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Out-of-pocket Expenditures and Poverty: Estimates From NSS 61st Round

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Introduction: Out-of-pocket payment and poverty

Health care finance in developing and low income countries is still predominantly based on out-of-pocket (OOP) payments, and the lack of prepayment mechanisms like insurance. In the absence of insurance, an illness not only reduces welfare directly, it also increases the risk of impoverishment due to high treatment expenditures. It is now widely acknowledged that health care expenditures can drive individuals and households into poverty. The literature around out-of-pocket payments and its impact on the economic status of households has grown tremendously over the past.

Catastrophic payments for health are defined in relation to the household resources, most often proxied by aggregate consumption. A simple ratio of health expenditure to consumption expenditure can be used to estimate how high the health spending of households is in comparison to their total consumption. A threshold of 10 percent is commonly used with the rationale that above this the household may be forced to sacrifice other basic needs, sell productive assets, incur debt or become impoverished (Pradhan and Prescott 2002, Ranson 2002, Wagstaff and van Doorslaer 2003, Russell 2004).

A seminal work on catastrophic health expenditures in 59 countries published by Lancet (Xu et al (2003) indicated that there was wide variation in the proportion of households facing catastrophic payments from out-of-pocket health expenses. The authors identified three key preconditions for catastrophic payments as the availability of health services requiring payment, low capacity to pay, and the lack of prepayment or health insurance. The authors concluded that individual, particularly in poor households, can be protected from catastrophic health expenditures by reducing a health system's reliance on out-of-pocket payments and providing more financial risk protection.

Another study from Burkina Faso (Su et al 2006) identified the key determinants of catastrophic health expenditure as economic status, household health care utilization especially for modern medical care, illness episodes in an adult household member and presence of a member with chronic illness.

A given overall share of out-of-pocket financing may represent relatively little financial risk to households if it is low and is distributed more or less proportionally to capacity to pay. However, that is not the case and a multi-country analysis (Musgrove and Zeramdini 2001) indicates that at low incomes, the out-of-pocket share is high on average, and extremely variable, from about 20 to 80% of all health spending. With increasing income, not only does the average share fall sharply, but the range narrows.

Several studies of Indian villages to determine why households descent into poverty (Krishna 2004, Krishna et al 2005, Krishna 2006) find that in a majority of cases of decline into poverty, three principal factors are at work: health expenses, high-interest private debt, and social and customary expenses. Irrespective of distance to health care facility, health care expenses figured prominently in more than half of all cases of decline into poverty.

The discussion, debates and evidence around the effect of OOP payments on health and poverty outcomes was so intense that in 2005 the Member States of WHO adopted a resolution encouraging countries to develop health financing systems aimed at providing universal coverage. Universal coverage was seen as a system designed to obtain access for all to appropriate promotive, preventive, curative and rehabilitative services at an affordable cost. Insufficient health coverage, poor health services, low public health spending all go to determine the level and extent of OOP in countries.

The poverty-inducing effect of OOP expenditures has also led to a significant literature on methodological issues around estimation of poverty that takes into account health expenditure. This paper reviews the existing methodology, proposes a methodology for India, presents some preliminary estimates using data from the 61st round of the NSS, and also discusses the concerns that remain in measurement and estimation of both health expenditures and poverty.

Poverty and out-of-pocket health expenditure: standard methodology

It is now commonly acknowledged that standard poverty measures do not adequately reflect the health needs of individuals. A study in 11 countries of Asia estimated that 78 million people in Asia are not currently counted as poor despite the fact their per capita household expenditure net of health expenditure falls below the extreme poverty threshold of $1 per day (Van Doorslaer 2006). The two key questions that need to be addressed in this context are the following:

- How to measure poverty taking into account out-of-pocket (OOP) health expenditures?
- How does the head count ration or other poverty measures change when OOP is taken into account?

Based on earlier papers and research, an expert team led by the World Bank Institute has come out with operational guidelines entitled "Analyzing Health Equity Using Household Survey Data" brought by the World Bank (O'Donnell et al 2008). It gives in details the options available to practitioners and researchers for adjusting measures of poverty to take into account expenditure on health care. Subsequently, many researchers have used the more standard methodology described in detail below. The estimates in this note are based on this methodology as well.

Simply put, poverty needs to be measured taking into account OOP spending, since health spending is also now viewed as an essential expenditure that enhances welfare like food and other necessities. The problem is that health spending can sometimes be a function of income, and may not always be essential. Thus, excluding all health spending from total expenditure to assess poverty can result in overestimation of poverty. On the other hand, not including any health expenditure will underestimate poverty, especially if the non-discretionary part is quite significant, as it often is in developing countries. As contended by O'Donnell and others, there are two conditions under which the difference between poverty estimates derived from household resources gross and net of OOP payments may approximate the effect of health expenditure on poverty. These are when:

(a) OOP payments are completely non-discretionary, and (b) total households resources are fixed.

In real life, neither of these two conditions is met; health expenditures are often a function of income, especially at the upper tail of the income distribution. Also, households augment their resources in a variety of ways to meet unexpected expenditures.

The other question is: should poverty lines be adjusted to reflect inclusion of essential health expenditures? The adjustments that have to be made to poverty estimates in the presence of significant health expenditure would depend to a certain extent on how the poverty line is being calculated. If the poverty line is calculated based on subsistence needs only, i.e. an absolute poverty line, then there may be no justification of adjusting this line taking into account health expenditures. If on the other hand, a relative poverty line is being calculated, based on the mean or median household expenditure, there is certainly a justification in adjusting it based on health expenditure.

The other problem is that the health expenditures are highly stochastic across individuals and over time, and vary significantly depending on socio-economic characteristics. Thus, the concern around the representative ness of mean or median health expenditure always remains. However, it has been suggested that the poverty line may be adjusted downwards by the mean of health spending of households whose total expenditure is about the same as the poverty line (Wagstaff and van Doorslaer 2003).

Measuring health expenditure: measurement issues

A methodology is as good as the estimates it uses: measuring health expenditure is fraught with measurement errors, mostly because of the many factors that determine who spends how much and on what.

a. ***Acute vs chronic conditions***: acute illnesses and chronic illnesses need to be separated and treated differently. Whether a poverty line should take into

consideration expenditures for long-term care that are less unpredictable than acute expenditures, or should focus only on sudden expenditures due to unforeseen illnesses is a point that needs to be settled before making any calculations.

b. ***Reference period:*** while the reference period is often aligned with the type of illness (acute or chronic), it need not always be so. A 30 days or 15 days recall period versus a 365 days recall period would give very different estimates, and one has to have an operational rule about how to annualize the short recall period estimates and how to reduce the long recall period estimates to a monthly figure.

c. ***Hospitalization vs out-patient care (OPD):*** Hospitalization is generally an unanticipated event, and cannot be attributed to everyone in the sample. Thus, treatment of expenditure from hospitalization needs to be handled with caution. OPD expenditure on the other hand is probably the most general of aggregates and safest to use in calculations like poverty estimates. However, hospitalizations often have a more severe impact on poverty than OPD, and therefore, need to be taken into account under suitable assumptions.

d. ***Items of health expenditure:*** health expenditure can be broadly divided into the following items: drugs & medicines, consultations, diagnostics, hospital stay & related items, medical appliances and devices used, and other miscellaneous expenditures. The relative weight of each of these items in the total health expenditure may be necessary to calculate before making a decision on whether or not all these items should be treated as essential.

e. ***General vs health-specific surveys:*** finally, it must be noted that aggregates generated from general surveys of consumption expenditure are often quite different from aggregates generated from detailed itemized questions of specific surveys on health.

To better understand the variability on estimates for these various categories, we take data from the 60th and 61st NSS rounds; while the 61st round is a standard Consumer Expenditure Survey (CES), the 60th round is for health. Also, the 60th round was for the year 2004, whereas the 61st round is for 2004-2005. Since the time periods are quite

close, these two surveys are used to demonstrate why caution and care need to be taken to calculate health aggregates that will then be used to re-estimate poverty figures.

Table 1: Health aggregates obtained from NSS 60th and 61st round

Variable	Reference period	60th NSS January – June 2004	61st NSS July 2004-June 2005
% reporting hospitalization	365 days	2.4%	9% – Rural 10% - Urban
% reporting hospitalization	30 days	NA	1.4% - Rural 1.5% -Urban
Per capita hospitalization expenses, over all who reported hospitalization	365 days	Rs. 6332- Rural Rs. 9806 – Urban	Rs. 804 - Rural Rs. 958 – Urban
Per capita hospitalization expenses, over entire sample	365 days	Rs. 151 – Rural Rs 303 – Urban	Rs 120 – Rural Rs 204 – Urban
Per capita hospitalization, over entire sample	30 days	NA	Rs. 11 – Rural Rs. 14 – Urban
% reported OPD treatment	15 days	89% - Urban 82% - Urban	NA
% reporting OPD treatment	30 days	NA	61% -Rural 63% - Urban
OPD expenses over those who reported OPD treatment	15 days	Rs 322 – Rural Rs 385 – Urban	NA
OPD expenses, over entire sample	15 days	Rs. 21 – Rural Rs. 31 – Urban	NA
OPD expenses	30 days	NA	Rs. 27 – Rural Rs. 42 - Urban
Share of drugs in OPD expenses	15 days	63%	-
Share of drugs in OPD	30 days	NA	82%
Share of drugs in hospitalization	365 days	25%	41%

A quick glance at the table indicates that utmost caution that needs to be exercised in calculating health expenditures. For example, hospitalization differs significantly depending on the reference period and depending on the rate of hospitalization, the average amount spent on hospital expenses will also be very different. Percent reporting OPD expenses were also quite different in the two rounds, though the rounds are only

about a year apart. Similarly, share of items of expenditures also vary significantly across the two rounds.

Poverty estimates are based on consumer expenditure surveys. Therefore, the first criterion of selecting a health expenditure aggregate has to be that it must come from the same survey. While the 60th health round also has consumption expenditure, it is more like a rapid survey of consumption expenditure. In other words, 60th round has detailed health and brief consumption expenditure, while the 61st round has brief health and detailed consumption expenditure. Since poverty calculations need detailed consumption expenditure, the health aggregates must perforce come from the same survey. In principle it is possible to adjust the health expenditure figures by looking at the patterns from the detailed health survey, which can be done in subsequent analyses.

Poverty calculations are done based on Rupees per capita per month. Therefore, any health expenditure should be as close to a monthly average expenditure figure per person. The difficulty lies here: since not the entire sample is going to be sick, the average expenditure over all those who reported sick is going to be very high, and cannot be taken as the norm for the entire population. On the other hand, using the entire survey population to arrive at a per person figure may underestimate the total expenditure an average household undertakes for the entire year on health.

Ideally, total health expenditures reported over the entire year and not for the past 15 or 30 days should be used to make any calculations regarding health expenditure. However, since the Planning Commission poverty figures are based on the Uniform Recall Period (URP) of 30 days, the health expenditures will have to be comparable and based on URP too.

Table 2 presents the 3 main aggregates and their values calculated based on the 61st round of NSS. Interestingly, the medical institutional expenditures for both the recall periods give almost the same estimate.

Table 2: Medical expenditure, NSS 61st round	
Health aggregates NSS 61st round	Per capita estimates in Rupees – all India
Medical institutional expenditure in the last 365 days	143
Medical institutional expenditure in the last 30 days	12
Medical non-institutional expenditure in the last 30 days	35

Methodology for health-adjusted poverty estimates

The most common methodology for adjusting poverty lines to take into account health expenditure is one offered by Wagstaff and Doorslaer (2003) and subsequently compiled by the World Bank Institute as mentioned above. This methodology is presented in detail below:

Suppose that the poverty head count is calculated gross of out-of-pocket (OOP) payments. In other words, if household expenditures include health payments, the head count ratio H^{gross} can be written in the following manner:

$H^{gross} = \frac{\sum_{i=1}^{N} s_i p_i^{gross}}{\sum_{i=1}^{N} s_i}$, where $p_i^{gross} = 1$ *IF* $x_i < PL$ and is 0 otherwise, where s_i is the household size. N is the number of households in the sample, and PL is the poverty line.

The net of health payments head count is obtained by replacing p_i^{gross} with $p_i^{net} = 1$ *if* $(x_i - T_i) < PL$ (and 0 otherwise), where T_i is health expenditure.

The poverty gap gross of health payments is $g_i^{gross} = p_i^{gross}(PL - x_i)$ and the mean of this gap is $G^{gross} = \frac{\sum_{i=1}^{N} s_i g_i^{gross}}{\sum_{i=1}^{N} s_i}$. The net of health payment poverty gap can be obtained by using

$g_i^{net} = p_i^{net}(PL - (x_i - T_i))$ in the second equation, where T_i is the out of pocket expenditure.

One can also normalize the poverty gap on the poverty line such that $NG^{gross} = \frac{G^{gross}}{PL}$, where the mean of this $MPG^{gross} = \frac{G^{gross}}{H^{gross}}$, gives the intensity of poverty. The net of payments normalized gap can be obtained similarly.

It can be argued that the poverty line itself should also be adjusted downwards if poverty is to be estimated *net* of OOP payments. This can be done in cases where the poverty line is inclusive of health needs. Absolute poverty lines do not require such adjustments. However, for poverty lines that are relative and higher than the absolute poverty lines, there may be some reason to adjust the line downwards, especially if the assumption is that a majority of individuals get additional funds to cover their health needs. One option suggested by Wagstaff and van Doorslaer (2003) is to subtract from the poverty line the average health spending of households with total expenditure in the region of the poverty line.

For India, the poverty lines are estimated based on subsistence nutritional requirements, and also there very little additional resources for health for the majority of the population (only 10% of the population have any form of health coverage). Thus, no adjustment is required to the poverty lines while calculating poverty net of OOP payments.

This paper essentially uses the same methodology – without adjustment to the poverty line - to estimate the health-expenditure adjusted poverty estimates using the Consumer Expenditure Survey data of the 61st round of NSS survey. An earlier paper (Garg and Karan 2008) also uses the same methodology to estimate the effect of out-of-pocket health expenditures on poverty, using the Consumer Expenditure Survey (CES) of NSS in its 55th round. These earlier results are presented here as well for the sake of comparison.

Results

The analysis uses the poverty line calculations arrived at by the Planning Commission to arrive at revised poverty figures. The results are presented in Table 3. While the methodology of net consumption expenditure is adopted, the poverty line is not revised. One reason for doing that comes from the 60th health round of the NSS, which indicates that less than 1 percent of those who reported an ailment in the past 15 days, and less than 0.5 percent of those who reported hospitalization in the last 365 days had any sort of reimbursement for their treatment.

Table 3: Estimates of poverty with and without health expenditure adjustments

Variable	Rural	Urban
a. Head count ratio	28.3%	25.6%
b. Poverty gap (Rs)	20.2	32.7
c. Health-expenditure adjusted head count ratio	31.9%	28.5%
d. Poverty gap, health-expenditure adjusted	23.7	37.6
e. Percentage increase in poverty (c-a)	3.6	2.9
f. Increase in poverty gap (d-b)	3.5	4.9

As can be seen from the table, poverty increases by 3.6% and 2.9% for rural and urban areas respectively when OOP spending is adjusted for. The poverty gap show how much would have to be transferred to the poor to bring their expenditure up to the poverty line, and the table indicates that this amounts increases for both rural and urban areas, and an additional Rs 3.5 and Rs. 4.9 per capita per month is the increase in the poverty gap because of OOP payments. Clearly, these figures do not reflect how many poor individuals are made poorer by OOP, which is also an important dimension of poverty.

Comparison with estimates from NSS 55th round (Garg & Karan 2008)

Based on the 55th round of CES data of the NSS, Garg and Karan use the same methodology to arrive at poverty estimates. These figures are presented below in Table 4 along with the current estimates from Table 3.

Table 4: Estimates from 55th and 61st rounds: a comparison				
	1999-2000 (Garg & Karan)		2004-2005 (from Table 3)	
Variable	Rural	Urban	Rural	Urban
a. Head count ratio	26.8	23.5	28.3	25.6
b. Poverty gap (Rs)	17.1	23.4	20.2	32.7
c. Health-expenditure adjusted head count ratio	30.3	26.1	31.9	28.5
d. Poverty gap, health-expenditure adjusted	19.9	26.6	23.7	37.6
e. Percentage increase in poverty (c-a)	3.5	2.5	3.6	2.9
f. Increase in poverty gap (d-b)	2.8	3.2	3.5	4.9

Since both sets of estimates use the same methodology, these are comparable. The table shows that both rural and urban poverty have increased between the two rounds, as have the health expenditure adjusted poverty. Interestingly, the gap between rural and urban poverty is more when health expenditures are taken into account. Rural poverty increases slightly more than urban poverty in both the periods, when health expenditures are adjusted for. Further, there was a 3.3% difference between urban and rural poverty in the 55th round, which increased to 4.2%. The impact on poverty gaps for both rural and urban areas in the latter period is somewhat more pronounced than its impact on poverty head count ratio. These results indicate that OOP spending is more poverty-inducing in the rural than the urban areas, and its impact on poverty has increased over the years.

Inter-state variation in health-expenditure adjusted poverty

Table 5 below presents the poverty head count ratio for the states. Since poverty ratio of Assam is used for Sikkim, Arunachal Pradesh,Meghalaya, Mizoram,Manipur,Nagaland and Tripura, only result for Assam is presented here. Similarly, the poverty ratios of Tamil Nadu is used for Pondicherry and A & N Island, that of Goa and Kerala are used

for Daman & Diu and Lakshadweep respectively, and that of Punjab is used for Chandigarh. Thus, the results are only presented for the primary states here.

Table 5: State-wise estimates of Head Count Ratio with & without adjustment for heath expenditure

State	Rural			Urban		
	No adjustment	Adjusted for health expenditure	% increase	No adjustment	Adjusted for health expenditure	% increase
Andhra Pradesh	10.5	11.6	1.1	27.4	30.7	3.3
Assam	22.1	23.4	1.3	3.6	3.8	0.2
Bihar	42.6	45.3	2.7	36.1	37.7	1.6
Chattisgarh	40.8	46.3	**5.6**	42.2	45.0	2.8
Delhi	6.9	6.9	0	16.3	16.8	0.5
Goa	5.6	5.6	0	19.7	22.9	3.2
Gujarat	18.9	22.3	3.4	13.3	14.7	1.4
Haryana	13.2	16.8	3.6	14.5	15.4	0.9
Himachal Pradesh	10.5	13.2	2.7	3.2	3.7	0.5
Jammu & Kashmir	4.3	5.4	1.1	7.4	8.1	0.7
Jharkhand	46.2	49.9	3.7	20.2	21.8	1.6
Karnataka	20.7	24.1	3.4	32.6	34.8	2.2
Kerala	13.2	17.4	**4.2**	20.0	23.8	**3.8**
Madhya Pradesh	36.8	42.2	**5.4**	42.7	46.1	**3.4**
Maharashtra	29.6	33.6	**4.0**	32.1	35.0	2.9
Orissa	46.9	50.9	**4.0**	44.7	46.6	1.9
Punjab	9.0	11.6	2.6	6.3	8.1	1.8
Rajasthan	18.3	21.8	3.5	32.3	36.9	**4.6**
Tamil Nadu	23.0	25.0	2.0	22.4	25.2	2.8
Uttar Pradesh	33.3	39.1	**5.8**	30.1	34.7	**4.6**
Uttarakhand	40.6	44.4	3.8	36.5	37.7	1.2
West Bengal	28.4	32.9	**4.5**	13.5	15.4	1.9
Dadra & N. Haveli	39.6	40.1	0.5	19.1	19.1	0

There are two points to note from this table: the first is that as expected, the increase in poverty when one takes into account health expenditure is almost always higher in rural than urban areas with the exception of Andhra Pradesh and Rajasthan, where urban adjusted poverty increased more than rural adjusted poverty. Thus, rural health expenditures are more poverty-inducing than urban health expenditures. Secondly, some states have significant increases in poverty, whereas for some others health expenditure does not make too much of a difference to the poverty estimates.

For example, for Uttar Pradesh and Madhya Pradesh the increase in rural poverty is 5.8 and 5.4 percent respectively. For Uttar Pradesh the increase is not as high for urban areas, but for Madhya Pradesh urban poverty also increases by 4.6 percent, one of the highest among all the states.

Interestingly, Kerala has high increases in both rural and urban poverty when health expenditures are adjusted for. Overall, rural poverty increases the most for the EAG states with the exception of Maharashtra, West Bengal and Kerala. The picture is slightly more varied for increases in urban poverty.

These results are somewhat consistent with earlier findings from Garg and Karan: they also concluded that UP showed high increase in poverty, but whereas Bihar showed very high increase in their calculations, Bihar has a relatively more modest impact on poverty due to OOP spending.

Health expenditure in total consumption expenditure

Overall, 4.7% of total household expenditure is spent on OOP health spending. However, there is wide variation across states, with the poorer states showing much higher health spending than the other states. Table 6 presents the inter-state variations in proportion spent on health, by rural-urban residence to complete the picture on poverty-inducing effect of OOP spending.

The table shows very high OOP spending in states like Uttar Pradesh, Chattisgarh, Kerala, Maharashtra and West Bengal. Most of these states also end up in the basket of states that have significant increases in poverty due to OOP spending, except Rajasthan to some extent. Clearly, high proportion of OOP spending across states does not necessarily indicate high increases in poverty; however, since the overlap is very high, it indicates that in these states, the burden of high spending is probably mostly in the lower quintiles of the expenditure distribution, which in turn increases poverty in these states.

Table 6: OOP as a percentage of total expenditure			
States	Rural	Urban	Total
Andhra Pradesh	4.9	4.1	4.7
Assam	1.6	2.6	1.7
Bihar	2.8	3.0	2.8
Chattisgarh	**5.2**	**5.9**	**5.3**
Delhi	1.6	1.9	1.9
Goa	2.4	3.8	2.9
Gujarat	3.8	3.8	3.8
Haryana	5.0	4.1	4.8
Himachal Pradesh	5.1	**5.0**	**5.1**
Jammu & Kashmir	2.5	2.3	2.4
Jharkhand	3.2	4.4	3.4
Karnataka	3.4	3.3	3.3
Kerala	**7.8**	**6.6**	**7.5**
Madhya Pradesh	5.3	4.0	5.0
Maharashtra	5.5	**5.0**	**5.3**
Orissa	4.1	3.7	4.0
Punjab	**5.5**	4.1	5.1
Rajasthan	4.3	4.4	4.3
Tamil Nadu	3.8	4.0	3.9
Uttar Pradesh	**6.8**	**5.4**	**6.5**
Uttarakhand	3.8	3.0	3.6
West Bengal	5.1	**5.0**	**5.1**
Dadra & N. Haveli	1.8	2.4	1.8

Summary and conclusions

The standard methodology developed by the World Bank team for analyzing poverty induced by out-of-pocket expenses was used in this paper to estimate the likely increase in poverty. Data from the Consumer Expenditure Survey of the 61st round of the NSS was used to arrive at OOP health expenditures, which were then accounted for while estimating poverty.

The analysis showed increases in poverty by as much as 3.6 and 2.9 percent for rural and urban India respectively, if OOP health expenditures are accounted for. These estimates are higher compared to the estimated impact on poverty calculated from the 55th round of the CES of the NSS.

The state-wise picture also indicates that most states will experience significantly higher poverty if OOP is taken into account, with the EAG states being affected the most. However, states like Kerala, Maharashtra and West Bengal are also among those states that are most affected; these are also states that have high proportion of health spending.

India currently has about 10 percent of its population covered by some form of health insurance. In the absence of health insurance, the effect of high OOP expenditure will clearly impact on poverty, pushing especially those who are slightly above poverty line into poverty, and those already below poverty line, into further impoverishment.

While poverty estimates need to take into account OOP spending to make the estimates meaningful, it is also equally important to push policymakers to initiate programmes and policies to extend health coverage to a larger number of individuals. The challenge in health coverage is to be able to find a way to cover the informal and unorganized sector workers and their dependents. While many schemes have been considered and launched, the success rates have been very low, and India remains one of the countries with least health coverage for those who need it the most. Till the time such a mass extension of health coverage to take into account catastrophic expenses occurs, health will continue to be an additional factor that induces poverty, in addition to employment status and wages.

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