre-payment poverty ratio (which is also the official estimate of poverty in India) is 26%. The 'paint drops' from the pre-payment curve depict the consumption expenditure of individuals who are pulled below the pre-payment curve because of OOP payments. The lower boundary of the 'paint drops' plots the post-payment curve. The proportion below the poverty line is the post-payment headcount of poverty, which is 29.5%. The difference in the two headcounts measured again on the x-axis is the poverty headcount impact of the OOP payment and is 3.2%. The area below the poverty line and that above the pre-payment curve shows the extent of poverty gap. It is clear that many individuals below the poverty line are dragged further down by medical expenses when these are netted out. There are also many individuals

**Figure 2** Pre-payment and post-payment consumption expenditure, 1999–2000

Notes: Expre – Shows monthly per capita expenditure before OOP. Expost – Monthly per capita expenditure of households after OOP.

in the middle of the gross expenditure distribution and some at the high end of pre-payment consumption who are pulled below the poverty line by OOP payments. It is evident from the figure that for households just above the poverty line even a small expenditure on OOP payments will drop them below the poverty line.

OOP expenditures and poverty differentials across states

OOP expenditure differentials

In general, OOP payment share in total expenditure is found to be higher in high-income states than in poor states (Pearson correlation coefficient is (+)0.5 between per capita state domestic product and OOP share in total consumption expenditures). Developed states such as Punjab, Haryana, Maharashtra and Kerala have a higher share of OOP expenditure in consumption expenditures (5% or above) compared with the 2–4% range in poorer states such as Bihar, Jammu and Kashmir, Orissa, Rajasthan and Assam. An exception is Uttar Pradesh, a poorer state, with an OOP share at 6.5%, just below

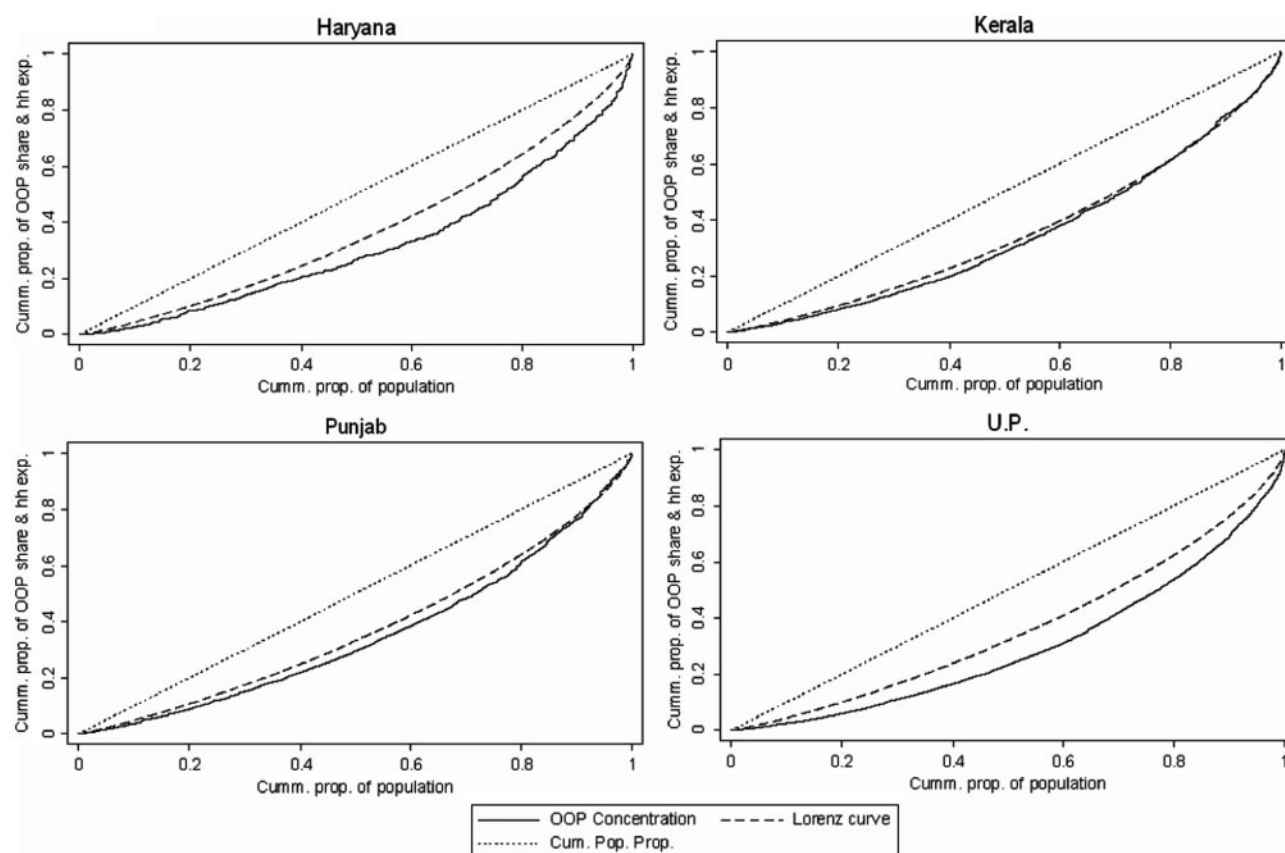


Figure 3 Concentration curves of OOP payments in four states with high OOP share, 1999–2000

the highest level in Kerala. Kerala, which has the highest rank in terms of human development indicators in India, has the highest OOP expenditure share, at over 7%. Two higher income states, namely Gujarat and Tamil Nadu, show a contrasting picture from the general trend.

While all the poor states are characterized by lower per capita annual OOP expenditures (between Rs. 400–800), all high-income states except Maharashtra are characterized by annual per capita OOP expenditures of more than Rs. 1000. Most middle-income states, such as West Bengal, Andhra Pradesh, Karnataka and Himachal Pradesh, have shares of OOP expenditures between 4–5% of total expenditure, and per capita annual OOP expenditures ranging from Rs. 500–850. The states of Orissa, Assam and Rajasthan, characterized by mass poverty, have the lowest annual per capita OOP expenditure (less than Rs. 600), and Assam and Bihar have the lowest OOP payment shares in total household consumption expenditure at 2 and 3.8%, respectively.

The pattern of OOP payment across quintile groups was examined in the four states of Haryana, Punjab, Uttar Pradesh and Kerala, which have very high levels of OOP expenditure, over 6%, and per capita private expenditures of over Rs. 1000, but which vary extensively in levels of development.¹¹ To illustrate the distribution of OOP payments in these four states, the concentration curves of OOP payments are presented in Figure 3.

In these states, the concentration curves of OOP payments lie below the concentration curves for total consumption expenditure, implying that OOP expenditure increases with an increase in consumption expenditure in all these states. The difference across these four states lies in terms of the intensity of the OOP payments share between the rich and the poor, as indicated by the difference between the two concentration curves (the OOP concentration curve and the Lorenz curve). This gap is lowest in Kerala and highest in Uttar Pradesh. In Haryana and Uttar Pradesh, the gap widens only among the upper consumption quintiles, implying that OOP payments are largely concentrated among higher consumption quintiles. In Punjab and Kerala, OOP payments are largely distributed in accordance with the ATP.

Our findings suggest that share of expenditure on drugs in total OOP expenditure is lower in developed states. For example, in poorer states like Bihar, Orissa, Uttar Pradesh, Jammu and Kashmir, and Rajasthan, share of expenditure on drugs is as high as 90% or more. In more developed states like Maharashtra, Tamil Nadu, Gujarat and Karnataka, it is 70% or less, implying comparatively higher expenditure on institutional and/or non-institutional care. In Kerala and Gujarat, the share of OOP expenditure on institutional care is higher than in all other states, and in Tamil Nadu, Karnataka, Maharashtra and West Bengal, OOP share on non-institutional care is among the highest.

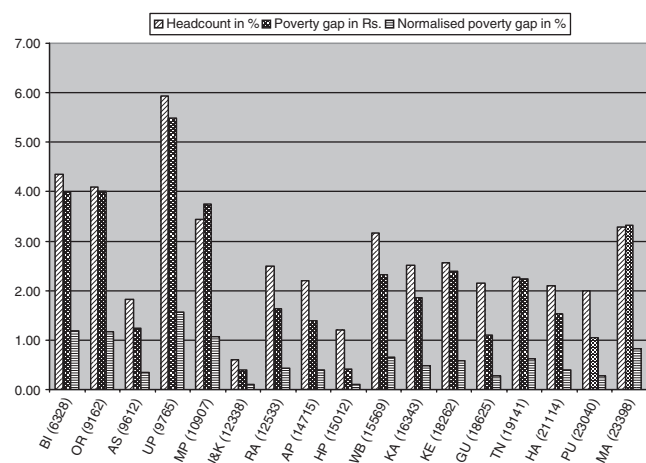


Figure 4 Poverty headcount and poverty gap as a result of OOP expenditures in major Indian states, 1999–2000.

Notes: Analysis has been done for 17 major states. The acronyms for states are: AP – Andhra Pradesh; AS – Assam; BI – Bihar; GU – Gujarat; HA – Haryana; HP – Himachal Pradesh; J&K – Jammu and Kashmir; KA – Karnataka; KE – Kerala; MA – Maharashtra; MP – Madhya Pradesh; OR – Orissa; PU – Punjab; RA – Rajasthan; TN – Tamil Nadu; UP – Uttar Pradesh; WB – West Bengal.

Figures in parentheses against the state names are per capita state domestic product in Rupees (Rs.). Data for Bihar, Madhya Pradesh and Uttar Pradesh relate to erstwhile states before their bifurcation.

Poverty differentials

The poverty impact of OOP expenditure shows that states with a relatively low per capita state domestic product have a higher increase in poverty incidence (headcount) and intensity (gap) compared with richer states (Pearson correlation coefficient of (-0.392) and (-0.395) , respectively, significant at the 10% level). Exceptions are Assam among the poor and Maharashtra among the rich states (Figure 4).

Among all the major states, Uttar Pradesh shows the highest increase in poverty, followed by three other poor states: Bihar, Orissa and Madhya Pradesh. These four states taken together constitute 58% of the total increase in poverty headcount because of OOP payments. In Uttar Pradesh alone, a 6% increase in the poverty ratio implies more than 10 million persons or over one-fifth of the state's total number of poor have fallen into poverty through OOP payments. Similarly, in Bihar, 4.6 million, and in Maharashtra and Madhya Pradesh, 3.1 million and 2.7 million people, respectively, have joined the ranks of the poor as a result of OOP expenditure on health care (Table 4). These are also the states with the largest poverty deepening, with average consumption shortfalls of over Rs. 3 per capita per month, the highest being in Uttar Pradesh at almost Rs. 6 per capita per month. Among the low- and middle-income states, Assam, Jammu and Kashmir, and Himachal Pradesh have the lowest numbers of people moving below the poverty line and have the smallest impact in terms of poverty deepening.

The rural–urban breakdown of the poverty increase in different states provides an interesting insight. In most of the poorer states, such as Assam, Orissa, Uttar Pradesh, Bihar, Jammu and Kashmir and West Bengal, rural areas account for 87% of the total increase in poverty. The proportion is as high as 90% in Assam, Bihar and Orissa. In comparison, in

Table 4 Poverty headcount (number of persons in 1000s) after accounting for OOP payments in major Indian states and by rural and urban areas, 1999–2000

	Rural (1000 persons)	Urban (1000 persons)	Combined (1000 persons)
Uttar Pradesh	8687.4	1380.4	10 067.8
Bihar	4237.6	394.3	4631.9
Maharashtra	2099.7	959.1	3058.8
Madhya Pradesh	2087.2	634.0	2721.2
West Bengal	2040.8	347.7	2388.6
Andhra Pradesh	1137.2	492.4	1629.5
Orissa	1349.6	137.0	1486.7
Tamil Nadu	1059.6	230.0	1370.8
Rajasthan	1030.4	340.3	1289.6
Karnataka	937.9	342.7	1280.6
Gujarat	647.3	420.6	1067.8
Kerala	564.1	244.3	808.3
Punjab	318.2	155.7	473.9
Assam	454.4	9.8	464.2
Haryana	307.5	121.8	429.3
Himachal Pradesh	66.3	4.8	71.0
Jammu & Kashmir	49.9	7.5	57.4
All India	25 528.7	6992.6	32 519.9

Notes: States are arranged in descending order of total number of persons going below poverty line.

Data for Bihar, Madhya Pradesh and Uttar Pradesh relate to erstwhile states before their bifurcation.

the four richest states—Gujarat, Haryana, Maharashtra and Punjab—the proportion is only 67%. This clearly shows that OOP payments have a greater impact on poverty levels in rural areas of poorer states. In contrast, the urban poor are affected more by OOP payments, in relative terms, in richer states than in poorer states. In absolute terms, Maharashtra ranks second in terms of the increase in number of urban poor because of OOP expenditures, following closely behind Uttar Pradesh.

Poverty differentials among states in terms of the OOP payment share and increase in poverty headcount show three distinct categories: (1) high OOP payment share and high poverty increase (Uttar Pradesh, Maharashtra and Madhya Pradesh), (2) low OOP payment share but high poverty increase (Bihar, Orissa and Rajasthan), and (3) high OOP payment share but low poverty increase (Kerala, Punjab and Haryana). Underlying economic and human development factors in these states can explain the variations in poverty increase due to OOP payments.

Discussion

Before discussing the main findings, we will explain the choice of CES data instead of data from the NSSO Health Survey (HS) for estimates related to OOP expenditures and impoverishment in India. Reporting of health expenditures in the Health Survey is based on self-reporting of illness of family members, while in the CES it is based on recall of expenditure on treatment. Recall periods in both the surveys are 'last one year' for

Table 5 Comparison of 1995–96 NSS Health Survey and 1999–2000 Consumer Expenditure Survey for OOP payments

NSSO survey	Rural	Urban	Combined
Households reporting OOP (%)			
1995–96 HS	24.87 (0.162)	24.12 (0.192)	24.61 (0.124)
1999–2000 CES	70.21 (0.172)	69.87 (0.209)	70.07 (0.133)
Total OOP as a share of total household expenditure (%)			
1995–96 HS	6.83 (0.032)	5.78 (0.039)	6.47 (0.025)
1999–2000 CES	6.09 (0.037)	5.09 (0.042)	5.72 (0.028)

Note: Figures in parentheses are Standard Errors.

hospitalizations (i.e. inpatient), but they differ for outpatient care, being ‘last 15 days’ in the Health Survey and ‘last 30 days’ in the CES. With the longer recall period for outpatients in the CES, a larger proportion of households reported OOP expenditure in the 1999–2000 CES compared with the 1995–96 Health Survey (Table 5). Although the sampling error of both the proportion of households reporting OOP and the proportion of OOP to total household expenditure is marginally higher in the CES than in the Health Survey, the substantially higher proportion of households reporting OOP in the CES led us to use this for poverty impact calculations.

The CES captures OOP payment as a part of total household consumption expenditure, whereas the Health Survey concentrates more on measuring health expenditures exclusively for those households who report any ailment and/or hospitalization of family members. Since the Health Survey reports only about 25% of households experiencing illness and/or hospitalizations, only that proportion reports expenditure on health care. Further, all households that report OOP expenditures only when they have illness/hospitalisation, report a significantly higher fraction of their total household expenditure as OOP expenditure. This is further accentuated by the shorter recall period and lower total household consumption expenditure reported in the Health Survey.¹² In the CES, in contrast, approximately 70% of households report expenditure on health care.

The large difference in households reporting health expenditures in these two surveys could be due to exclusion of households incurring expenditures on self-medication, or those incurring expenditures on payments to informal providers, because of the manner in which questions on health expenditures are posed in the Health Survey. It could also be due to differences in recall for expenditures vs. ailments. In any case, this large difference cannot be ignored, as using the Health Survey leads to relatively smaller estimates of the proportion of households making OOP payments and of the increase in poverty headcount because of them. For example, the use of Health Survey data in Peters *et al.* (2002, p. 216) led them to estimate a 2.2% increase in poverty headcount because of OOP expenditure. Our estimates are approximately 1% higher at 3.2%. Part of this difference in poverty headcount may also be explained by a real increase in poverty between the two referred periods, but methodological differences highlighted above cannot be discounted. The actual magnitude of increase in poverty after discounting for OOP

expenditure can be estimated only by comparing two or more similar rounds of CES surveys.

Further, the Health Survey does not separately record drug expenditure, particularly in respect of institutional or hospital care. This is one of the most important reasons why most of the earlier literature concludes that hospitalization accounts for the largest outlay of both public and private resources in India and is the largest cause of catastrophic payments (Peters *et al.* 2002; Roy and Hill 2007). Based on the CES data, where expenditure on drugs and medicines can be separated for institutional as well as non-institutional health care, our findings show that expenditure on drugs is the largest component of OOP payments, both for institutional and for non-institutional health care.

In the CES, the proportion of OOP payments spent on drugs for non-institutional care may be slightly overestimated as the NSSO instructions to enumerators mention that: ‘In the rural areas, doctors charge a consolidated amount for consultation as well as providing medicines. In such a case, the total amount will be recorded against item 420 (medicine)’ (Government of India 2001, p. D-26). However, this problem is associated only with outpatient care in rural areas, where it is common practice for doctors to provide drugs and to charge for them with their consultation fee. In rural areas, the share of drug expenditure in total OOP payments is 70% in the top quintile compared with 86% in the lowest quintile. Since the level of amalgamation (of doctors’ fees and drug charges) may be considered to be lowest in the top population quintile, the lowest estimate of the share of drugs in OOP payments may be taken as 70%, rather than 77% as shown in the CES data. In urban areas also the combined share of drugs expenditure in total OOP payments is 70%.

The estimate that 70% of OOP expenditure is spent on drugs implies a total annual expenditure on drugs by households of Rs. 230 billion (US\$5.3 billion). This figure is approximately 14% higher than the total retail market value of drugs from all pharmaceutical companies in India (IDMA 2004). One reason for this difference could be the purchase of traditional (*Ayurvedic*, homeopathic, *Unani*, *Siddha*) and other drugs by households, which are not accounted for in the IDMA data. Hence, if we propose an average of 65–70% as the share of medicines in total OOP payments, it may not be far from the truth. Further research is needed to separate drugs expenditures from consultation fees and correctly estimate the actual expenditures on drugs from households’ OOP expenditures, including those on traditional Indian systems of medicine.

There is enough evidence from NSS data to infer that poor people spend the largest proportion of OOP expenditure on the purchase of drugs and least on inpatient treatment. One reason for this may be the irrational use of drugs, by both prescribers and users. Further, due to poor access to formal health care services, most of the poor use informal health services in large quantities and thereby spend still higher quantities on purchase of drugs and self-medication compared with those in wealthier quintiles. Hence, it is argued that expenditure on drugs is one of the major causes of impoverishment in India.

In India, OOP health expenditure is relatively high as a share of total household resources in general and total health expenditure in particular, compared not only with developed countries but also with other low-income countries.¹³ The increasing share of OOP health care payments in households' total as well as non-food expenditure is in accordance with the literature on health being a 'normal' good (McGuire *et al.* 1988; Gertler and Gaag 1990). In the top consumption expenditure quintile, purchase of a greater quantity coupled with better access to health services pushes OOP expenditure up. People in middle and higher expenditure quintiles in rural areas may be better off because of being able to purchase better care than their poorer counterparts, but they are worse off than their urban counterparts as they have to spend a higher proportion of their consumption expenditure on OOP payments (Table 1). This could also be due to households incurring more expenses on travel and other related expenditures to access facilities in urban areas.

The results for state-level differentials computed in this paper are very similar to those found in other studies (Mahal *et al.* 2001; Peters *et al.* 2002, 2003; NCMH 2005; Government of India 2005). Public spending on health is generally very low. Per capita private spending on health in Kerala, Haryana and Punjab is four times higher than that in Rajasthan and three times that in Bihar. One reason for this is the level of health transition in different states. According to Peters *et al.* (2003), Kerala is in the 'late transition' stage and Uttar Pradesh the 'early transition' stage. OOP expenditure in Kerala is high because of higher expenditure on institutional care and on lifestyle diseases such as heart conditions. Poorer states such as Assam, Bihar, Jammu and Kashmir, West Bengal, Rajasthan, etc., have a relatively low share of OOP expenditure because they are in the 'early' to 'mid' transition stage, when people spend less on health care services on account of low incomes, limited access to health care, lack of awareness (poor literacy rates) and poor infrastructure (in terms of number of facilities, availability of medicines and number of health workers). This coupled with low public spending makes the situation particularly severe.

The lower share of OOP expenditure in Karnataka, Gujarat and Tamil Nadu needs a special mention. These are middle-income states in the 'mid' to 'late' transition stages. One reason for their low OOP expenditure may be to do with other sources of financing, such as higher government expenditures and better risk-pooling systems through insurance, or high expenditure by non-governmental agencies. It has been shown in Gujarat that community-based health insurance schemes help to protect poor households against uncertain risks of

medical expenses (Ranson 2002). Gujarat, Karnataka and Tamil Nadu are known for the good performance of NGOs, particularly regarding midday meal schemes, immunization of children and other health awareness programmes.

The poverty estimates based on 1999–2000 CES data show that 3.2% of the total population in India plunged into poverty because of OOP expenditure, compared with 2.2% estimated by Peters *et al.* (2002) based on the 1995–96 Health Survey. While the official poverty line, used as a yardstick to measure poverty headcount, has been widely observed as a narrow interpretation of poverty, we use this mainly to show the comparative level of poverty headcount before and after OOP payments. As mentioned above, the lower estimates in Peters *et al.* (2002) may be due to a real increase in poverty between two time periods, or to a large number of households purchasing drugs and services without reporting illness and not being counted in the estimates by Peters *et al.* As indicated earlier, it is noteworthy that sampling errors of the two surveys are only marginally different (see Table 5).

Rural areas and poor states experience a higher increase in the poverty headcount through OOP expenditure mainly because a large proportion of their population is concentrated around the poverty line, and hence even a small amount of OOP expenditure will push many households below the poverty line. In contrast, in urban areas and richer states, where more people have monthly per capita expenditure well above the poverty line, the same level of OOP payment will not cause the same level of impoverishment.

A high share of OOP payments would normally imply a higher increase in poverty headcount, as in the case of Uttar Pradesh and Maharashtra, but the states of Bihar and Orissa had a high increase in poverty despite a low OOP payment share. The states of Bihar, Madhya Pradesh, Orissa and Uttar Pradesh are characterized by mass poverty. Taken together they constitute more than 58% of the total increase in poverty because of OOP expenditure. The level of development in Punjab, Haryana and Kerala explains their high OOP share but low poverty increase. In these three states, which have some of the lowest percentages below or just above the poverty line, even high OOP payments do not generally push people below the poverty line. Further probing is required, however, to discover what proportion of the hidden poor uses borrowing, remittances, sale of assets and past savings to finance their compulsory health care needs, which, in turn, might answer the question of the cumulative poverty impact of OOP expenditure in subsequent years. Mahal (2006) also argues that convincing evidence on long-term or chronic poverty will come only from longitudinal analysis and not from cross-sectional analysis as has been done in this study.

Conclusions and recommendations

In India, an average of 4.8% of total household consumption expenditure is spent on OOP health care payments. Poor quintiles spend a relatively lower proportion of their consumption expenditure on OOP payments than rich quintiles, in both rural and urban areas. Middle and wealthier expenditure quintiles in rural areas bear a greater burden in comparison with their urban counterparts. The OOP payment

shares were generally found to be positively correlated to per capita state domestic product. In general, poor states have low OOP shares of consumption expenditure because of low incomes, limited access to health care, lack of awareness and poor infrastructure therein. Conversely, middle and higher income states generally have high OOP expenditure, mainly on account of better health care seeking behaviour and provider choice as shown by larger expenditures on institutional care. Sometimes, governmental and/or non-governmental interventions may reverse the situation, as in the case of Gujarat and Tamil Nadu. More often, very poor government facilities and greater dependence on private facilities in nearby towns leads to a high OOP payment share, as is probably the case for Uttar Pradesh. Epidemiological changes such as lifestyle diseases and greater utilization of institutional care may also lead to high OOP payments, as in case of Kerala.

Of the 4.8% OOP share of total consumption expenditure, about 65–70% is spent on drugs and only 30–35% (urban/rural variations) is for inpatient and outpatient care. In rural areas and poorer states, the average share of expenditure on inpatient and outpatient care is lower, but expenditure on medicines is higher. There is a need not only to improve the availability of services in rural areas and in poor states, but also for a policy to rationalize high drug expenditure in these areas. Our research also suggests improving survey designs for estimating OOP expenditure, and expenditure on its components, for poverty estimations.

OOP expenditures have a striking impact on increasing the poverty ratios in the country. Over 32 million persons fall below the poverty line in a single reference year. The increase in the number of poor as a result of OOP expenditure was higher in rural areas (3.5%) than in urban areas (2.5%). Also the intensity of poverty in terms of poverty deepening when standardized by poverty lines was higher in rural areas. OOP payments, in addition to pushing a large number of people below the poverty line, also severely affect the living status of many households already below the poverty line. In terms of the poverty gap, those in urban areas below the poverty line face a larger average consumption shortfall than those in rural areas.

The poverty impact of health payments is greater in the poorer states, especially in rural areas. Targeted policies in just five poor states to reduce OOP expenditure could help to prevent almost 60% of the poverty headcount from OOP payments. In the five richest states, targeting is required among the urban poor to enable households to avoid slipping below the poverty line and also to prevent those already below the poverty line from falling deeper into poverty. This would be an important contribution to achieving the first Millennium Development Goal (of halving the population below the poverty line) to which India is a signatory.

We conclude that there is a need for: improved survey designs for impoverishment work; rationalized drug policies (including free supplies); pro-poor health financing policy focusing on financial protection not only for those close to the poverty line, but also those who are already below it in both rural and urban areas; and innovative financing mechanisms on the collection, pooling and purchasing side to reduce the intensity of poverty. One of the ways this could be

done is for policymakers to target specific areas and specific populations in certain states where the poverty impact of OOP payments is greatest.

It should be mentioned here that the Government of India, Ministry of Health and Family Welfare, started a new scheme called the National Rural Health Mission (NRHM) in April 2005 to provide quality health care to every household through its upgraded health infrastructure and provision of round-the-clock health services (Ministry of Health and Family Welfare, undated). When fully operational, it is hoped that this will reduce OOP expenditures to a bare minimum and will stop people sliding down the poverty line.

Further research needs be undertaken to identify characteristics of households that are moving below the poverty line and to analyse the impact of OOP payments on poverty as a dynamic process, that is, whether households move out of poverty by seeking medical care and who constitutes the new poor.

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Endnotes

- ¹ Of total GDP, approximately 5% is spent on health care; government spends less than 1% of GDP on financing health care, with the rest coming from the private sector, including individual and household expenditure.
- ² In OECD countries, the average OOP share is even lower at 15 to 20% (based on WHO National Health Accounts data, WHO 2006).
- ³ Two lines of absolute poverty that have been developed and used by the World Bank are \$1.08 and \$2.15 per capita per day at 1993 purchasing power parities (Ravallion 1998; Chen and Ravallion 2001). The lower of these is the median of the 10 lowest poverty lines operational in a sample of low-income countries (Ravallion *et al.* 1991). It represents a very low living standard that is often referred to as 'extreme poverty' (Chen and Ravallion 2004).
- ⁴ The NSSO is a premier institution of the Government of India under the Ministry of Statistics and Programme Implementation, which has been collecting household data on a regular basis since 1950.
- ⁵ The large CES (also known as the full round) is conducted by the NSSO after an interval of approximately 5 years. The previous large samples are the 50th round (1993–94), 47th round (1987–88), 43rd round (1983), 38th round (1977–78) and 32nd round (1972–73). In-between these quinquennial rounds, annual rounds (also known as the thin sample) are conducted with a smaller sample. The CES 55th round for 1999–2000 was the latest available large sample at the time the study was completed.
- ⁶ There are many reference groups, rural and urban, in different states. Each of these has a different official poverty line,

commonly known as state-specific rural and urban poverty lines, which have been considered for this study.

- ⁷The concentration index measures the underlying inequity in OOP payments in relation to the ATP. The formula used for calculating the concentration index (C) is: $C = [2/\alpha] \text{cov}(y_i, R_i)$, where y is the OOP variable, α is mean OOP, and R_i is the i th household's fractional rank in ATP distribution (i.e. the household's rank in the consumption expenditure distribution).
- ⁸In order to correct for likely autocorrelation and heteroscedasticity in the regressor (fractional rank of the ATP variable), the standard error has been calculated using the Newey-West variance-covariance matrix (Kakwani *et al.* 1997).
- ⁹The size of the Indian pharmaceutical industry, both bulk drugs and formulations, was estimated at Rs. 354.7 billion in 2003–04 (US\$7.7 billion) (IDMA 2004).
- ¹⁰The pre-payment headcount is the same as the official estimate of the poverty headcount for India. For the state-wise and all-India poverty estimates see Planning Commission (2002).
- ¹¹Private expenditures include expenditures of firms, non-government organizations and households (Government of India 2005: Table 1.3). OOP expenditures form over 90% of private expenditures.
- ¹²In all NSSO surveys other than the CES (but including the Health Survey), an abridged version of the consumption expenditure schedule is canvassed. This usually provides lower estimates of total household consumption expenditure as compared with that found in the quinquennial CES rounds (see also NSSO 1998, p. 12; NSSO 2006, p. 21).
- ¹³OOP payments constitute 80% of total health expenditure in India, compared with an average of 65% in low-income countries in 2000 (WHO 2006, and the WHO National Health Accounts website: <http://www.who.int/nha>).

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