

Paying out-of-pocket for health care in Asia: Catastrophic and poverty impact

Eddy van Doorslaer	<i>Erasmus University, the Netherlands</i>
Owen O'Donnell	<i>University of Macedonia, Greece</i>
Ravi P. Rannan-Eliya	<i>Institute for Health Policy, Sri Lanka</i>
Aparnaa Somanathan	<i>Institute for Health Policy, Sri Lanka</i>
Shiva Raj Adhikari	<i>Nepal Health Economics Association, Nepal</i>
Baktygul Akkazieva	<i>WHO Health Policy Analysis Project, Kyrgyz Rep.</i>
Charu C. Garg	<i>Institute for Human Development, India</i>
Deni Harbianto	<i>Gadjah Mada University, Indonesia</i>
Alejandro N. Herrin	<i>University of the Philippines, The Philippines</i>
Mohammed Nazmul Huq	<i>Data International Ltd., Bangladesh</i>
Shamsia Ibragimova	<i>National Statistical Committee, Kyrgyz Republic</i>
Anup Karan	<i>Institute for Human Development, India</i>
Tae-jin Lee	<i>Hallym University, South Korea</i>
Gabriel M. Leung	<i>University of Hong Kong, Hong Kong SAR</i>
Jui-fen Rachel Lu	<i>Chang Gung University, Taiwan</i>
Chiu Wan Ng	<i>Ministry of Health, Malaysia</i>
Badri Raj Pande	<i>Nepal Health Economics Association, Nepal</i>
Rachel Racelis	<i>University of the Philippines, The Philippines</i>
Sihai Tao	<i>National Health Economics Institute, China</i>
Keith Tin	<i>University of Hong Kong, Hong Kong SAR</i>
Kanjana Tisayaticom	<i>Health Systems Research Institute, Thailand</i>
Laksono Trisnantoro	<i>Gadjah Mada University, Indonesia</i>
Chitpranee Visasvid	<i>Health Systems Research Institute, Thailand</i>
Yuxin Zhao	<i>National Health Economics Institute, China</i>

May 2005

Acknowledgements: The European Commission, INCO-DEV programme (ICA4-CT-2001-10015), funds the EQUITAP project from which this paper derives. Analysis for Taiwan funded by Taiwan Department of Health (DOH91-PL-1001 and DOH92-PL-1001) and for Hong Kong by the Health, Welfare and Food Bureau, Government of the Hong Kong Special Administrative Region.

Corresponding author: Eddy van Doorslaer, Department of Health Policy and Management, Erasmus University, Rotterdam, the Netherlands; E-mail: vandoorslaer@bmg.eur.nl

Abstract

Out-of-pocket (OOP) payments are the principal means of financing health care throughout much of Asia. We describe the magnitude and distribution of OOP payments for health care in fourteen countries and territories accounting for 81% of the Asian population. We focus on expenditures that may be considered catastrophic, in the sense that they absorb a large fraction of household resources, and on the impoverishing effect of payments. Catastrophic impact is measured by the prevalence and intensity of high shares of OOP in total spending and in non-food expenditure. Impoverishment is measured by comparing poverty headcounts and gaps before and after OOP health payments. We present the first cross-country comparisons of the impoverishing effect of OOP payments measured against the international poverty standards of \$1 and \$2 per person per day.

Bangladesh, China, India and Vietnam stand out in relying heavily on OOP financing, having a high prevalence of catastrophic payments and a large poverty impact of these payments. Sri Lanka is striking as a low-income country that manages to keep the OOP share of financing below 50% and still further because the catastrophic and poverty impact of these payments are modest. Thailand has pushed the OOP share even lower and, through a health entitlement card and now a minimal flat rate charge, has successfully limited the impact of health care payments on household living standards. At a still higher level of national income, Malaysia has been even more successful in limiting the catastrophic and impoverishing effects of OOP payments.

In most low/middle-income countries, the better-off that are more likely to spend a large fraction of total household resources on health care. This reflects the inability of the poorest of the poor to divert resources from basic needs. It also seems to reflect the protection of the poor from user charges in some countries. In China, Kyrgyz and Vietnam, where there are no exemptions of the poor from charges, the poor are as likely, or even more likely, to incur catastrophic payments. Despite the concentration of catastrophic payments on the better-off in the majority of low-income countries, OOP payments still push many Asians (further into) poverty. Seventy-eight million people in the eleven low/middle-income countries included in this study, or 2.7% of the total population, are pushed below the very low threshold of \$1 per day due to payments for health care.

Keywords: health care financing, health care payments, catastrophic health costs, poverty, Asia

1. Introduction

Out-of-pocket payments are the principal means of financing health care throughout much of Asia (O'Donnell, Van Doorslaer et al. 2005). This has consequences for the utilisation of health care and subsequently health. There are also potentially important consequences for household living standards. Welfare is reduced by the uncertainty of medical expenditures. Households may be able to borrow to cover unexpected medical bills but at the risk of being trapped in long-term debt. As a result, opportunities to escape poverty through investments in human capital may be lost. Where there is a lack of access to credit, a characteristic of less-developed economies particularly binding for the financing of investments in health, medical expenses must be covered from the current household budget and from wealth. Some households might be able to finance medical expenses from savings, by selling assets or by cutting back on expendable items of consumption. More severely economically constrained households may be forced to cut back on necessities and consequently pushed into, or further into, into poverty. Illness then presents a difficult choice between diverting a large fraction of household resources to cover the costs of treatment and forgoing treatment at the expense of health.

The threat that out-of-pocket (OOP) payments pose to household living standards is increasingly recognised as a major consideration in the financing of health care (Commission on Macroeconomics and Health 2001; Whitehead, Dahgren et al. 2001; Kawabata, Xu et al. 2002; Meesen, Zang et al. 2003; OECD and WHO 2003; World Bank 2004). The extent to which such concern is justified depends upon the unpredictability of OOP payments, their magnitude relative to household resources and their distribution in relation to that of income. We describe the magnitude and distribution of OOP payments for health care in fourteen countries and territories that account for 81% of the total population of Asia (49% of the world population). Our focus is on expenditures that are catastrophic, in the sense that they severely disrupt household living standards, and on the impoverishing effect of payments. *Catastrophic payments* have been defined as those in excess of a substantial fraction of the household budget (Berki 1986; Wyszewianski 1986; Pradhan and Prescott 2002; Wagstaff and Van

Doorslaer 2003; Russell 2004). Spending a large fraction of household resources on health care is disruptive to living standards, either in the short term as consumption of other goods and services must be sacrificed, or in the long term as assets are divested and/or savings depleted. Impoverishment is examined by estimating the number of individuals that are pushed below the poverty line once OOP expenditures on health care are subtracted from household resources. In shorthand, we refer to this as the *poverty impact* of OOP payments, although it obviously falls short of identifying the reduction in poverty that would follow from replacing OOP financing with some form of pre-payment. Nonetheless, comparing poverty headcounts and gaps before and after taking account of OOP payments gives an impression of the extent to which such payments are at the expense of basic needs.

Most previous estimates of the impact of OOP payments on living standards in developing countries have relied on data from small-scale health surveys that are not nationally representative, often being restricted to rural areas (Sauerbron, Ibrangho et al. 1995; Ensor and Pham 1996; Sauerbron, Adams et al. 1996; Pannarunothai and Mills 1997; Wilkes, Y. et al. 1998; Fabricant, Kamara et al. 1999; Ranson 2002; Segall, Tipping et al. 2002; Skarbinski, Walker et al. 2002; Russell 2004; van Damme 2004). We analyse data from nationally representative household expenditure surveys that record both OOP payments for health care and total household expenditure in detail and so offer accurate estimates of the magnitude of OOP payments relative to the household budget. We extend the existing evidence on catastrophic payments derived from nationally representative expenditure data (Pradhan and Prescott 2002; Wagstaff and Van Doorslaer 2003; Xu, Evans et al. 2003) by adding estimates for China and India, among others. In addition, we present the first cross-country comparisons of the impoverishing effect of OOP payments measured against the international poverty standards of \$1 and \$2 per person per day.

The structure of the paper is as follows. In the next section, we provide background information on the financing contribution and composition of OOP payments and on public health care charging policy in each of the fourteen study territories. In section 3, we summarise the magnitude and distribution of OOP payments relative to household budgets. The extent to which OOP payments for health care are catastrophic is examined

section 4 and the degree to which they exacerbate poverty in section 5. The interpretation, limitations and policy implications of the results are discussed in the final section.

2. Out-of-pocket financing of health care in Asia

OOP payments fund at least 30%, and often much more, of total expenditure on health (TEH) in each of the fourteen territories (Table 1). Poorer countries rely more heavily on direct payments. The OOP contribution reaches three-quarters or more of TEH in Nepal, India and Vietnam. OOP financing has been reduced in Hong Kong, Malaysia and Thailand by greater reliance on taxation and in Taiwan and South Korea through the development of universal social insurance. However, heavy use of co-payments means that one half of TEH in South Korea is still financed directly out-of-pocket.

TABLE 1

Our analysis is based on OOP payments reported in household expenditure or socio-economic surveys. Details of the surveys are given in Table A1 of the Appendix. OOP payments include fees, insurance co-payments, user charges for public care and purchases of medicines, appliances, diagnostic tests, etc. Expenditures on both Western and traditional care are included. The shares of total OOP payments that are for public sector care and the percentages of the total on inpatient, ambulatory, medicines and other types of care are given in Table 1. In some cases it is not possible to make this disaggregation since the survey asks only for total OOP payments for health care.

In Bangladesh and Sri Lanka, only a tiny fraction of OOP payments are for care delivered in the public sector. In Sri Lanka, care in the public sector is free, with the rather peculiar exception of family planning (Table 2). In Bangladesh, most primary care is free and there is only a nominal registration charge for inpatient and outpatient care in secondary facilities. There are charges for inpatient care at major public hospitals but the poor and civil servants are exempt (Table 2). In principle, medicines are free within facilities but in practice most medicines must be purchased from drug outlets. This, in addition to the widespread use of unqualified providers of modern and traditional

medicine, accounts for the low share of total OOP payments that is for public sector care in Bangladesh (Data International Ltd. 2004). Public sector charges constitute a very modest share of total OOP payments in Hong Kong, where charges are made for inpatient and outpatient care but at a very moderate level and with exemptions for the poor, civil servants and health service staff (Table 2). Malaysia is similar but with less exemptions for the poor. By contrast, payments for care received in the public sector account for around a quarter of total OOP payments in India and Indonesia and more than a third in Thailand and Vietnam and more than two-fifths in Kyrgyzstan (Table 1).¹ There are user charges for virtually all public sector medical care and medicines in Indonesia. This is also the case in Thailand but there the universal coverage reform has reduced charges to a minimal level since October 2001. Charges are levied for all public sector care in Vietnam, with the exception of outpatient care at health centres (Table 2). In India, primary care delivered at some or all facilities is free, at least in principle. The same is true in Kyrgyz and the Philippines and there is a 60% subsidy for care at health posts and primary care centres in Nepal. There are no charges for vaccinations, immunisations and family planning services in Bangladesh, China, India, Malaysia, Nepal, Taiwan and Thailand. Consultations with hospital specialists are free only in India and Kyrgyz.

Exemptions of the poor from public sector user charges and co-payments in Bangladesh, Hong Kong, Indonesia, Malaysia, Nepal, the Philippines, Taiwan, Thailand and Vietnam may reduce the impoverishing effect of such charges. But this depends upon the implementation of fee waivers. There are known problems with implementation in Bangladesh, Nepal, and the Philippines, often because shortage of medicines means that they must be paid for. In Indonesia and Thailand, charges are levied on most medical services but effective health card systems help to shield the poor (Khoman 1997; Saadah, Pradhan et al. 2001). In India, subsidisation of the poor works indirectly, through price discrimination. The poor can opt for lower quality but cheaper inpatient care on separate wards. This arrangement also operates in Indonesia. Informally, the poor or those considered unable to pay are likely to be exempted from charges in parts of India, Sri Lanka and Thailand. Kyrgyz and Thailand exempt both children and the elderly from charges. The elderly are exempt in the Philippines and pay a reduced co-payment in Korea.

TABLE 2

Comparing shares of OOP accounted for by inpatient care, ambulatory care and medicines is difficult given differences in the categorisation of expenditures. Nonetheless, the estimates presented in Table 1 reveal some consistencies in the composition of OOP payments that deserve comment. There are also some cross-country differences that do not seem spurious but reflections of differences in environment and policy. In general, inpatient care does not absorb the largest share of OOP payments. More is spent out-of-pocket on ambulatory care and on medicines. If this were not the case, the catastrophic and poverty impact of OOP payments would be greater since they would be concentrated on a fewer number of households receiving inpatient care. South Korea is the one exception, where 40% of OOP payments are for inpatient care. This is to be expected given that social insurance covers only 30-40% of the costs of inpatient care (Table 2). In contrast, there is 90-95% coverage of inpatient costs in Taiwan and, as a result, only 10% of OOP payments are for inpatient care.

The share of total OOP payments that goes on medicines is generally larger in the poorer, more rural countries. The share is 70% or more in Bangladesh, India and Vietnam. This is consistent with the greater prevalence of self-medication in poorer and particularly rural societies in which access to health services is constrained by income and distance (Chang and Trivedi 2003). Self-medication is a recognised problem in South Asia (Mudur 1999). But the entire OOP share attributed to medicines is not due to self-treatment. It includes medicines prescribed during treatment but purchased by the patient separately. In Bangladesh and Vietnam, the OOP shares on medicines are 70% and 88% respectively when all expenditures on medicines are included – those prescribed during treatment and not. When payments for prescribed medicines are included with the respective inpatient and ambulatory expenditures, the share of OOP spent on medicines, which is due to self-medication, is only 6.3% in Bangladesh and 37% in Vietnam. Nonetheless, spending on drugs, prescribed or not, generally accounts for a very large fraction of OOP payments.

3. Household budget shares of out-of-pocket payments

In this section, we examine the shares of household budgets absorbed by OOP payments for health care. For low- and middle-income territories, the household budget is defined as the value of consumption, including that from home production (see Table 3). For the high-income territories (Hong Kong, Taiwan and South Korea), the household budget is given by expenditure on market goods and services. Each survey contains detailed data on OOP payments for health care, covering at least payments for inpatient care, outpatient care and medicines (Table 3). These data are potentially subject to both recall bias and small sample bias due to the infrequency with which some health care payments are made. Longer reference periods should reduce bias through infrequency of purchase but at the cost of increasing recall bias. Survey estimates of aggregate health care payments tend to show discrepancies from production-side estimates, where the latter are available. There also tend to be discrepancies, at times substantial, between estimates of total private expenditure obtained from surveys and from national accounts procedures (Deaton 2004). In the present context, there is a problem if measurement error in OOP payments of health care differs substantially from that in other items of expenditure. It is very difficult to verify whether this is the case and there is little option but to rely on the expenditure survey estimates of the OOP budget share.

TABLE 3

There is substantial variation across territories in the OOP budget share (Table 4). On average across all households, OOP payments for health care absorb 4-5.5% of total household consumption in China, India, Bangladesh and Vietnam. All four of these countries rely on OOP payments for at least 60% of health financing. With the exception of (urban) China, they are amongst the poorest countries examined here. Associated with poverty, population health deficiencies drive up expenditures on health care and medicines.

The mean OOP budget share is much lower – 1.4-2.7% - in Malaysia, Thailand, Indonesia, the Philippines, Sri Lanka, Hong Kong, Kyrgyz and Nepal. With the exceptions of Indonesia, Kyrgyz and Nepal, these countries are less poor than the first group and rely less heavily on OOP financing. The low OOP budget shares in Indonesia

and Nepal are somewhat surprising given heavy reliance on OOP financing. The severity of poverty in Nepal may drive the share of spending on health care down. The majority of available resources must be deployed in the provision of food and shelter. The geography of these countries may deter utilisation of health care. But the apparent inconsistency between the high share of OOP in health financing and the low average OOP household budget share may, to an extent, be illusory. The health financing figures for Indonesia and Nepal do not come from a full set of national health accounts. The OOP share of financing may be overestimated. This is more likely for Indonesia than for Nepal.

In the two high-income territories operating a social insurance model with co-payments – South Korea and Taiwan – the mean OOP budget share is in the middle of the range, around 3.8%. The lower average budget share in Hong Kong (2.3%) is understandable given its higher levels of income and population health (O'Donnell, Van Doorslaer et al. 2005) and, in comparison with South Korea, by its lower reliance on OOP financing.

TABLE 4

Within each territory, there is a great deal of variation in the OOP budget share across households, suggesting that OOP payments are highly unpredictable. With the exceptions of India, Kyrgyz, Taiwan and Vietnam, the standard deviation of the share is at least 1.9 times the mean. This coefficient of variation is greatest in the four countries with the smallest mean shares – Malaysia, Thailand, Indonesia and the Philippines. The distributions are all highly right-skewed with the mean twice the median or more in all cases but for Taiwan, China and Vietnam. Using the median as measure of central tendency, Taiwan is among the territories with the highest OOP budget shares. This, together with the relatively limited variance and skewness in Taiwan, is explained by high rates of utilisation (Somanathan, O'Donnell et al. 2005), extensive co-payments for most services but high insurance coverage of inpatient care. It is less clear why the distribution is relatively dense in Vietnam. A possible explanation is that the extensive practice of self-medication gives rise to consistently high OOP payments (Chang and Trivedi 2003).

With the exceptions of China and Taiwan, concentration indices of OOP budget shares are positive indicating that the better-off spend a larger fraction of their resources on health care. This can also be observed in the quintile specific means of the OOP budget share. The gradient is steepest in Bangladesh, the Philippines, Indonesia and India. In Bangladesh, the richest fifth of households, on average, spend almost 9% of the household budget on health care, while the poorest fifth spend almost 3%. Bangladesh, India and Indonesia are among the poorest countries included in the study. The most plausible explanation of the steep income gradients in these countries is that the better-off can respond to health problems with the purchase of medicines etc, while the poorest of the poor cannot afford to divert resources from very constrained budgets. However, one should not overlook the fact that the poorest households in Bangladesh - a very poor country – spend a larger fraction of their available resources on health care than the richest households in high-income Hong Kong. This is explained by the tremendous differences in population health and insurance coverage. China and Vietnam are similar to Bangladesh and India in having a high mean OOP budget share but differ in that the distribution does not display a steep income gradient. In China, the rich actually spend relatively less out-of-pocket on health care. A consequence, one might suppose, of the lack of any fee exemptions for the poor, the collapse of collective payment schemes in rural areas and the greater health insurance cover enjoyed by the better-off, urban population (Henderson, Jin et al. 1995; Bloom and Gu 1997; Carrin, Aviva et al. 1997; Akin, Dow et al. 2004). Fee waivers exist in Vietnam but are restricted to the indigent identified by village committees (Table 2). Hong Kong appears to shield the poor better from charges than the social insurance systems of South Korea and Taiwan.

Our finding that the OOP budget share is typically increasing with the household budget is inconsistent with the common assertion that the poor spend proportionately more out-of-pocket on health care in low-income countries (Whitehead, Dahgren et al. 2001). The evidence cited to support this assertion is not from nationally representative expenditure surveys but from health surveys conducted in one, usually rural, region (Ensor and Pham 1996; Pannarunothai and Mills 1997; Fabricant, Kamara et al. 1999; Segall, Tipping et al. 2002).² Such surveys ignore payments made by the better-off urban population and do not measure total household resources as accurately as expenditure

surveys, often relying on income, which, particularly for poor households, is less indicative of living standards than is consumption. Support for our finding that the OOP budget share typically increases with total household consumption is provided by a study of India that is based on nationally representative expenditure survey data (Peters, Yazbeck et al. 2001).

Of course, the tendency for the OOP budget share to rise with the level of the household budget partly reflects the fact that poor households must devote the larger part of available resources to covering subsistence expenses on food and shelter. The impact of OOP payments on spending patterns might be better assessed through their share of household resources net of non-discretionary expenses. The mean share of OOP payments in household non-food expenditures is presented in the bottom part of Table 3. The differences between the OOP shares of total and of non-food expenditures are greater in the poorer countries, reflecting the greater share of resources devoted to food. The OOP share remains highest in Bangladesh, India and Vietnam, with 10.6-12.6% of non-food expenditures spent on health care. In Kyrgyz and Nepal, both of which are very poor, the ratio of OOP payments to total expenditure is relatively moderate but the OOP share of non-food expenditure is very high. The relative position of China moves in the opposite direction, reflecting its higher level of income. The switch in denominator results in a consistent fall in the value of concentration indices. This is to be expected given that the item removed from the denominator – food – is a necessity. Six of the indices are now negative indicating that the OOP share of non-food expenditure falls with increases in the level of non-food expenditure. This relationship is particularly strong in China, where the fifth of households with the smallest non-food expenditure spend 11% of this on health care and the top fifth spend just over 4% (figures not in table).

4. Catastrophic payments

Health care can be expensive. In the absence of insurance cover, households with severe and immediate medical needs can be forced to expend a large fraction of the household budget on health care. Such spending must be accommodated by cutting back on consumption of other goods and services, by accumulating debt, by running down

savings or by selling assets. Whichever the financing strategy adopted, the household suffers a cost that may be labelled “catastrophic”.³ The concept of catastrophic payments has been put into operation by defining them as occurring once OOP payments cross some threshold share of household expenditure (Berki 1986; Wyszewianski 1986; Pradhan and Prescott 2002; Wagstaff and Van Doorslaer 2003; Xu, Evans et al. 2003). While it is acknowledged that the choice of threshold is somewhat arbitrary, 10% of total expenditure has been a common choice (Pradhan and Prescott 2002; Ranson 2002; Wagstaff and Van Doorslaer 2003); with the rationale that this represents an approximate threshold at which the household is forced to sacrifice of other basic needs, sell productive assets, incur debt, or be impoverished (Russell 2004).

Note that the catastrophic effect of OOP payments may be incurred in the short and/or long-term. In the case that OOP payments are fully financed out of current income, a large OOP budget share implies the sacrifice of other consumption. If the household can draw on savings, credit, assets or gifts, then the short-term consequences of OOP payments will be reduced but there will be longer-term effects on household living standards that could possibly be catastrophic. For example, if depleted savings / assets are not sufficient to meet subsequent economic shocks, or if the household sinks into a spiral of debt. With the cross-section data typically used to examine the issue, short and long term consequences are not distinguishable. Nor does the definition of catastrophe by reference to a given share of household (one-period) resources restrict attention to short or long-term effects. A high share of a fixed budget implies sacrifice of other consumption. But a high budget share could also indicate that the household has depleted savings / assets or borrowed to cover the costs. The budget share alone does not tell us what financing strategy has been adopted.

Given the arbitrariness of the threshold budget share, we present estimates of the prevalence and intensity of catastrophic payments at a number of threshold values. Since, in low-income economies payments for health care can crowd-out food expenditures only to a limited extent, we examine OOP payments relative to non-food expenditure, as well as total expenditure.⁴

TABLE 5

In Table 5, we present the *catastrophic payment headcount* (H_c)- the percentage of households incurring catastrophic payments (Wagstaff and Van Doorslaer 2003). The headcount necessarily falls as the threshold is raised. For example, 28% of Bangladeshi households spend in excess of 5% of the total household budget on health care and a substantial 4.5% spend in excess of a quarter of the budget on health care.⁵ Changing the threshold does not affect substantially the countries that have the highest/lowest incidence of catastrophic payments (Figure 1). Catastrophic payments are most prevalent in Bangladesh, Vietnam, China and India. Vietnam has a higher proportion of households than Bangladesh spending in excess of 5% of the budget on health care but the ordering is reversed at all higher threshold values. At the lower threshold value of 5%, South Korea is close to Taiwan, with around 20% of households spending in excess of this threshold. But at higher thresholds, Korea is closer to the high incidence group and actually has a higher proportion of households than India spending in excess of 15% and even 25% of the budget. In fact, direct payments for health care absorb in excess of 25% of total expenditure in a remarkable 2.5% of Korean households. This reflects the very extensive use of co-payments, the non-coverage of many treatments and, in particular, the partial coverage of expensive inpatient care provided by the Korean social insurance system. By contrast, in Taiwan protection against very high OOP expenditures is similar to that in tax-financed Hong Kong. The incidence of catastrophic payments is lowest in Malaysia, Sri Lanka, Thailand, Indonesia and the Philippines, with less than 5% of households spending more than 10% of total expenditures on health care.

Table 5 also provides the catastrophic payments headcount defined at 15%, 25% and 40% of non-food expenditures. Bangladesh, China, India and Vietnam continue to have the highest incidence of catastrophic payments. Comparing the headcounts defined at 25% of non-food expenditure with those at 10% of total expenditure, which are broadly similar on average, we see that there are some significant re-rankings of the other territories (Figure 2). In particular, Kyrgyz and Nepal now join the other low-income countries in having a high proportion of households spending in excess of 25% of non-food expenditure. The degree of poverty in Kyrgyz and Nepal means that food absorbs a very large share of the household budget and the share of total resources that can be devoted to health care is limited. Once basic food needs have been met, health care

accounts for a large fraction of the remaining resources for a substantial fraction of the population. The high-income territories shift down the ranking. South Korea is no longer amongst the countries with the highest incidence and Taiwan now has the second lowest incidence. The grouping of territories by prevalence remains constant irrespective of the threshold of non-food expenditure share used.⁶

FIGURES 1 & 2

As is to be expected, and has been demonstrated elsewhere (Xu, Evans et al. 2003), countries relying most on OOP financing generally have the greatest prevalence of catastrophic payments (Figure 3). Of course, reliance on OOP financing is negatively correlated with national income and so there is a negative relationship between catastrophic prevalence and national income. India and Nepal appear to have a lower prevalence of catastrophic payments, given their level of reliance on OOP financing, than Bangladesh and Vietnam. We should be cautious since data on the OOP financing share for India and Nepal do not come from full health accounts and may lack accuracy. While China relies on OOP financing only slightly more than Indonesia, the prevalence of catastrophic payments is much higher in China than Indonesia. This does not appear to be simply a reflection of the fact that, on average, Chinese are better-off than Indonesians since the difference exists for catastrophic payments defined with respect to non-food expenditure, as well as total expenditure.⁷ Clearly, the propensity to spend on medicine is higher in China than Indonesia and there is less protection against very high medical bills that exhaust a substantial share of household resources. There is evidence that government intervention in Indonesia is effective in reducing exposure to catastrophic health payment risks (Pradhan and Prescott 2002).

FIGURE 3

The correlation of catastrophic payments with household rank in the distribution of living standards is reflected in the concentration indices (C_E) presented in Table 5 (Wagstaff and Van Doorslaer 2003). A positive index means prevalence is rising with household living standards. Using total expenditure as the measure of living standards

and the reference for catastrophic payments, prevalence is generally increasing with living standards. The better-off are more likely to spend large fractions of total expenditure on health care. The strength of the correlation increases as the threshold is raised. This is consistent with health care being a luxury good, although we should be careful in placing an income elasticity interpretation on a bivariate relationship. Switching to non-food expenditure gives smaller concentration indices that are more often negative. This is to be expected given food expenditures are a larger share of the budget of poorer households.

There is cross-country variation in the correlation between the prevalence of catastrophic payments and living standards that seems to be attributable to differences in national income, financing structure and user charging policy. Figure 4 shows the concentration indices for the catastrophic headcount defined at 10% of total expenditure. In the higher-income territories, there is either no correlation or the poor are more likely to incur catastrophic payments. Taiwan is the only territory in which the poor are more likely to spend in excess of 15% of total expenditure on health care (Table 5). Catastrophic payments are made disproportionately by the better-off in the Malaysia, Philippines, Indonesia, Thailand, Kyrgyz, Bangladesh and Sri Lanka. In each of these countries, with the exception of Kyrgyz and to a lesser extent Malaysia, the poor are exempted from public sector user charges where they exist (Table 2). This is not the case in China and Vietnam, where there is a high incidence of catastrophic payments that the poor are no less likely to incur.

FIGURE 4

In placing a normative interpretation on catastrophic payments, one may wish to give more weight to excess payments incurred by poorer households. Large expenditures on health care that are incurred by better-off households at the cost of expendable consumption may be judged quite differently from payments made by poor households that are forced to cut back on consumption of basic necessities. A statistic that reflects not only the prevalence but also the distribution of catastrophic payments can be obtained by multiplying the catastrophic headcount by the complement of its concentration index, $WH = H_C \cdot (1 - C_E)$ (Wagstaff and Van Doorslaer 2003). This statistic is equivalent to a

weighted sum of a catastrophic payment indicator variable, with weights declining linearly from 2 to 0 as one moves from the worst-off to the best-off household.⁸ If households exceeding the threshold tend to be better-off, the concentration index C_E will be positive, and WH will be less than H_C . This is generally the case, with the opposite arising consistently only in Taiwan and, occasionally, depending on the threshold, in China, South Korea and Vietnam (Table 5). But the difference between the weighted and unweighted indices is generally modest (Figure 5). Taking account of the distribution has relatively little impact on the cross-country picture. Given the high concentration of catastrophic payments on the better off in Bangladesh, its weighted incidence moves down relative to that of China and Vietnam.

FIGURE 5

The headcount gives the prevalence and not the intensity of catastrophic payments. The latter may be defined as the mean payment in excess of the threshold over all households exceeding the threshold - the *mean positive overshoot (MPO)* (Wagstaff and Van Doorslaer 2003). Both the prevalence and intensity are reflected in the *catastrophic payment overshoot (O)* - the average degree by which payments (as a proportion of total expenditure) exceed a given threshold (z). Define the excess payment of household i as $O_i = E_i((T_i/x_i) - z)$, where T is OOP payments, x is household expenditure (total or non-food) and E is an indicator equal to 1 if $T_i/x_i > z$ and zero otherwise. The average overshoot is given by $O = \frac{1}{n} \sum_{i=1}^n O_i$, where n is the sample size. Then, $O = H_C * MPO$.

Since the majority do not incur catastrophic payments, the mean overshoot (O) is dominated by the prevalence. It is not surprising, therefore, that the overshoot statistics presented in Figure 6 display the same general pattern across countries as the headcount statistics (see also Table 6). There are, however, a few notable exceptions. Defining catastrophic payments at 25% of non-food expenditure, Nepal has the highest mean overshoot (Figure 6) although it had only the fifth highest prevalence (Figure 2), implying a very high intensity of catastrophic payments. Amongst those spending more than 25% of total non-food expenditure on OOP payments in Nepal, the average OOP

share exceeds this threshold by 34 percentage points (Table 6), giving a staggering 59% OOP budget share. In Bangladesh, the average budget share for those exceeding the 25% of non-food expenditure threshold is 44% and among the equivalent ‘overshooters’ in Taiwan, it is 37%. But only 1.5% of households exceed the threshold in Taiwan, compared with almost 15% in Bangladesh. The much lower cross-country variability in the intensity of catastrophic payments than in the prevalence reflects the fact that, given other needs, there is an upper limit on the proportion of household resources that can be devoted to medical expenditures. Concentration indices for “excess” health payments generally display similar patterns to the corresponding indices for the prevalence.

FIGURE 6 & TABLE 6

5. Poverty impact

Medical expenditures can be impoverishing. Paying for health care can be at the expense of meeting basic needs for food, clothing and shelter. But such impoverishment is not captured by the standard approach to the measurement of poverty that compares total household resources – including those exhausted by health care – with a poverty line that reflects needs for food, clothing and shelter but often not health care.⁹ If expenditures on health care were completely non-discretionary, constituting resources that are not available to meet other basic needs, then it would be appropriate to assess poverty on the basis of household resources net of payments for health care.¹⁰ Of course, not all expenditures on health care are made without discretion.¹¹ There is ample evidence that such expenditures are responsive to incomes and prices. Nonetheless, it is likely that households make great sacrifices in order to meet needs for vital health care. It seems inaccurate to categorise a household as non-poor simply because high medical expenses raise its total spending above the poverty line, while its spending on food, clothing and shelter is below subsistence levels. Poverty measured on the basis of household expenditure net of OOP health payments is arguably at least as interesting as conventional measures.

The difference between poverty estimates derived from household expenditures *gross* and *net* of OOP payments for health care provides a rough approximation to the *poverty impact* of such payments (Wagstaff and Van Doorslaer 2003; Gustaffson and LI 2004). If OOP payments for health care were completely non-discretionary and total household resources fixed, the difference between the two estimates would correspond to the number of individuals that are driven into poverty by OOP payments and would be relieved from poverty if such payments did not exist. Neither of the two conditions holds perfectly. A household that chooses to spend excessively on health care is not pushed into poverty by OOP payments. A household may borrow to cover health care expenses. Then, household expenditure gross of OOP payments does not correspond to the resources that would be available in the absence of those payments. For such reasons, our simple comparison of poverty estimates cannot be interpreted as the change in poverty that would arise from some policy reform that eliminated OOP payments for health care.¹² Nonetheless, the comparison is informative of the order of magnitude of the effect that health payments have on the prevalence of poverty. As shorthand, we refer to the difference between poverty estimates net and gross of health payments as the *poverty impact* of those payments.

We use two absolute poverty lines developed and used by the World Bank – (international) \$1.08 and \$2.15 per capita per day at 1993 purchasing power parities (Ravallion, Chen et al. 1996; Ravallion 1998; Chen and Ravallion 2001). The lower of these is the median of the ten lowest poverty lines operational in a sample of low-income countries (Ravallion, Datt et al. 1991). It represents a very low living standard that is often referred to as “extreme poverty” (Chen and Ravallion 2004). It makes no explicit allowance for health care needs. The higher poverty line is simply twice the lower one and is intended to roughly correspond to the threshold at which someone would be considered poor in middle-income countries (Chen and Ravallion 2004). It still represents a very low living standard that is unlikely to be sufficient to cover health care needs. \$2 per day is a small fraction of the official US poverty line that does not explicitly allow for health care needs. Since health care needs are not reflected in these low absolute poverty thresholds, it is consistent to compare them with household resources net of OOP health payments.

In Table 7 we present the *poverty headcount ratios* (H_p) based on household consumption/expenditure both gross and net of OOP health payments relative to each of the two poverty lines.¹³ Results are not presented for the three high/middle income territories (Hong Kong, South Korea and Taiwan) since absolute poverty is near non-existent and it remains so after taking account of OOP health payments.¹⁴ Poverty is highest in Nepal, where we estimate 39.3% of individuals live on less than the equivalent of \$1.08 per day (1993 PPP), followed by India (31.1%), Bangladesh (22.5%), the Philippines (15.8%) and China (13.7%). Relative to a standard of \$2.15 a day, over two-thirds of the populations of Nepal, India and Bangladesh live in poverty and at least a quarter of every country other than Malaysia and, marginally, Thailand is poor. These estimates are quite consistent with those of the World Bank (Chen and Ravallion 2004).¹⁵ At the \$1.08 poverty line, our poverty rate estimate for China is three percentage points lower than that of the World Bank. The data are from the same survey but a different year and, probably most important, we had access to data from only ten provinces. Weights were used to make the ten provinces nationally representative but they do not appear to have been entirely adequate. There is also a four percentage point difference in the \$1 estimates for India. But this is due to the fact that Chen and Ravallion (2004) adopt the Deaton (2003) correction to make their estimates comparable over time. Without this correction, the Chen and Ravallion (2004) estimate (32.3%) is almost within one percentage point of our own (31.1%). Our estimate for Sri Lanka at the \$1 poverty line is substantially less than that of the World Bank (3.8% against 6.6%). The use of different surveys is the most likely explanation. The one remaining substantial discrepancy is for Bangladesh, where our estimate, from the same data, is four percentage points lower than that of the World Bank. We have been unable to identify the source of this inconsistency.

At the \$1.08 poverty line, subtracting OOP payments from total resources results in a 3.8 percentage point increase in the headcount in Bangladesh, equivalent to almost 5 million people, a 3.7 percentage point increase in India (over 37 million) and a 2.6 percentage point increase in China (32.4 million) (Table 7). The total estimated increase in the poverty headcount is 78.25 million people, or 2.7% of the population of these eleven low/middle-income Asian countries. As acknowledged above, this does not provide an estimate of how poverty would change if some form of pre-payment replaced

OOP financing of health care. Identification of such an effect would require tracing the impact of such a reform on households' utilisation of health care, work effort, consumption and savings. Nonetheless, the figure is informative of the magnitude of the impoverishing effect of payments for health care that is not currently reflected in poverty estimates. It tells us how many individuals are not counted as poor despite the fact that the value of their consumption of all goods and services other than health care is less than the extreme poverty line of \$1.08 per day.

TABLE 7

In absolute percentage point terms, the largest increases in poverty at the lower poverty line are in Bangladesh, India, China and Nepal. Of course, the number of individuals pushed into poverty by OOP payments is greatest in India and China. The relative increase in poverty is greatest, by far, in Vietnam, where the poverty rate rises by a third. It rises by 18.9% in China, 16.8% in Bangladesh and 11.9% in India. As we saw in previous sections, these are the countries with the highest OOP budget shares and prevalence of catastrophic payments. It would appear to be both the high levels of OOP payments and their even distribution throughout the income distribution that is responsible for the very high poverty impacts in Vietnam and China. But there are still large poverty impacts in Bangladesh and India, where OOP payments are more heavily concentrated on the better-off.

Regression analysis confirms that the percentage point change in the poverty headcount is positively correlated with the OOP financing share and, as would be expected, with the initial headcount (Table 8). The OOP share does not reach conventional levels of significance but the sample size is very small.¹⁶ Deviations from the positive correlation between the initial poverty headcount and the absolute poverty impact are more interesting than the relationship itself. The initial headcount is actually higher in the Philippines than it is in China but the poverty impact is more than four times greater in China. The initial headcounts are similar in Sri Lanka and Vietnam but the poverty impact in Vietnam is four times than in Sri Lanka. These differences point to the consequences of high reliance on OOP financing in China and Vietnam. Controlling for the OOP share and the level of poverty, neither national income per capita nor the

distribution of health payments (represented by the concentration index) gave any signs of significance. The proportion of the population at risk of falling below the \$1 threshold, defined as those initially between the \$1 and \$2 thresholds, had a positive correlation but a p-value of 0.593. The lack of significance suggests that there is substantial cross-country variation in the extent to which vulnerable individuals are protected from the impoverishing effects of health payments. This can be seen directly in figure 7. Roughly one-half of the population live on between \$1 and \$2 per day in Bangladesh, India and Indonesia. However, while 3.7% of the population slip below the \$1 threshold in both Bangladesh and India after subtracting payments for health care, only 0.7% of Indonesians are impoverished. In the five countries in which 30-40% of the population lie between the two poverty thresholds, there are substantial differences in the poverty impacts. Over 2% are impoverished in China and Nepal, 1.2% in Vietnam and much less than 1% in the Philippines and Sri Lanka. Again, these differences reflect different degrees of reliance on OOP financing. But this does not explain all the differences. Vietnam is more heavily reliant on OOP payments than China but is apparently more successful in limiting their impoverishing effect.

TABLE 8 & FIGURE 7

At the higher poverty line of \$2.15 per day, the poverty rate across all countries rises from 58.8% to 60.8%. This is a smaller percentage point increase than occurs at the lower poverty line and is equivalent to an increase of 56.7 million individuals counted as poor. This is a much smaller percentage change in the poverty rate than occurs at the \$1.08 line (3.4% as opposed to 14%). The relative increase in poverty continues to be largest in Vietnam but now followed by Kyrgyz before Bangladesh. The percentage change in the poverty rate in Sri Lanka is now greater than that in India and China (marginally).

Our estimates are broadly consistent with the limited existing evidence on the impoverishing effect of OOP payments for health care obtained from large-scale surveys in Asia. (Peters, Yazbeck et al. 2001) estimate from the 1995-96 National Sample Survey

that taking account of OOP payments raises the Indian poverty rate by 2.2 percentage points at the national poverty line. They estimate that one-quarter of those hospitalized in India is impoverished by the cost. (Gustaffson and LI 2004)) estimate that payments for health care raised the percentage of the rural Chinese population falling below the \$1 a-day threshold from 19.8% to 20.8% in 1988 and from 17.6% to 20.1% in 1995. (Lui, Rao et al. 2003) estimate that OOP payments added another 3.26 percentage points to the pre-payment poverty headcount of 7.22% at the official poverty line in rural China in 1998. (Wagstaff and Van Doorslaer 2003) using the Vietnam food poverty line, find that OOP payments raised the poverty headcount from 15% to 18.4% in 1998. Only 0.4% was due to hospital costs, the remainder being mainly due to expenditure on drugs. Qualitative studies have also suggested a large impoverishing effect of health care payments. The World Bank *Voices of the Poor* study found that after illiteracy and unemployment, health costs were reported as the most important precursor to poverty among the poor (Narayan 2000). A retrospective study in 35 villages in Rajasthan, India found that health and health expenses were one of three main causes that lie behind 85% of all cases of impoverishment (Krishna 2004). One-half to two-thirds of all households falling into poverty mentioned ill-health and health expenses as a contributory cause. Such impoverishment is of even greater concern given evidence from another detailed study in Rajasthan that shows the health care purchased is often of poor quality, even harmful (Banerjee, Deaton et al. 2004).

The poverty headcount reflects only the prevalence and not the intensity of poverty. Both dimensions are captured by the *poverty gap*, $G = \frac{1}{n} \sum_{i=1}^n P_i (PL - x_i)$, where PL is the poverty line and $P_i = 1$ if $x_i < PL$ and is zero otherwise. To facilitate comparison across countries, we present the *normalised poverty gap*, $NG = G/PL$, in Table 8. Poverty is most severe in Nepal where, on average, the deficit of total household expenditure is more than 10% below the \$1.08 threshold. This deficit rises by almost a percentage point when OOP payments for health care are subtracted from total resources. The poverty gap is also large in India, Bangladesh and China and the absolute impact of OOP payments on the gap is largest in these three countries, together with Nepal. The gap is also large in the Philippines but the impact of OOP payments is much less,

suggesting that the poor are better protected from health care costs. As with the poverty headcount, the relative impact of OOP payments on the gap is greatest in Vietnam followed by China, Bangladesh and India. The relative picture is much the same using the \$2 a day poverty line.

TABLE 9

The impoverishing effect of health care payments in Bangladesh and China is shown graphically in Figures 8a and 8b (Wagstaff and Van Doorslaer 2003). The charts plot household pre-payment consumption per capita against the cumulative percentage of individuals ranked by pre-payment consumption (the yellow curve). At the intersection of this curve with the poverty line, the x-coordinate is the poverty headcount - 22.5% in Bangladesh and 13.7% in China at the \$1.08 poverty line. The area below the poverty line above the pre-payment curve gives the poverty gap. From the pre-payment curve, the red “paint-drops” show what happens to consumption after payments for health care are subtracted. This shows the individuals that are pulled below the poverty line by such payments. In Bangladesh, it is clear that many of the individuals below the \$1 a-day threshold on the basis of gross consumption are even further below this standard when medical expenses are netted out. There are also many individuals in the middle of the gross expenditure distribution that are pulled below the \$1 a-day threshold when health payments are not considered part of disposable resources. There are even some individuals located as high as the 90th percentile of the gross expenditure distribution that have less than a \$1 per individual per day to spend after meeting health care needs. It is highly likely that the gross expenditure of such individuals has been driven up by urgent medical needs and consequently provides a very misleading picture of living standards (O'Donnell, van Doorslaer et al. 2005). In China, it is mainly individuals in the bottom third of the gross expenditure distribution that are pulled below the \$1 a-day threshold by medical expenses, while those in the middle third of the pre-payment distribution are most likely to be left below the \$2 per day threshold after netting out health payments. There are also many individuals high up in the pre-payment distribution that incur

catastrophic medical expenses, without these quite driving the household into absolute poverty.

FIGURES 8a & 8b

6. Conclusion

This paper substantially adds to the evidence base on the incidence, the distribution and the consequences of out-of-pocket payments for health care in Asian countries. Detailed analysis of new micro level survey data has delivered the following findings. First, there is still heavy reliance on out-of-pocket financing of health care in Asia. The OOP share of health funding is at least a third in all territories included in this study, exceeds three fifths in Bangladesh and China and over three quarters in Vietnam, India and Nepal. Second, such heavy reliance on OOP financing has important consequences for household living standards. OOP payments for health care absorb more than one quarter of household resources net of food costs in at least one-tenth of all households in Bangladesh, China, India, Nepal and Vietnam. Such levels of spending can only be accommodated through the diversion of considerable resources from other items of consumption and/or through the disruption of consumption paths across time. The consequent negative welfare costs may be termed “catastrophic”. Third, there are important differences across countries, not only in the scale of OOP payments for health care, but also in their distribution. In high-income territories, catastrophic payments tend to be evenly distributed, or even slightly concentrated on the less well-off. In most low-income countries, however, it is households with higher total expenditure that are more likely to spend a large fraction of those resources on health care. This reflects the inability of the poorest of the poor to divert resources from basic needs. But in some countries, it also seems to reflect the protection of the poor from user charges. In China, Kyrgyz and Vietnam, where there are no exemptions of the poor from charges, the poor are as likely, or even more likely, to incur catastrophic payments. Fourth, despite the concentration of catastrophic payments on the households with higher total expenditures in the majority of low-income countries, OOP payments still push lots of Asian families

(further) into poverty. Over seventy-eight million people in the eleven low/middle-income countries included in this study, or about 2.7% of the total population, are pushed below the very low threshold of \$1 per day due to payments for health care. That is a substantial number, and many more millions, who were already very poor, are pushed deeper into poverty.

What policy lessons can be drawn from these findings? The facts that the OOP financing share is negatively related to the level of development and positively to the degree of financial hardship arising from health payments might lead one to the somewhat fatalistic conclusion that there is little to be done other than the promotion of economic development. Only once an economy has developed sufficiently, and acquired an established formal sector, will it be possible to shift health financing to a range of pre-payment mechanisms and consequently reduce the disruptive effect on household welfare of payments for health care. Undoubtedly, there is much truth in this assessment. But our results show that while economic development is certainly an important determinant of the degree to which household welfare is put at risk by health payments, there is no iron law that condemns the households of low-income countries to suffer financial hardship and poverty because of these payments. Malaysia, the Philippines, Sri Lanka and Thailand have managed to contain the OOP health financing share below the average level at their national incomes. In contrast, Bangladesh, China, India, and Vietnam, stand out in relying heavily on OOP financing, having a high incidence of catastrophic payments and a large poverty impact of these payments. While the second group of countries is, in general, poorer, there is little difference between the average incomes of China and Sri Lanka. Sri Lanka is striking as a low-income country that manages to rely on OOP payments for just less than half of health financing and still further because the catastrophic and poverty impact of these payments are modest. This reflects the near absence of charges in the public sector. The majority of OOP payments are made by the better-off for private alternatives to public care. A given level of exposure to OOP payments does not always translate into the same catastrophic and poverty impact. Indonesia relies on OOP financing only slightly less than China but has much smaller catastrophic and poverty impacts of health payments. Targeted exemptions, implemented through a health card, appear to have had some success in shielding poor families from

high payments for health care in Indonesia (Pradhan and Prescott 2002). The lack of such a scheme in China not only results in a greater prevalence of catastrophic payments but also in a greater concentration of OOP payments on low-income households and a greater poverty impact. Thailand has been even more successful than Sri Lanka and Indonesia in constraining the living standards consequences of OOP health payments. Its more developed economy allows a greater share of health funding to be raised from taxes but, in addition, an effective health card system has protected the poor from charges and the introduction of a flat rate minimal (30 Baht) charge for individuals with universal coverage insurance has further weakened the impact of OOP payments on household budgets. At a higher level of income, Malaysia has been able to push down the OOP financing share and to avoid catastrophic payments even more successfully than the substantially wealthier economies of Hong Kong, South Korea and Taiwan. The above makes clear that both the catastrophic and the poverty impacts of OOP payments depend upon three inter-related factors: (i) the degree of reliance on OOP financing, (ii) the nature and distribution of OOP payments and (iii) the public sector user charging policy and the effectiveness with which the poor are exempted from charges.

While our study contributes to a better understanding of the impact of OOP payments on household living standards, it does have important limitations. First, it does not examine the obvious impact of OOP payments on the quantity and quality of care consumed. Its interpretation therefore has to be complemented by studies of health care utilization (Somanathan, O'Donnell et al. 2005) and the incidence of public spending (O'Donnell, van Doorslaer et al. 2005). Second, identification of household level factors that explain variation in the incidence of catastrophic payments would make it possible to draw more policy implications from the analysis. We undertake this analysis elsewhere (O'Donnell, van Doorslaer et al. 2005). Third, the analysis does not capture all potentially catastrophic effects of illness or disability, such as lost earnings, and does not investigate whether health shocks are absorbed by using borrowing or dis-saving to smooth consumption (Gertler and Gruber 2002). To the extent that households do smooth consumption, our finding that, in low-income countries, households with higher total expenditures are more likely to incur catastrophic payments is, at least in part, a reflection of inter-temporal financing of health payments. There is some support for this hypothesis

in results we report in another paper (O'Donnell, van Doorslaer et al. 2005). Fourth, because of inconsistencies in the categorization of OOP payments, we have not attempted to identify the catastrophic and poverty impacts of specific categories of payments. From the decomposition of aggregate OOP payments (Table 1), it appears that payments for medicines are more important and those for inpatient care less important than one might expect. Charging for drugs is perhaps the most important area of policy to be considered in order to address the catastrophic and poverty impacts of OOP payments. Finally, the study has described OOP payments for health care and has not attempted to identify the impact on household living standards of alternative policies that might impact on such payments.

Figure 1: Percentage of households incurring catastrophic payments - various thresholds for OOP as % of total expenditure

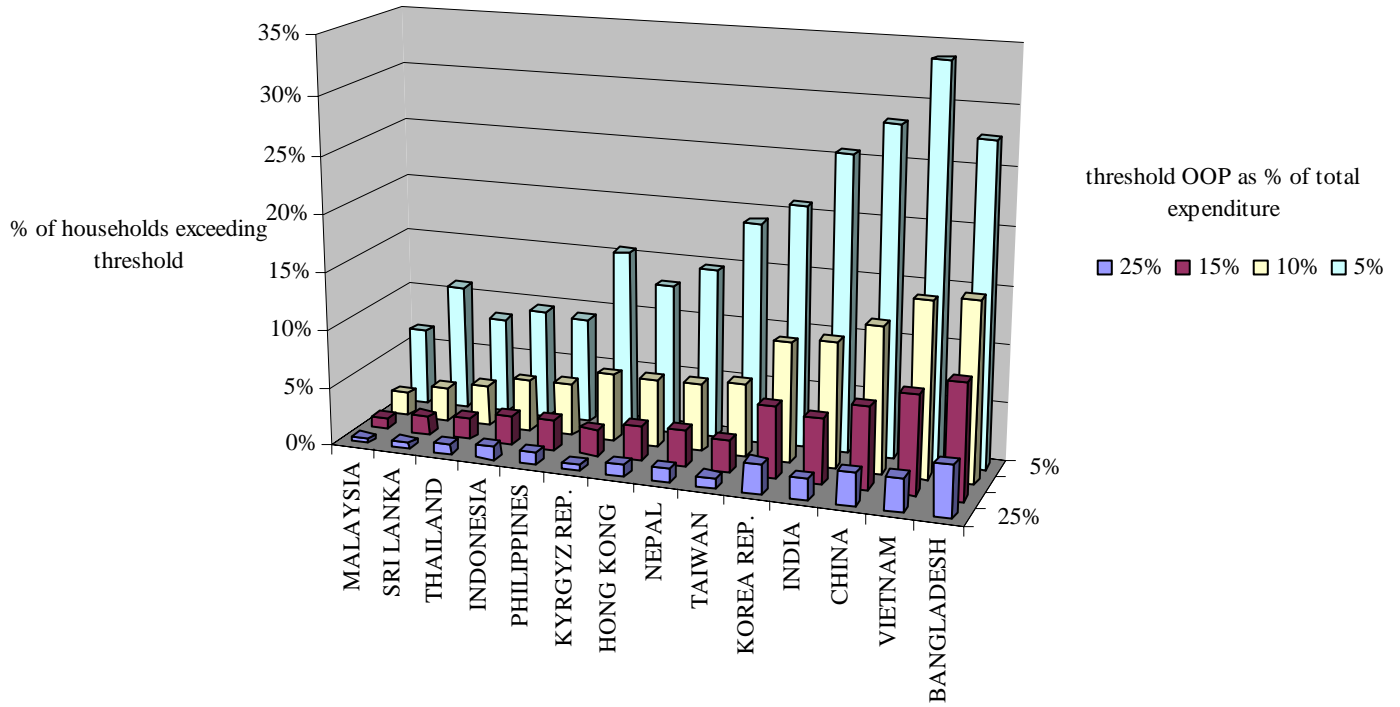


Figure 2: Incidence of catastrophic payments defined relative to total and to non-food expenditures

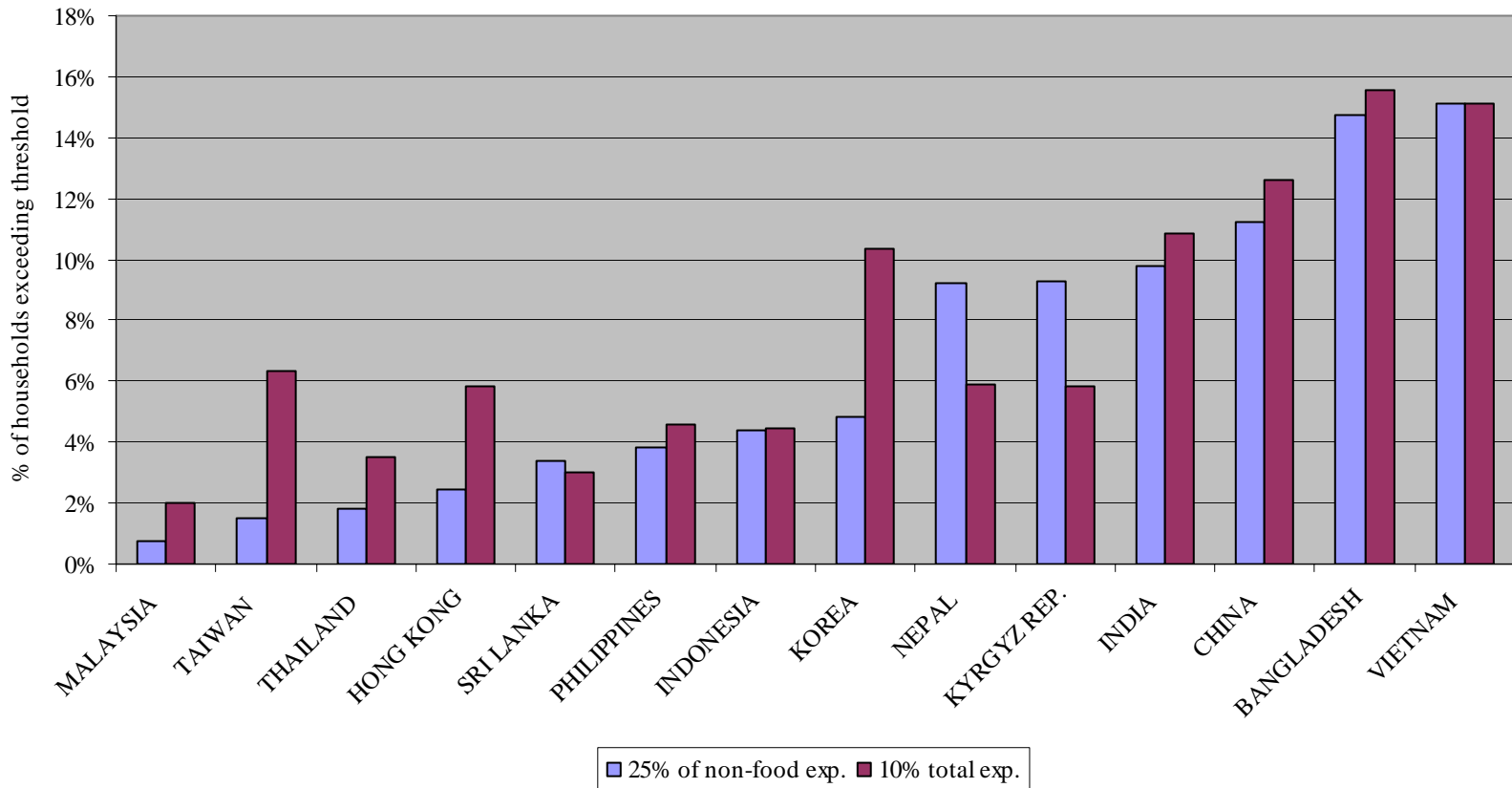


Fig 3: Catastrophic headcount against OOP financing share (OOP>25% of non-food exp)

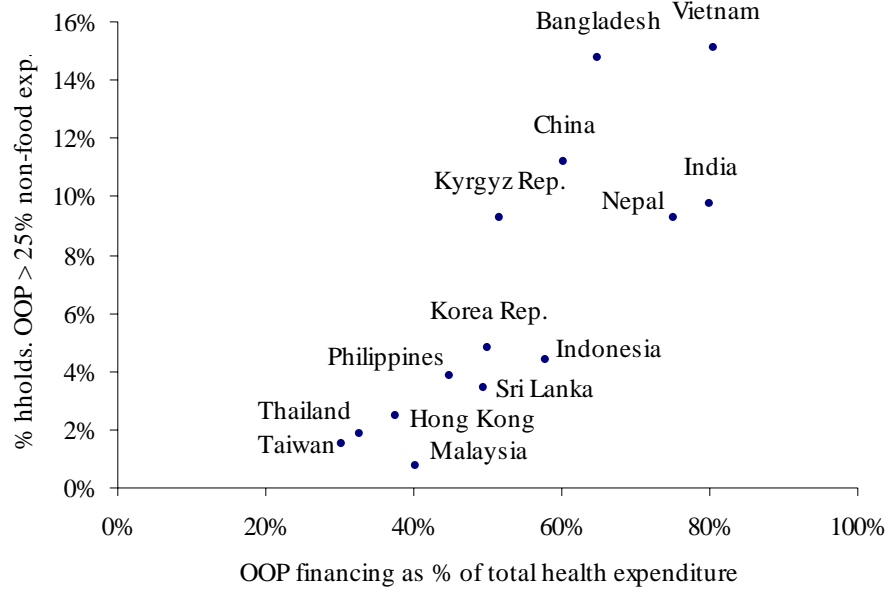


Figure 4: Concentration indices for catastrophic headcount (OOP>10% total exp.)

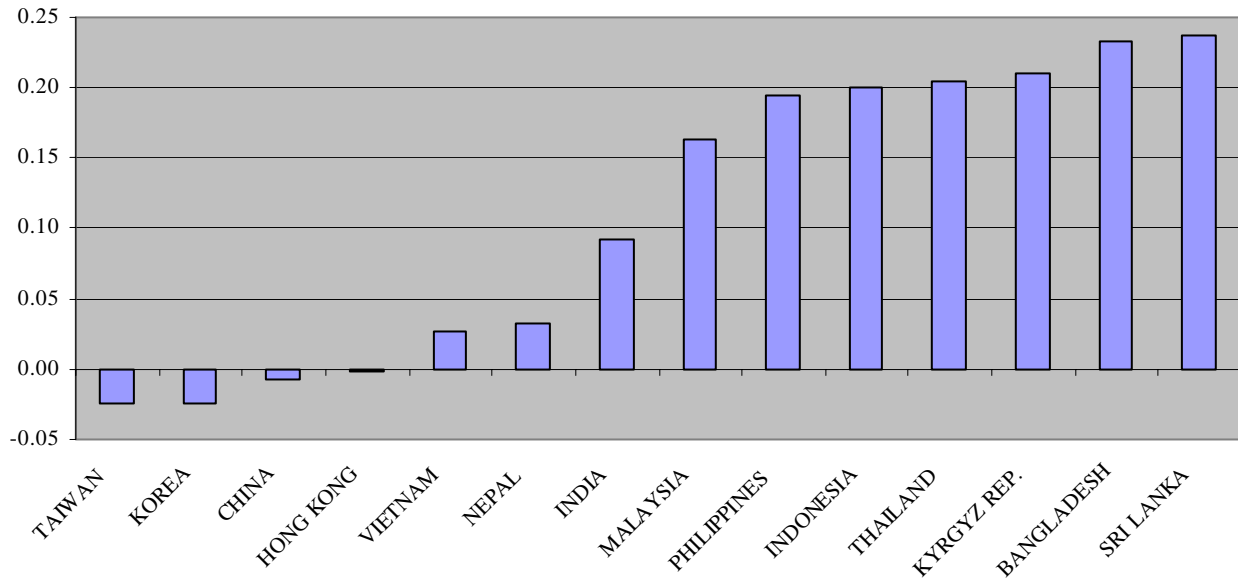


Figure 5: Distribution weighted and unweighted incidence of catastrophic payments (oop>10% total exp.)

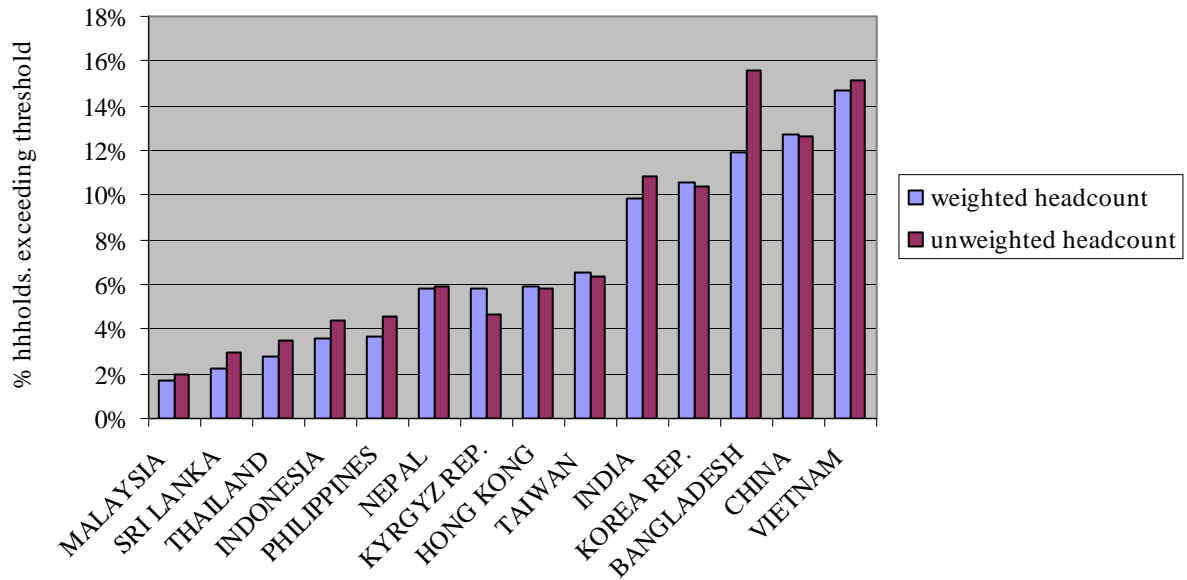


Figure 6: Mean catastrophic overshoot

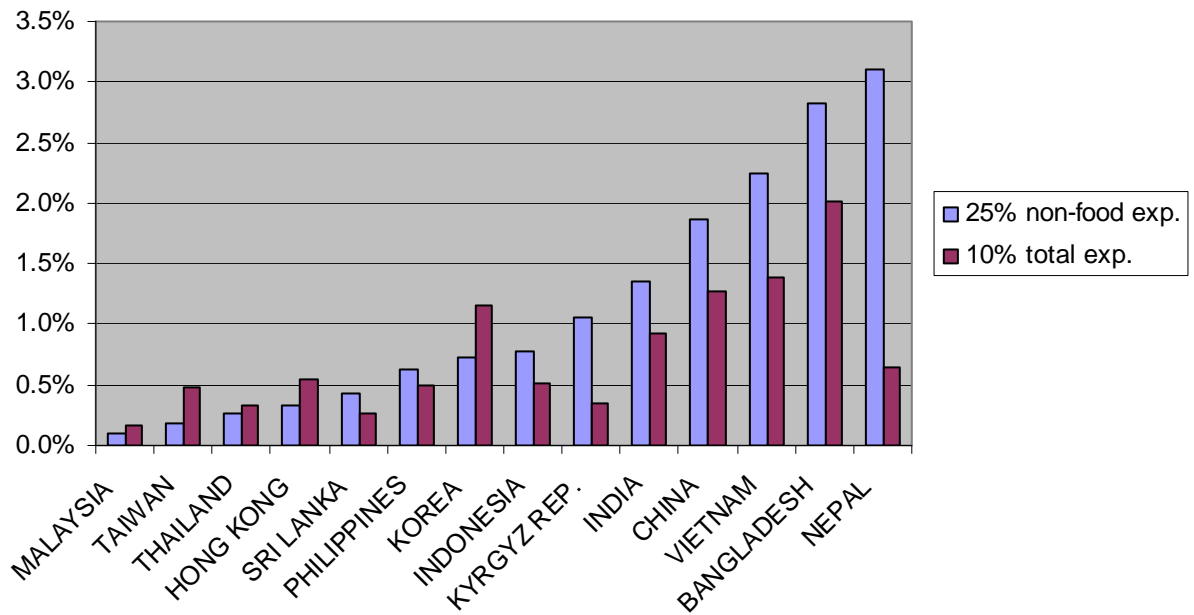


Figure 7: Poverty impact and population at risk

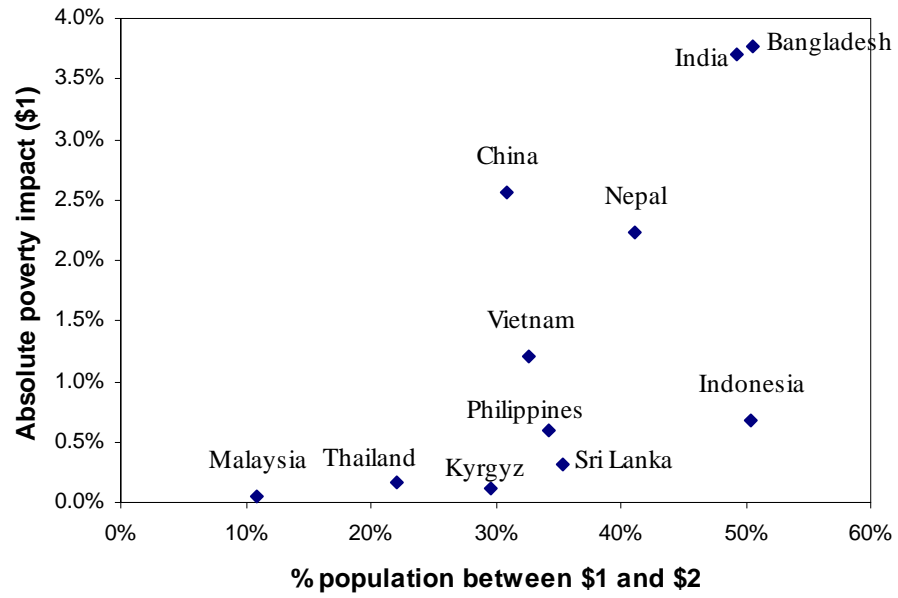
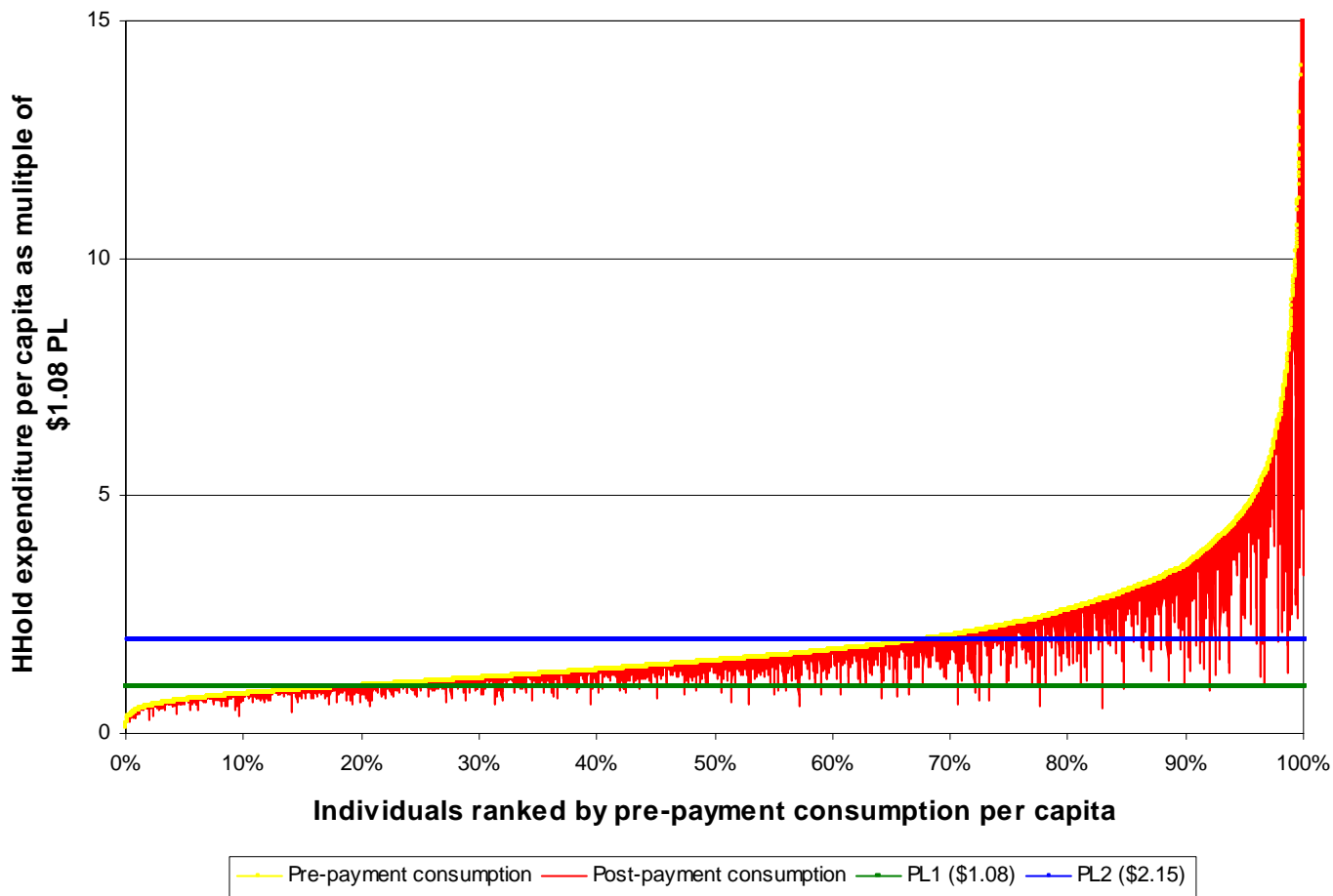


Figure 8a: Pen's parade - Bangladesh 2000



Pen's parade - Chi na 2000

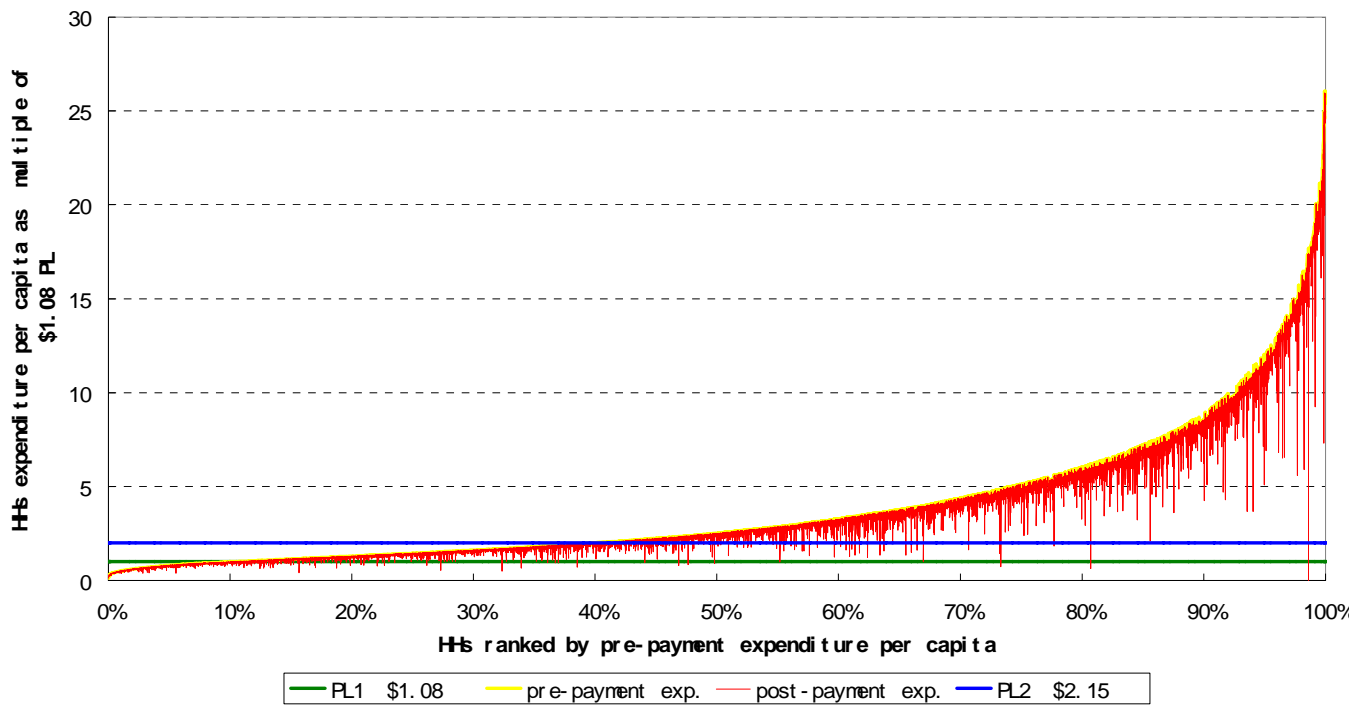


Table 1: Out-of-pocket payments – health financing contribution and composition

		OOP as % of total expenditure on health (THE)	Percentage of total OOP payments on:				Traditional / home/ other
			Public sector care	Inpatient care	Ambulatory care	Medicines	
Bangladesh ^a	(2000)	64.85%	0.50%	8.90%	6.46%	70.32%	14.32%
				11.60%	73.80%	6.30%	8.30%
China	(2000)	60.35%	N/A	N/A	N/A	N/A	N/A
Hong Kong	(1996-97)	37.64%	6.36%	16.98%	38.99%	7.56%	36.47%
India ^b	(2002)	80.00%	25.61%	9.26%	11.15%	74.72%	4.87%
Indonesia	(2001)	57.74%	23.19%	12.50%	52.95%	34.55%	0.00%
Korea, Rep.	(2000)	49.88%	N/A	39.83%	22.02%	32.53%	5.63%
Kyrgyz Rep. ^c	(2000/1)	51.68%	44.52%	12.21%	27.94%	55.85%	4.00%
Nepal ^d	(1994/5)	75.00%	N/A	N/A	N/A	N/A	N/A
Malaysia ^e	(1998/9)	40.20%	7.17%	24.82%	45.41%	24.66%	5.11%
Philippines	(1999)	44.91%	N/A	N/A	N/A	N/A	N/A
Sri Lanka	(1996-97)	49.59%	0.86%	10.00%	31.00%	47.00%	12.00%
Taiwan	(2000)	30.15%	N/A	10.89%	27.71%	23.14%	38.26%
Thailand	(2000)	32.74%	34.93%	26.15%	56.17%	17.68%	0.00%
Vietnam ^{a f}	(1998)	80.50%	37.25%	8.40%	2.58%	87.98%	1.04%
				32.35%	21.07%	36.99%	9.59%

Notes: OOP as % of TEH figures are from National Health Accounts estimates unless stated otherwise below. Shares of OOP spending by sector and type of care are computed from the survey data. N/A – not available since survey gives aggregate OOP spending on all care only.

- In the top row, the shares of OOP spent on inpatient and ambulatory care do not include payments for medicines prescribed on receipt of care, which are included in the “medicines” column. In the bottom row, payments for prescribed medicines are included with the respective inpatient / ambulatory care and the “medicines” column includes self-medication only.
- OOP as % of TEH is estimate from World Health Report 2002, WHO. Public care % from 1995-96 Health Survey. Remainder from 1999-2000 National Sample Survey. % for medicines may be overestimated due to difficulty of distinguishing doctor charges from medicines in data.
- Share of OOP on public care from Kyrgyz Treasury data. Share of medicines includes payments for medicines prescribed through ambulatory care only.
- OOP as % of TEH from (Hotchkiss, Rous et al. 1998)
- OOP as % of THE is for 1999 from World Health Report 2002, WHO.
- OOP as % of TEH from (World Bank 2001).

Table 2: User charges for public sector care and co-payments for care covered by Social Health Insurance

	Charged services	Free Services	Income / poverty related fee waivers	Non-poor groups exempt from charges
Bangladesh	Secondary services (nominal registration fee for inpatient/outpatient); Inpatient care in major hospitals.	Most primary care (/local services); medicines within facility; immunization; some reproductive healthcare.	Poor exempt or pay lower charge	Civil servants (selected services)
China	Inpatient (incl. medicines); Outpatient (incl. medicines).	Vaccination; immunisation; family planning.	None	Old Red Army soldiers and Retirees
Hong Kong SAR	Inpatient (incl. medicines); outpatient (incl. medicines); dental.	accident & emergency (until Dec. 2002)	Welfare recipients exempt	Civil servants & dependents (reduced rate for IP); hospital staff & dependents.
India	Inpatient bed charge; outpatient registration charge; certain medicines; tests/x-rays; dental	Hospital consultation and certain medicines. Primary care/health centre/polyclinic consultation and medicines. Family planning. Vaccinations and immunisations.	None formally. Indirect relation to income through price differentiation in inpatient care. Informally, "poor" can be exempted partially or fully from charges.	Civil servants
Indonesia	All medical care and medicines.	None	Poor exempt from all charges. Indirect relation of inpatient charges to income through price discrimination.	Charges determined at local government level. Some better off local govts. provide free health centre care
Korea Rep.	All medical care & medicines. Co-payments under SHI are 20% (to limit) for inpatient and 30-55% for outpatient depending on institution. In addition, some services are not covered by SHI and paid for OOP. Sum of co-payment and OOP estimated at 40-50% for outpatient and 60-70% for inpatient care.	None	None. SHI premium is proportional to income but co-payments and charges not related to income.	Elderly (>65 yrs.) pay half deductible for outpatient care from clinics.
Kyrgyz Rep.	Consultations with specialist primary care (eg, physiotherapy; psychotherapy). Dental care. Complex diagnostics. Family planning.	GP consultation and prescribed medicines. Hospital care - IP, OP and medicines (payment for medicines may be requested). Certain diagnostics and X-ray. Vaccination and immunisation.	None	Children up to 18; pensioners; war veterans & dependents; disabled; pregnant women; those with state awards; military.

	Charged services	Free Services	Income / poverty related fee waivers	Non-poor groups exempt from charges
Nepal	All medical care and medicines. Nominal charge for outpatient varying with facility.	Emergency services; selected vaccines, immunisation and reproductive health services. 60% subsidy for medicines at Health Posts and Primary Care centres.	Poor either exempt or pay reduced charge but not fully implemented.	None
Malaysia	Hospital inpatient and outpatient. Primary care. Dental care. Diagnostics and x-rays.	Family planning and vaccinations / immunisations. Outpatient ante and post natal care. Treatment of infectious diseases on 3 rd class wards. Dental care for pregnant women and pre-school children.	Hospital directors have discretion to waive fees for destitute. Upper limit on charges for 3 rd class ward patients	Infants less than 1 year (outpatient). State rulers, Governors and families. Civil servants (incl. retired) and dependents. Local authority employees and dependents.
Philippines	Inpatient (incl. medicines)	Consultation and medicines at primary care facilities and hospital out-patient (donations accepted). Shortages mean medicines often purchased privately.	Poor qualify as charity patients and exempted from hospital charges. Shortages mean medicines must often be purchased.	Elderly >60
Sri Lanka	Family planning services. Patients occasionally asked to buy medicines / supplies.	All medical and medicines except family planning.	When charges made, staff generally exempt the poor informally.	None
Taiwan	All medical care and medicines. Fee schedule for outpatient care. For inpatient, co-payment of 10% (5% if chronic) if length-of-stay < 30 days, rate increases thereafter.	Family planning and vaccinations / immunisations.	Low income exempt from NHI co-payments	Residents of remote areas
Thailand	All medical care and medicines. After Oct 2001, fixed fee (30 Baht) scheme means very minimal co-payment.	Non-personal health care; EPI vaccination	Poor exempted from user fees and co-payments. Informally, those “unable to pay” are exempted.	children <12; elderly >60; public health volunteers; monks.
Vietnam	Fees for most services introduced in 1989. Medicines rarely provided free of charge.	Outpatient services at commune health centres.	Fee exemptions for individuals who have certification of indigency from neighbourhood or village People’s Committee.	Families of health personnel, certain classes of patients (like handicapped, TB), orphans.

Table 3: Variable definitions - Living standards and OOP health payments

	Household living standards		OOP health payments	
	Concept ^a	Period ^b	Services covered	Recall Period ^c
Bangladesh	Consumption	1 year	Fees, hospital/clinic charges, medicines, test/investigation, transport, tips and other health service charges.	1 month
China	Consumption	1 year	Inpatient, outpatient, medicines, etc	1 year
Hong Kong SAR	Expenditure	1 month	Inpatient, outpatient, medicines, traditional medicine, dental, medical supplies/equipment, health supplement, other health care.	Inpatient = 1 year; others = 2 weeks
India	Consumption	1 month	Fees, inpatient and outpatient hospital charges, medicines, tests, abortion, ambulance charge.	Inpatient = 1 year; others = 1 month
Indonesia	Consumption	1 month	Inpatient, outpatient, medicines / self-medication	Inpatient = 1 year; others = 1 month
Korea Rep.	Expenditure	1 month	Inpatient, outpatient, medicines, dental, medical supplies/equipment, tests	1 month
Kyrgyz Rep.	Expenditure	1 year	Inpatient, outpatient, medicines.	Inpatient = 1 year; others = 1 month
Malaysia	Consumption	1 year	Inpatient, outpatient (western & traditional), medicines, dental, medical supplies/equipment, tests	1 month
Nepal	Consumption	1 year	Fees (western & traditional), medicines (western & traditional), hospital expenses, tests.	1 month
Philippines	Consumption	1 year	Fees, hospital charges; medical and dental charges; medicines; other medical goods and supplies.	6 months
Sri Lanka	Consumption	1 year	Fees, hospital charges, medicines, tests, spectacles, dental, homeopathy and acupuncture, charms and others	1 month
Taiwan	Expenditure	1 year	Inpatient, outpatient, medicines, medical equipment, dental, nursing home, tests, traditional medicines, medical supplies.	1 year
Thailand	Consumption	1 month	Inpatient, outpatient, medicines, self-medication, traditional medicine	Inpatient = 1 year; others = 1 month
Vietnam	Consumption	1 year	Inpatient care costs plus total other amount paid in money and in-kind for diagnosing and treating illness and injury.	1 year

a. *Consumption* includes the value of goods consumed from household production and where feasible the use value of durables and implicit rental value of housing. *Expenditure* is the value of goods purchased for consumption.

b. Expenditures on different items are reported for different recall periods. The period given is the one for which total consumption / expenditure is computed.

c. All OOP payments are scaled to the same period used to compute total consumption / expenditure.

Table 4: OOP payments for health care as a percentage of household consumption (/expenditure)

	Bangladesh	China	Hong Kong	India	Indonesia	Korea Rep.	Kyrgyz Rep.	Malaysia	Nepal	Philippines	Sri Lanka	Taiwan	Thailand	Vietnam
<i>OOP payments as percentage of total household consumption (/expenditure)</i>														
Mean	5.10	4.11	2.29	4.84	1.83	3.83	2.40	1.37	2.77	1.94	2.11	3.74	1.71	5.49
Coefficient of variation	1.92	1.97	2.38	1.59	2.93	1.96	1.81	2.47	2.28	2.66	1.95	1.27	2.46	1.32
Median	1.15	2.33	0.17	2.17	0.00		0.60	0.18	1.15	0.41	0.91	2.35	0.40	2.94
Concentration index	0.2414	-0.0357	0.0480	0.1600	0.1618	0.0037	0.0986	0.1301	0.0781	0.1951	0.1117	-0.0467	0.1082	0.0270
<i>Quintile means</i>														
Poorest 20%	2.94	4.57	1.87	3.30	1.23	4.15	1.77	1.11	2.44	1.19	1.64	4.25	1.25	4.86
2nd poorest middle	3.17	5.27	2.27	4.41	1.46	3.42	1.96	1.10	2.71	1.60	1.82	3.85	1.48	5.44
2nd richest	4.55	5.39	2.25	5.23	1.69	3.61	2.59	1.14	2.90	1.84	2.00	3.68	1.71	5.74
Richest 20%	5.98	4.59	2.15	6.16	2.11	3.89	2.93	1.48	2.86	2.18	2.21	3.52	2.02	5.85
	8.86	3.45	2.67	6.48	2.69	4.08	2.77	2.00	3.64	2.93	2.86	3.38	2.07	5.57
<i>OOP payments as percentage of household non-food consumption (/expenditure)</i>														
Mean	10.66	5.92	3.36	10.72	4.18	5.31	7.48	2.13	9.15	4.18	5.32	4.63	2.93	12.64
Coefficient of variation	1.55	2.18	2.25	1.31	2.39	1.84	1.55	2.24	2.41	2.16	1.56	1.25	2.29	1.09
Median	3.20	5.26	0.24	5.76	0.00		1.88	0.28	4.08	1.03	2.47	2.89	0.71	7.31
Concentration index	0.1608	-0.1851	-0.0125	0.0870	0.0697	-0.0457	0.0783	0.0763	-0.0464	0.0773	0.0074	-0.0969	0.0166	-0.0536

Note: If sample weights exist, they are applied in computation of all statistics to give population estimates.

Table 5: Percentage of households incurring catastrophic payments for health care

		OOP payments as share of total household expenditure				OOP payments as share of non-food expenditure			
		threshold	5%	10%	15%	25%	15%	25%	40%
BANGLADESH	Headcount (H_C)		27.63%	15.57%	9.87%	4.49%	24.55%	14.73%	7.13%
	Concentration index (C_E)		0.1821	0.2332	0.2797	0.391	0.2123	0.3145	0.458
	Rank weighted headcount (WH)		22.60%	11.94%	7.11%	2.73%	19.33%	10.10%	3.86%
CHINA	Headcount (H_C)		28.37%	12.61%	7.01%	2.80%	21.05%	11.23%	4.81%
	Concentration index (C_E)		0.0103	-0.0078	0.0293	0.1597	-0.1147	-0.1202	-0.0334
	Rank weighted headcount (WH)		28.08%	12.71%	6.80%	2.36%	23.47%	12.58%	4.98%
HONG KONG	Headcount (H_C)		12.98%	5.86%	3.04%	1.09%	5.86%	2.46%	0.86%
	Concentration index (C_E)		0.0168	-0.0019	0.0935	0.1676	-0.0590	-0.0050	0.0875
	Rank weighted headcount (WH)		12.76%	5.87%	2.76%	0.91%	6.20%	2.47%	0.78%
INDIA	Headcount (H_C)		25.59%	10.84%	5.52%	1.83%	20.92%	9.76%	3.44%
	Concentration index (C_E)		0.0722	0.0915	0.1425	0.2780	0.0623	0.1213	0.2601
	Rank weighted headcount (WH)		23.74%	9.85%	4.73%	1.32%	19.62%	8.57%	2.54%
INDONESIA	Headcount (H_C)		9.57%	4.43%	2.59%	1.13%	8.28%	4.40%	1.95%
	Concentration index (C_E)		0.0978	0.2001	0.3006	0.4777	0.0822	0.1828	0.3590
	Rank weighted headcount (WH)		8.63%	3.54%	1.81%	0.59%	7.60%	3.60%	1.25%
KOREA REP.	Headcount (H_C)		20.94%	10.36%	6.11%	2.56%	9.79%	4.82%	1.85%
	Concentration index (C_E)		-0.0453	-0.0244	0.0011	0.0956	-0.0640	-0.0195	0.0860
	Rank weighted headcount (WH)		21.89%	10.61%	6.10%	2.32%	10.42%	4.91%	1.69%
KYRGYZ REP.	Headcount (H_C)		15.53%	5.84%	2.30%	0.50%	18.05%	9.29%	2.64%
	Concentration index (C_E)		0.1720	0.2097	0.2372	0.2372	0.1035	0.1210	0.1916
	Rank weighted headcount (WH)		12.86%	4.62%	1.75%	0.38%	16.18%	8.16%	2.13%

		OOP payments as share of total household expenditure				OOP payments as share of non-food expenditure		
threshold		5%	10%	15%	25%	15%	25%	40%
MALAYSIA	Headcount (H _C)	6.62%	2.01%	0.98%	0.36%	2.48%	0.78%	0.21%
	Concentration index (C _E)	0.0562	0.1633	0.3018	0.5238	0.0491	0.2123	0.5742
	Rank weighted headcount (WH)	6.25%	1.68%	0.68%	0.17%	2.36%	0.61%	0.09%
NEPAL	Headcount (H _C)	14.72%	5.90%	3.09%	1.18%	17.12%	9.24%	4.57%
	Concentration index (C _E)	0.1039	0.0320	0.0963	0.2193	-0.0743	-0.1125	-0.1415
	Rank weighted headcount (WH)	13.19%	5.71%	2.79%	0.92%	18.39%	10.28%	5.21%
PHILIPPINES	Headcount (H _C)	9.21%	4.60%	2.68%	1.14%	7.23%	3.81%	1.58%
	Concentration index (C _E)	0.1529	0.1952	0.2404	0.3755	0.1093	0.1526	0.2593
	Rank weighted headcount (WH)	7.80%	3.70%	2.04%	0.71%	6.44%	3.23%	1.17%
SRI LANKA	Headcount (H _C)	10.97%	2.98%	1.54%	0.47%	9.32%	3.40%	1.31%
	Concentration index (C _E)	0.1240	0.2368	0.3217	0.4845	-0.0549	-0.0207	-0.1036
	Rank weighted headcount (WH)	9.61%	2.27%	1.05%	0.24%	9.83%	3.47%	1.44%
TAIWAN	Headcount (H _C)	19.14%	6.35%	2.79%	0.87%	4.47%	1.49%	0.41%
	Concentration index (C _E)	-0.0124	-0.0245	-0.0534	-0.0872	-0.0347	-0.0738	-0.02328
	Rank weighted headcount (WH)	19.38%	6.50%	2.94%	0.95%	4.63%	1.60%	0.42%
THAILAND	Headcount (H _C)	8.43%	3.52%	1.92%	0.80%	4.54%	1.83%	0.71%
	Concentration index (C _E)	0.1230	0.2043	0.2693	0.3916	0.0566	0.1793	0.2002
	Rank weighted headcount (WH)	7.39%	2.80%	1.41%	0.49%	4.28%	1.50%	0.57%
VIETNAM	Headcount (H _C)	33.77%	15.11%	8.47%	2.89%	29.37%	15.10%	5.97%
	Concentration index (C _E)	-0.0315	0.0270	0.0971	0.2955	-0.1299	-0.1020	-0.0116
	Rank weighted headcount (WH)	34.84%	14.70%	7.65%	2.03%	33.19%	16.64%	6.04%

Table 6: Intensity (overshoot) of catastrophic OOP payments for health care

	threshold	Share of total consumption/expenditure				Share of non-food consumption/expenditure		
		5%	10%	15%	25%	15%	25%	40%
BANGLADESH	Overshoot (O)	3.04%	2.02%	1.40%	0.72%	4.74%	2.83%	1.26%
	Mean positive overshoot (MPO)	11.01%	12.98%	14.15%	16.07%	19.32%	19.22%	17.70%
	Concentration index (C _O)	0.3299	0.3915	0.4528	0.567	0.3844	0.4667	0.592
	Rank weighted overshoot (WO)	2.04%	1.23%	0.76%	0.31%	2.92%	1.51%	0.51%
CHINA	Overshoot (O)	2.22%	1.28%	0.81%	0.35%	3.39%	1.86%	0.73%
	Mean positive overshoot (MPO)	7.84%	10.12%	11.52%	12.38%	16.09%	16.57%	15.24%
	Concentration index (C _O)	0.0639	0.1056	0.1631	0.2594	-0.0697	-0.0265	0.0653
	Rank weighted overshoot (WO)	2.08%	1.14%	0.68%	0.26%	3.62%	1.91%	0.69%
HONG KONG	Overshoot (O)	0.98%	0.55%	0.34%	0.13%	0.73%	0.34%	0.11%
	Mean positive overshoot (MPO)	7.56%	9.40%	11.08%	12.06%	12.40%	13.66%	12.76%
	Concentration index (C _O)	0.0854	0.1410	0.2052	0.3140	0.0237	0.0762	0.1719
	Rank weighted overshoot (WO)	0.90%	0.47%	0.27%	0.09%	0.71%	0.31%	0.09%
INDIA	Overshoot (O)	1.77%	0.92%	0.53%	0.20%	2.80%	1.35%	0.45%
	Mean positive overshoot (MPO)	6.91%	8.49%	9.65%	11.03%	13.39%	13.83%	12.96%
	Concentration index (C _O)	0.1449	0.2080	0.2788	0.4144	0.1609	0.2451	0.3915
	Rank weighted overshoot (WO)	1.51%	0.73%	0.38%	0.12%	2.35%	1.02%	0.27%
INDONESIA	Overshoot (O)	0.83%	0.51%	0.34%	0.17%	1.38%	0.77%	0.32%
	Mean positive overshoot (MPO)	8.71%	11.48%	13.09%	14.64%	16.68%	17.62%	16.64%
	Concentration index (C _O)	0.3125	0.4208	0.5069	0.6367	0.2688	0.3770	0.5391
	Rank weighted overshoot (WO)	0.57%	0.29%	0.17%	0.06%	1.01%	0.48%	0.15%
KOREA	Overshoot (O)	1.90%	1.16%	0.76%	0.36%	1.42%	0.73%	0.27%
	Mean positive overshoot (MPO)	9.07%	11.23%	12.48%	13.94%	14.52%	15.20%	14.82%
	Concentration index (C _O)	0.0325	0.0778	0.1263	0.2302	0.0233	0.0916	0.2073
	Rank weighted overshoot (WO)	1.84%	1.07%	0.67%	0.28%	1.39%	0.66%	0.22%

	threshold	Share of total consumption/expenditure				Share of non-food consumption/expenditure		
		5%	10%	15%	25%	15%	25%	40%
KYRGYZ REP.	Overshoot (O)	0.84%	0.35%	0.15%	0.04%	2.38%	1.06%	0.28%
	Mean positive overshoot (MPO)	5.44%	6.02%	6.71%	7.46%	13.19%	11.44%	10.70%
	Concentration index (C _O)	0.1224	0.1938	0.2039	0.2830	0.0851	0.1120	0.1192
	Rank weighted overshoot (WO)	0.74%	0.28%	0.12%	0.03%	2.18%	0.94%	0.25%
MALAYSIA	Overshoot (O)	0.36%	0.17%	0.10%	0.05%	0.24%	0.10%	0.03%
	Mean positive overshoot (MPO)	5.39%	8.58%	10.58%	13.15%	9.62%	12.46%	14.82%
	Concentration index (C _O)	0.2542	0.4204	0.5370	0.7232	0.2641	0.4730	0.7388
	Rank weighted overshoot (WO)	0.27%	0.10%	0.05%	0.01%	0.18%	0.05%	0.01%
NEPAL	Overshoot (O)	1.11%	0.64%	0.43%	0.24%	4.35%	3.11%	2.15%
	Mean positive overshoot (MPO)	7.54%	10.85%	13.88%	20.59%	25.42%	33.66%	47.15%
	Concentration index (C _O)	0.0579	0.0474	0.0475	-0.0418	-0.2368	-0.2949	-0.3695
	Rank weighted overshoot (WO)	1.06%	0.61%	0.41%	0.25%	5.38%	4.02%	2.94%
PHILIPPINES	Overshoot (O)	0.82%	0.50%	0.32%	0.14%	1.15%	0.62%	0.24%
	Mean positive overshoot (MPO)	8.94%	10.81%	12.01%	12.68%	15.89%	16.36%	15.36%
	Concentration index (C _O)	0.2766	0.3427	0.4089	0.5429	0.2055	0.2674	0.3819
	Rank weighted overshoot (WO)	0.60%	0.33%	0.19%	0.07%	0.91%	0.46%	0.15%
SRI LANKA	Overshoot (O)	0.56%	0.27%	0.16%	0.07%	0.97%	0.42%	0.15%
	Mean positive overshoot (MPO)	5.09%	8.89%	10.41%	15.56%	10.74%	13.70%	15.05%
	Concentration index (C _O)	0.2969	0.4412	0.5553	0.7575	0.1064	0.2376	0.4258
	Rank weighted overshoot (WO)	0.39%	0.15%	0.07%	0.02%	0.87%	0.32%	0.08%
TAIWAN	Overshoot (O)	1.03%	0.47%	0.26%	0.10%	0.45%	0.18%	0.06%
	Mean positive overshoot (MPO)	5.40%	7.46%	9.39%	11.79%	9.97%	12.07%	14.04%
	Concentration index (C _O)	-0.0293	-0.0457	-0.0528	-0.0421	-0.0442	-0.0430	-0.0088
	Rank weighted overshoot (WO)	1.06%	0.50%	0.28%	0.11%	0.47%	0.19%	0.06%

	threshold	Share of total consumption/expenditure				Share of non-food consumption/expenditure		
		5%	10%	15%	25%	15%	25%	40%
THAILAND	Overshoot (O)	0.61%	0.33%	0.20%	0.07%	0.55%	0.26%	0.08%
	Mean positive overshoot (MPO)	7.25%	9.39%	10.41%	9.05%	12.22%	14.22%	11.13%
	Concentration index (C _O)	0.2474	0.3337	0.3907	0.5349	0.1508	0.1970	0.2172
	Rank weighted overshoot (WO)	0.02%	0.01%	0.01%	0.00%	0.47%	0.21%	0.06%
VIETNAM	Overshoot (O)	2.53%	1.39%	0.81%	0.30%	4.35%	2.24%	0.76%
	Mean positive overshoot (MPO)	7.48%	9.18%	9.58%	10.46%	14.81%	14.83%	12.66%
	Concentration index (C _O)	0.0960	0.1845	0.2821	0.4594	-0.0681	-0.0197	0.0809
	Rank weighted overshoot (WO)	2.28%	1.13%	0.58%	0.16%	4.65%	2.28%	0.69%

Table 7: Poverty impact of OOP payments – Poverty headcounts

Poverty line	\$1.08 per day					\$2.15 per day				
	(1) Pre- payment headcount	(2) Post- payment headcount	Change in poverty headcount			(6) Pre- payment headcount	(7) Post- payment headcount	Change in poverty headcount		
			(3) percentage point change	(4) Number of individuals	(5) percentage change			(8) percentage point change	(9) Number of individuals	(10) percentage change
BANGLADESH	22.48%	26.25%	3.77%	4940585	16.77%	72.97%	76.52%	3.55%	4653875	4.87%
CHINA	13.65%	16.21%	2.57%	32431209	18.83%	44.60%	46.44%	1.84%	23198460	4.12%
INDIA	31.10%	34.80%	3.70%	37358760	11.91%	80.34%	82.39%	2.05%	20638361	2.55%
INDONESIA	7.91%	8.59%	0.68%	1440395	8.66%	58.23%	59.89%	1.66%	3493767	2.85%
KYRGYZ REP.	2.62%	2.74%	0.12%	5989	4.66%	32.19%	34.12%	1.93%	94793	5.99%
MALAYSIA	1.02%	1.07%	0.05%	10562	4.44%	11.84%	12.09%	0.25%	58626	2.13%
NEPAL	39.31%	41.55%	2.24%	515933	5.70%	80.39%	81.65%	1.26%	290280	1.57%
PHILIPPINES	15.84%	16.43%	0.59%	445680	3.72%	50.15%	51.19%	1.05%	790333	2.09%
SRI LANKA	3.76%	4.07%	0.31%	60116	8.26%	39.07%	40.75%	1.68%	325783	4.31%
THAILAND	2.09%	2.25%	0.17%	100201	7.91%	24.23%	24.92%	0.69%	417626	2.84%
VIETNAM	3.71%	4.91%	1.20%	943725	32.39%	36.31%	40.98%	4.67%	3665762	12.86%
TOTAL	19.27%	21.97%	2.70%	78253155	14.01%	58.77%	60.76%	1.99%	57627666	3.38%

Notes: Column (3)=(2)-(1). Column (4)=(3)*population. Column (5)=(3)/(1).

Table 8: Least squares regression for poverty impact

Dependent variable: Percentage point change in poverty headcount

	Coefficient	Standard error	p-value
OOP financing share (%)	0.0333	.0227	0.1810
Pre-payment headcount (%)	0.0592	.0280	0.0680
constant	-1.3033	1.1571	0.2930
	N=11	Adjusted R ² = 0.6029	F statistic (2,8)=8.59, p=0.0102

Table 9: Poverty impact of OOP payments – Poverty gaps

Poverty line	\$1.08 per day				\$2.15 per day			
	(1)	(2)	Change in normalised poverty gap		(5)	(6)	Change in normalised poverty gap	
	Pre-payment normalised gap	Post-payment normalised gap	(3) percentage point change	(4) percentage change	Pre-payment normalised gap	Post-payment normalised gap	(7) percentage point change	(8) percentage change
BANGLADESH	4.46%	5.29%	0.83%	18.62%	27.84%	30.45%	2.61%	9.36%
CHINA	3.31%	4.08%	0.77%	23.32%	16.72%	17.96%	1.23%	7.36%
INDIA	6.74%	7.73%	1.00%	14.78%	33.87%	35.92%	2.04%	6.03%
INDONESIA	1.19%	1.32%	0.12%	10.34%	17.30%	18.11%	0.81%	4.66%
KYRGYZ REP.	0.38%	0.43%	0.05%	13.49%	7.37%	7.96%	0.59%	8.04%
MALAYSIA	0.19%	0.21%	0.01%	5.92%	2.84%	2.92%	0.08%	2.96%
NEPAL	10.76%	11.66%	0.90%	8.36%	37.38%	38.66%	1.29%	3.45%
PHILIPPINES	3.85%	4.02%	0.17%	4.36%	19.27%	19.80%	0.54%	2.78%
SRI LANKA	0.66%	0.71%	0.05%	7.50%	10.08%	10.62%	0.54%	5.31%
THAILAND	0.41%	0.42%	0.01%	3.47%	6.12%	6.37%	0.26%	4.18%
VIETNAM	0.64%	0.83%	0.19%	29.99%	9.25%	10.94%	1.69%	18.28%

Notes: Column (3)=(2)-(1). (4)=(3)/(1).

Appendix

Table A1: Description of surveys

Territory	Year	Survey	Survey institution	National coverage	Survey design	Sampling unit	Response rate	Sample size
Bangladesh	1999-2000	Household Income Expenditure Survey	Bangladesh Bureau of Statistics	Nationally representative	Stratified, cluster sampling. Weights applied.	Household	100%	7,440
China	2000	Sub-sample of Urban/ Rural Household Survey	National Bureau of Statistics	Original survey nation representative. Analytical sample randomly selected from all hholds in 10 provinces.	Stratified, Weights applied.	Household	100%	9700 (from total survey of 85,000)
Hong Kong SAR	1999-2000	Household Expenditure Survey (HES)	Census & Statistics Department, Government of HK SAR	All land domestic households, except those receiving welfare.	Stratified. Weights applied.	Household	79.50%	6116
		HES on CSSA ^a (welfare) households	as above	All CSSA (welfare) cases, with some exceptions ^b	Stratified. Weights applied	Household	95.50%	1510
India	1999-2000	National Sample Survey, 55 th round	National Sample Survey Organisation	Nationally representative	Stratified, sample weights applied.	Household	100%	120,039
Indonesia	2001	Socioeconomic Survey (SUSENAS)	National Board of Statistics	Nationally representative	Stratified, cluster sampling. Self-weighted	Household	98%	218,568
Korea Rep.	2000	Urban Household Survey	National Statistical Office	Urban only (78.5% of population)	Stratified, cluster sampling.	District, then household	82%	62,632

Territory	Year	Survey	Survey institution	National coverage	Survey design	Sampling unit	Response rate	Sample size
Kyrgyz Rep.	2000-01	Household Budget Survey	National Statistical Committee	Nationally representative	Stratified, sample weights applied.	Household	>90%	3000
Malaysia	1998/99	Household Expenditure Survey	Government Dept of Statistics	Nationally representative	Stratified, sample weights applied.	Household	82%	9198
Nepal	1995-96	Living Standards Survey	Central Bureau of Statistics	Nationally representative	Stratified, cluster sample. Weights applied	Household	99.6%	3,388
Philippines	1999	Poverty Indicator Survey	National Statistics Office	Nationally representative	Stratified	Household	100%	37,454
Sri Lanka	1996-1997	Consumer Finance Survey	Central Bank of Sri Lanka	Excluded Northern Province due to civil war.	Stratified. Weights applied	Household	98%	8,880
Taiwan	2000	Survey of Family Income and Expenditure	DG of Budget, Accounting and Statistics, Office of Statistics (DGBAS)	Nationally representative	Stratified, cluster sampling. Weights applied.	City/county then household	100%	13801
Thailand	2002	Socio-economic Survey	National Statistical Office	Nationally representative	Stratified, weights applied	Household	93%	17,489
Vietnam	1998	Living Standards Survey	Govt of Vietnam and World Bank	Nationally representative	Stratified, weights applied Stratified, cluster sampling. Weights applied.	Household	99%	5999

Notes:

- a. Comprehensive Social Security Assistance. For CSSA household members not on CSSA, expenditure estimate at 25 percentile of HES sample of same household size and housing type.
- b. Covers 99% of CSSA families and 65% of CSSA single persons.

References

- Akin, J., W. H. Dow, et al. (2004). "Did the distribution of health insurance in China continue to grow less equitable in the nineties? Results from a longitudinal survey." Social Science & Medicine **58**: 293-304.
- Banerjee, A., A. Deaton, et al. (2004). "Health care delivery in rural Rajasthan." Economic and Political Weekly: 944-49.
- Berki, S. E. (1986). "A look at catastrophic medical expenses and the poor." Health Affairs: 138-145.
- Bloom, G. and X. Gu (1997). "Health sector reform: Lessons from China." Social Science & Medicine **45**(3): 351-360.
- Bonu, S., M. Rani, et al. (2005). "Does use of tobacco or alcohol contribute to impoverishment from hospitalization costs in India?" Health Policy and Planning **20**(1): 41-49.
- Carrin, G., R. Aviva, et al. (1997). "The reform of the rural cooperative medical system in the People's Republic of China: Interim experience in 14 pilot counties." Social Science & Medicine **48**(7): 961-972.
- Chang, F.-R. and P. K. Trivedi (2003). "Economics of self-medication: Theory and evidence." Health Economics.
- Chen, S. and M. Ravallion (2001). "How did the world's poorest fare in the 1990s?" Review of Income and Wealth **47**(3): 283-300.
- Chen, S. and M. Ravallion (2004). "How have the world's poorest fared since the early 1980s?" World Bank Research Observer **19**(2): 141-69.
- Cirto, C. and R. Michael (1995). Measuring poverty: A new approach. Washington DC, National Academy Press.
- Cogan, J. (1995). Appendix A - Dissent. Measuring Poverty: An alternative approach. C. Cirto and R. Michael. Washington, DC, National Academy Press: 385-390.
- Commission on Macroeconomics and Health (2001). Macroeconomics and Health: Investing in health for economic development. Geneva, World Health Organisation.
- Data International Ltd. (2004). Bangladesh National Health Accounts, 1999-2001. Dhaka, Health Economics Unit, Ministry of Health and Family Welfare.
- Deaton, A. (2003). "Adjusted Indian Poverty Estimates for 1999-00." Economic and Political Weekly **38**(4): 322-26.
- Deaton, A. (2004). Measuring poverty in a growing world (or measuring growth in a poor world). Princeton University. Princeton, NJ.
- Ensor, T. and B. S. Pham (1996). "Access and payment for health care: The poor of northern Vietnam." International Journal of Health Planning and Management **11**: 69-83.
- Fabricant, S. J., C. W. Kamara, et al. (1999). "Why the poor pay more: Household curative expenditures in rural Sierra Leone." International Journal of Health Planning and Management **14**: 179-199.
- Gertler, P. and J. Gruber (2002). "Insuring consumption against illness." American Economic Review **92**(1): 51-70.
- Gustaffson, B. and S. LI (2004). "Expenditures on education and health care and poverty in rural China." China Economic Review **15**: 292-301.
- Henderson, G., S. Jin, et al. (1995). "The distribution of medical insurance in China." Social Science & Medicine **41**(8): 1119-1130.

- Hotchkiss, D. R., J. J. Rous, et al. (1998). "Household health expenditures in Nepal: implications for health care financing reform." Health Policy and Planning **13**(4): 371-83.
- Kawabata, K., K. Xu, et al. (2002). "Preventing impoverishment through protection against catastrophic expenditure." Bulletin of the World Health Organisation **80**: 612.
- Khoman, S. (1997). Rural health care financing in Thailand. Innovations in health care financing: Proceedings of a World Bank Conference, March 10-11, 1997. G. J. Schieber. Washington DC, The World Bank: 183-93.
- Krishna, A. (2004). "Escaping Poverty and Becoming Poor: Who Gains, Who Loses, and Why?" World Development **32**(1): 121-136.
- Lui, Y., K. Rao, et al. (2003). "Medical expenditure and rural impoverishment in China." Journal of Health, Population and Nutrition **21**(3): 216-222.
- Meesen, B., Z. Zang, et al. (2003). "Iatrogenic Poverty." Tropical Medicine and International Health **8**(7): 581-584.
- Mudur, G. (1999). "Abuse of OTC drugs rising in South Asia." British Medical Journal **318**: 556.
- Narayan, D., Ed. (2000). Voices of the Poor. Can anyone hear us? Oxford, OUP/World Bank.
- O'Donnell, O., E. Van Doorslaer, et al. (2005). Who pays for health care in Asia? EQUITAP Working Paper # 1, Erasmus University, Rotterdam and IPS, Colombo.
- O'Donnell, O., E. van Doorslaer, et al. (2005). Who benefits from public spending on health care in Asia? EQUITAP Working Paper #3, Erasmus University, Rotterdam and IPS, Colombo.
- O'Donnell, O., E. van Doorslaer, et al. (2005). Explaining the incidence of catastrophic expenditures on health care: Comparative evidence from Asia. EQUITAP Working Paper #5, Erasmus University, Rotterdam and IPS, Colombo.
- OECD and WHO (2003). DAC Guidelines and Reference Series - Poverty and Health. Paris, OECD and WHO.
- Pannarunothai, S. and A. Mills (1997). "The poor pay more: health-related inequality in Thailand." Soc Sci Med **44**(12): 1781-90.
- Peters, D., A. Yazbeck, et al. (2001). Better health systems for India's poor. Findings, analysis and options. Washington DC, World Bank.
- Pradhan, M. and N. Prescott (2002). "Social risk management options for medical care in Indonesia." Health Economics **11**: 431-446.
- Ranson, M. K. (2002). "Reduction of catastrophic health care expenditures by a community-based health insurance scheme in Gujarat, India: current experiences and challenges." Bulletin of the World Health Organisation **80**(8): 613-21.
- Ravallion, M. (1998). Poverty lines in theory and practice. Washington, DC, World Bank.
- Ravallion, M., S. Chen, et al. (1996). What can new survey data tell us about recent changes in distribution and poverty? Washington, DC, World Bank Policy Research Dept. Poverty and Human Resources Divisions.
- Ravallion, M., G. Datt, et al. (1991). "Quantifying absolute poverty in the developing world." Review of Income and Wealth **37**: 345-361.
- Russell, S. (2004). "The economic burden of illness for households in developing countries: a review of studies focusing on malaria, tuberculosis, and human

- immunodeficiency virus/acquired immunodeficiency syndrome." American Journal of Tropical Medicine and Hygiene **71**(Supp. 2): 147-155.
- Saadah, F., M. Pradhan, et al. (2001). The effectiveness of the Health Card as an instrument to ensure access to medical care for the poor during the crisis. World Bank. Washington DC.
- Sauerbron, R., A. Adams, et al. (1996). "Household strategies to cope with the economic cost of illness." Social Science & Medicine **43**(3): 291-301.
- Sauerbron, R., I. Ibrangho, et al. (1995). "The economic costs of illness for rural households in Burkina Faso." Tropical Med. & Parasitol **42**: 219.
- Segall, M., G. Tipping, et al. (2002). "Economic transition should come with a health warning: the case of Vietnam." Journal of Epidemiology and Community Health **56**: 497-505.
- Short, K. and T. Garner (2002). "Experimental poverty measures: Accounting for medical expenditures." Monthly Labor Review: 3-13.
- Short, K., T. Garner, et al. (1999). Experimental Poverty Measures: 1990 to 1997. U.S. Census Bureau, Current Population Reports, Consumer Income, P60-205. Washington DC, U.S. Government Printing Office.
- Skarbinski, J., H. K. Walker, et al. (2002). "The burden of out-of-pocket payments for health care in Tblisi, Republic of Georgia." Journal of American Medical Association **287**(8): 1043-49.
- Somanathan, A., O. O'Donnell, et al. (2005). Who gets health care in Asia? EQUITAP Working Paper # 4, Erasmus University, Rotterdam and IPS, Colombo.
- van Damme, W. (2004). "Out-of-pocket health expenditure and debt in poor households: evidence from Cambodia." Tropical Medicine and International Health **9**(2): 273-80.
- Wagstaff, A. and M. Pradhan (2003). Evaluating the impacts of health insurance: looking beyond the negative. World Bank Health Nutrition and Population. Washington DC.
- Wagstaff, A. and E. Van Doorslaer (2003). "Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993-98." Health Economics **12**: 921-934.
- Whitehead, M., G. Dahgren, et al. (2001). "Equity and health sector reforms: can low-income countries escape the medical poverty trap?" The Lancet **358**: 833-36.
- Wilkes, A., H. Y., et al. (1998). Coping with the costs of severe illness in rural China. IDS Working Paper 58. Brighton, Sussex, UK.
- World Bank (2001). Growing healthy? A review of Vietnam's health sector. Hanoi, The World Bank.
- World Bank (2004). The Millenium Development Goals for Health: Rising to the challenges. Washington DC, World Bank.
- Wyszewianski, L. (1986). "Financially catastrophic and high cost cases: Definitions, distinctions and their implications for policy formulation." Inquiry **23**(4): 382-94.
- Xu, K., D. E. Evans, et al. (2003). "Household catastrophic health expenditure: a multicountry analysis." Lancet **362**: 111-17.

Notes

¹ Payments for medicines prescribed at public sector facilities are included.

² See also unpublished reports cited by (Fabricant, Kamara et al. 1999), that are also usually specific to one rural region.

³ For evidence on strategies households adopt to finance medical expenditures see (Ensor and Pham 1996; Sauerbron, Adams et al. 1996; Wilkes, Y. et al. 1998; Peters, Yazbeck et al. 2001; Skarbinski, Walker et al. 2002; van Damme 2004; Bonu, Rani et al. 2005).

⁴ Researchers at the World Health Organisation (Xu, Evans et al. 2003) set the threshold at 40% of *capacity to pay*, defined as *non-subsistence effective income*. This is household expenditure net of the estimated cost of subsistence food needs. Subsistence spending on food is defined as the average food expenditure of households in the 45th-50th percentile of the food budget share distribution. Since the food budget share is declining with the total budget, this will roughly correspond to the food expenditure of those with median welfare (taking food share a money metric indicator of utility). Actual food expenditure is used for those spending less than this value. We prefer to avoid the problem of estimating subsistence food needs and keep the analysis more transparent by referring to OOP as a share of total and of non-food expenditure.

⁵ We have computed standard errors for all point estimates but do not give them in the tables. With large samples, the simple parameters of interest are estimated with a high degree of precision. Presentation of standard errors would clutter the tables to little advantage.

⁶ There are some apparent inconsistencies between our estimates of the catastrophic payment headcount at 40% of non-food expenditure and those of (Xu, Evans et al. 2003) at 40% of capacity to pay. The respective figures are as follows, with the WHO estimates in parentheses: Bangladesh - 7.13% (1.21%); Indonesia - 1.95% (1.26%); South Korea - 1.85% (1.73%); Kyrgyz - 2.64% (0.62%); Philippines - 1.58% (0.78%); Sri Lanka - 1.31% (1.25%); Thailand - 0.71% (0.80%); Vietnam - 5.97% (10.45%). Since (Xu, Evans et al. 2003) define capacity to pay as the smaller of estimated subsistence food needs and actual food expenditure, our estimates should always be greater than theirs. Clearly this does not hold for Vietnam and, to a lesser extent, Thailand. Our estimates of the headcount are, in a relative sense, much higher for Bangladesh and the Philippines.

⁷ Using 1995 SUSENAS data (Pradhan and Prescott 2002) find that 8.6% of households exceed the threshold of 10% of total expenditure. We find the percentage to be 4.4% using the 2001 SUSENAS. The economic crisis in Indonesia (1997-8) could be responsible for this change. With a very substantial increase in poverty, the share of resources going to food and shelter will have increased.

⁸ Such weighting obviously introduces normative judgements with respect to relative societal tolerance of catastrophic payments incurred at different points in the income distribution. This is inevitable in any attempt to summarise both the level and the distribution of some variable in one statistic. Without wishing to claim that the specific weighting scheme adopted reflects a social consensus, we suggest that the majority would wish to place more weight on catastrophic payments incurred by poorer households.

⁹ The variability and unpredictability of medical expenditures makes it extremely difficult to incorporate them in a poverty line.

¹⁰ A National Academy of Sciences Panel made this recommendation as the appropriate approach to measuring poverty in the US ((Cirtio and Michael 1995) Alternative estimates of U.S. poverty based on the approach are available ((Short, Garner et al. 1999); (Short and Garner 2002)

¹¹ (Cogan 1995) criticises the NAS Panel recommendation on the grounds that medical expenditures are not non-discretionary. He does, however, make a case for the inclusion of health care needs in the poverty line.

¹² (Wagstaff and Pradhan 2003) do estimate the impact that the extension of health insurance cover in Vietnam had on poverty through the reduction in OOP payments for health care.

¹³ Although poverty is assessed on the basis of a household's (per capita) resources, the poverty headcount is of individuals.

¹⁴ Using a relative poverty line, defined at one third of mean total expenditure, there is still little poverty impact of OOP health payments in Hong Kong, South Korea and Taiwan as a result of the near proportionality of payments. In South Korea, there is a substantial effect on poverty defined at the national poverty line. The rate rises from 10.83% pre-payment to 12.53% post-payment.

¹⁵ World Bank estimates of poverty rates can be obtained using Povcal (<http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp>). Their estimates of \$1.08 per day poverty headcounts are as follows (any difference in survey indicated and year indicated where differs from that of present study): Bangladesh -26.8%; China (2001) - 16.6%; India - 34.8%; Indonesia (2002) - 7.51%; Kyrgyz Rep. – 2.0%; Malaysia (different survey, 1997) – 0.17%; Nepal – 39.1%; the Philippines (different survey, 2000) – 15.5%; Sri Lanka (different survey, 1995-6) – 6.6%; Thailand (2000) - 1.9%; Vietnam – 3.8%.

¹⁶ Regressing the relative change in poverty on the OOP financing share and the initial poverty level gives a significant positive coefficient on the former ($b=0.5539$, $t=3.92$, $p=0.004$) and a negative coefficient on the latter ($b=-0.4954$, $t=-2.84$, $p=0.022$).