

## Who pays for health care in Asia?

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### Abstract

We estimate the distributional incidence of health care financing in 13 Asian territories that account for 55% of the Asian population. In all territories, higher-income households contribute more to the financing of health care. The better-off contribute more as a proportion of ability to pay in most low- and lower-middle-income territories. Health care financing is slightly regressive in three high-income economies with universal social insurance. Direct taxation is the most progressive source of finance and is

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most so in poorer economies. In universal systems, social insurance is proportional to regressive. In high-income economies, the out-of-pocket (OOP) payments are proportional or regressive while in low-income economies the better-off spend relatively more OOP. But in most low-/middle-income countries, the better-off not only pay more, they also get more health care.

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## 1. Introduction

The distribution of the health care financing burden has been estimated for European countries and the United States (Wagstaff and Van Doorslaer, 1992; Wagstaff et al., 1999). Until now, there was no such evidence for Asia. This paper fills that gap. It presents the first comprehensive and consistent analysis of the distribution of health care financing contributions in relation to ability to pay in 13 territories that account for 55% of the total population of Asia (33% of the world population). In contrast to earlier research that was concerned only with the high-income economies of Western Europe and the US, this study spans the whole range of development, from Nepal to Japan. This allows consideration not only of whether the findings from the earlier research on the incidence of different sources of health care finance carry over to the high-income economies of Asia, but also whether, for these countries, incidence varies with the level of development.

Equity in health care financing may be judged with respect to its consequences for two distributions—health and income. The distribution of health may be affected through financial disincentives to the utilisation of health care. The distribution of income may be altered by taxes and social insurance contributions. Living standards may also be disrupted by direct payments for health care that diminish household resources available to meet demand for other goods. In publicly financed health care systems with wide coverage, such as those found in Europe and in the high-income Asian economies included in this study, utilisation of health care, to a large extent, is not contingent on payment. Then, the impact on the distribution of income is the only equity issue concerning health finance. The distribution of health financing contributions can be examined and given an equity, or redistribution, interpretation. This was the logic of previous analyses of equity in health financing that considered the distribution of payments separate from that of utilisation (Wagstaff and Van Doorslaer, 1992; Wagstaff et al., 1999). When direct payments for health care contribute a substantial share of health care finance, as is the case in the low-/middle-income countries included in this study, the first equity issue remains. Payments may deter use, with possibly different effects on the rich and the poor (Gertler et al., 1987; Gertler and Van der Gaag, 1990; Mocan et al., 2004). Assessment of equity in health care financing then requires examination of the distribution of health care utilisation in addition to that of payments, as is done in this paper.

A number of interesting results emerge from the analysis. Incidence in the high-income economies with universal systems financed from taxation (Hong Kong SAR) or social insurance (Japan, Korea and Taiwan) is similar to that in the European countries examined in the earlier studies (Wagstaff and Van Doorslaer, 1992; Wagstaff et al., 1999). Tax finance is most progressive. Social insurance is slightly regressive and direct payments are proportional (Hong Kong and Korea) or regressive (Japan and Taiwan). Utilisation of health care is concentrated on the poor. Incidence is quite different in the low-/middle-income countries. Tax finance is even more progressive, reflecting the narrower tax base. Social insurance is progressive due to its partial coverage. Except in China and Kyrgyz, direct payments are progressive. That is, relative to ability to pay, the better-off make more direct payments for health care than the poor. This is not true in high-income countries, where direct payments are typically regressive, and it also contradicts evidence from less representative studies in low-income countries (e.g. Ensor and Pham, 1996; Pannarunothai and Mills, 1997; Fabricant et al., 1999; Segall et al., 2002). But not only do the poor pay less, they also get less health care, suggesting that they cannot afford to pay and so go without health care.

The paper is structured as follows. The next section summarises the health care financing mix in each territory. Data and methods are discussed in Section 3. The distributions of each of the main sources of finance are presented in Section 4. Estimates of distributions of health care utilisation are presented in Section 5. The final section summarises the results and considers their interpretation.

Table 1  
National income and health care financing mix

Territory (year)	Gross National Income per capita, 2000 (US\$)	Percentage of total health expenditure financed from main sources (%)						
		Public finance				Private finance		Other
		General government revenue <sup>a</sup>			Social insurance	Private insurance	Direct payments	
		Direct tax	Indirect tax	Non-tax				
Bangladesh (1999)	370	4.0	16.3	6.9	0.0	0.0	64.6	8.1 <sup>b</sup>
China (2000)	840	2.2	11.8	0.9	16.5	0.0	60.4	8.2 <sup>c</sup>
Hong Kong, SAR (1999–2000)	25,920	26.7	12.3	16.5	0.0	12.3	31.2	0.9
Indonesia (2001) <sup>d</sup>	570	11.9	8.5	12.6	2.9	6.4	57.7	0.0
Japan (2001)	35,620	19.5	12.6	1.0	54.0	0.0	12.8	0.0
Korea Rep. (2000)	8,960	8.3	7.9	0.0	33.9	0.0	49.9	0.0
Kyrgyz Rep. (2000)	280	6.2	28.3	10.0	3.8	0.0	51.7	0.0
Nepal (1995–1996) <sup>e</sup>	240	2.6	9.3	11.6	0.0	0.0	75.0	1.5 <sup>f</sup>
Philippines (1999)	1,040	16.9	14.8	8.0	5.1	10.3	44.9	0.0
Punjab (1995–1996)	537	2.0	14.0	24.7	1.3	0.2	56.4	1.3 <sup>g</sup>
Sri Lanka (1996–1997)	850	10.5	32.2	6.8	0.0	0.9	49.6	0.0
Taiwan (2000)	14,188	5.6	3.2	0.4	51.8	8.9	30.2	0.0
Thailand (2000)	2,010	16.4	27.7	12.2	5.1	5.9	32.7	0.0

Sources: GNI (Atlas method)—World Development Indicators, World Bank (<http://devdata.worldbank.org/data-query/>). Finance mix—National/Regional Health Accounts unless stated otherwise.

<sup>a</sup> Includes revenues from donors/foreign aid.

<sup>b</sup> Private enterprise, NGOs and community health insurance.

<sup>c</sup> Payments by collective organisations, towns and villages through grass roots governments and rural cooperatives.

<sup>d</sup> Ministry of Health preliminary NHA estimates revised from Public Health Expenditure Review.

<sup>e</sup> Public finance data for 1994–5 (HMG/Nepal, 2000), private expenditure data from 1995 to 1996 Nepal Living Standards Survey (Hotchkiss et al., 1998).

<sup>f</sup> Private companies.

<sup>g</sup> Revenue from private firms and NGOs for finance of own facilities.

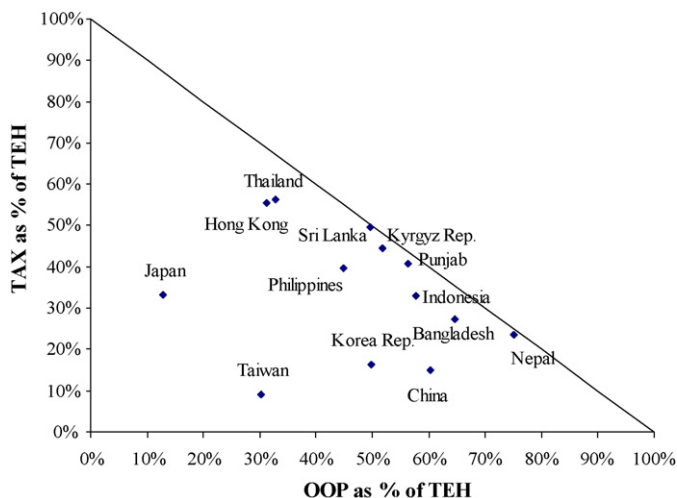


Fig. 1. Finance from out-of-pocket payments (OOP) and general government revenues (TAX) as a percentage of total expenditure on health (TEH). Note: Countries do not lie on the hypotenuse since, besides general government revenues and out-of-pocket payments, total expenditure on health is financed from social and private insurance and other sources, such as private enterprise, NGOs, community health insurance. Sources: as Table 1.

## 2. Health care financing mix

In Table 1, we give the percentage of total expenditure on health (TEH) financed from each of the main sources. With the exceptions of Nepal and Indonesia, these figures are derived from official health accounts estimates. For Nepal, we use an independent study of health financing (Hotchkiss et al., 1998), and in the case of Indonesia, we rely on preliminary health accounts estimates produced by the Ministry of Health together with figures from the Public Health Expenditure Review. National health accounts are not currently available for all of India, and our analysis is restricted to one state (Punjab) where health accounts estimates are available.

Private insurance plays a relatively minor role in most of the health systems considered. It contributes a non-negligible share of TEH only in Hong Kong, Indonesia, the Philippines, Taiwan and Thailand. Even in these cases the share is 10% or less. Consequently, the main distinguishing factor in these health financing systems is the balance between public pre-payment (tax and social insurance) and out-of-pocket (OOP) payment. The latter accounts for at least 30% of TEH in all territories except Japan. These Asian territories generally conform with the stylised fact that reliance on OOP payments declines as national income rises (Musgrove and Zeramdini, 2001). The poorest country, Nepal, obtains three-quarters of its funding for health care from OOP payments, while the richest country, Japan, obtains only 12% from this source. But at similar levels of income, the OOP share does vary; for instance, it is greater in China than it is in Sri Lanka.

In Nepal, Bangladesh, Kyrgyz, Punjab and Sri Lanka, health care is financed almost exclusively from OOP and general government revenues (GGR). These countries/states lie very close to the hypotenuse of the health financing triangle presented in Fig. 1. Nepal and Bangladesh rely more heavily on OOP, while the burden is close to being evenly split in Kyrgyz, Punjab and Sri Lanka. Insurance (social and private) makes a relatively modest contribution to health financing in Indonesia, the Philippines, Hong Kong and Thailand and a more substantial contribution in China, Korea, Taiwan and Japan. Hong Kong and Thailand are similar in relying most heavily on GGR followed by OOP, with the remainder made up from private insurance in Hong Kong and both private and social insurance in Thailand. Three of the high/middle-income territories – Japan, Taiwan and Korea – have universal social insurance systems. Hong Kong, the only other high-income economy, also relies predominantly on publicly financed pre-payment, but does this through taxation rather than social insurance. Japan and Taiwan collect more than half of health system funding from social insurance, while high co-payments in Korea mean that it still collects half of all financing from direct payments.

Social insurance is at varying stages of development across Asia. In Japan, Korea and Taiwan there is universal coverage funded through employee and employer contributions with state subsidies for low-income groups (Table 2). In Thailand, there is social insurance for civil servants and formal, private sector employees. In 2001, coverage was extended to the remaining 30% of the population, financed from taxation. In principle, there is universal coverage

Table 2  
Characteristics of social health insurance systems

	Groups covered	Unification/fragmentation of funds	Contribution shares			Earnings limits on contributions	Rate structure of contributions
			Employee	Employer	State		
China	Employees of state and collective owned units	Single fund	25%	75% (employer/State)		None	8% of basic salary
Indonesia	Formal sector employees	Separate funds for public and private sectors	22% (employee/employer)		78%	None	2% (public) and 3–6% (private) of basic salary
Japan	Whole population	Separate funds by regions and company	50%	50%	0%	None	3–9% earnings depending on earnings and family status
Korea Rep.	Non-poor population <sup>a</sup>	Single fund	50%	50%	0%	Upper limit abolished 2002	3.7% of earnings
Kyrgyz Rep.	Employees, self-employed, pensioners, unemployed, children (<16 years) and welfare recipients	Single fund	0%	78%	22%	Upper limit at 120 × minimum wage	2% of salary (self-employment income). 5% of basic land tax on farmers
Philippines	Target coverage is universal but effective coverage is 48.75% of population (June 2002) <sup>b</sup>	Single fund with separate programs for public employees, private employees, individually paying, retired and indigent	Employees – 50% <sup>c</sup> Individually paying – 100% Indigent – 0%	50% 0% 0%	0% 0% 100%	Upper limit	2.5% of basic earnings
Punjab	Low income employees and dependents in formal factory sector	Single fund	23.5%	76.5%	12.5%	None (no cover above earnings limit)	1.75% (employee) and 4.75% (employer) of earnings
Taiwan	Whole population	Single fund	Varies with occupation and income <sup>d</sup>			Lower and upper limits	4.25% of upper bound of 29 earnings intervals <sup>e</sup>
Thailand	Civil servants and formal sector employees. Remainder brought universal coverage in 2001	Single fund with separate programs for civil servants and private sector employees. Remainder financed from tax	33.3%	33.3%	33.3%	Lower and upper limits	3% earnings

<sup>a</sup> Households below poverty line (4.6%) are covered by tax financed medicaid scheme.

<sup>b</sup> Of those covered: 23.9% govt. employees; 55.4% private sector employees; 11.2% individually paying; 7.8% indigent; 1.9% retirees.

<sup>c</sup> Retired are covered, at zero premium, on condition of at least 10 years of contributions.

<sup>d</sup> E.g. Manual workers – 30% employees, 60% employer and 10% State. Govt. employees – 35%/0%/65%. Low income – 100% State.

<sup>e</sup> In 2002, rate increased to 4.55% and number of intervals raised to 38.

in the Philippines but effective coverage remains at less than 50%. In Indonesia, there is coverage for formal sector employees. In China and Punjab, coverage is restricted to state sector and low-earnings workers, respectively. The financing split between employee, employer and state varies, with the universal systems in the richer territories relying more on employee and employer contributions with the state subsidising cover of the poor only. Only China, Indonesia and Japan operate without an upper earnings limit beyond which contributions are not paid on additional earnings. In most cases, contributions are some percentage of earnings, although the rates vary markedly.

In all countries, with the exception of Sri Lanka, charges are levied for the vast majority of health services and medicines provided under the public or social insurance system (Van Doorslaer et al., 2007). Immunisations and family planning services are usually provided free and primary care is sometimes free (Punjab, Kyrgyz and the Philippines) or highly subsidised (Nepal). In principle, exemptions or reduced charges for the poor in many countries (Bangladesh, Hong Kong, Indonesia, Nepal, the Philippines, Taiwan and Thailand) shift the financing burden onto the better-off but poor implementation of fee waivers often weakens this effect (Ahrin-Tenkorang, 2000; Tien and Chee, 2002).

### 3. Data and methods

To estimate the distribution of each component of health care financing in relation to ability to pay (ATP), we use data from household expenditure or socioeconomic surveys (see Table A1). In the low- and lower-middle-income territories, in which there is substantial household-based production, a lack of formal labour markets and high variability across time in household income, the value of household consumption is used as a proxy for permanent income and ability to pay (ATP) (see Table A2) (Deaton and Grosh, 2000).<sup>1</sup> For the high income territories, ATP is measured by household expenditure on market traded goods and services. The one exception is Japan, where the only available measure is income. The unit of analysis is the household. Consumption/expenditure and health financing contributions are aggregated to the household level. Adjustment is made for the size and age structure of the household through application of an equivalence scale to both ATP and each component of health financing. The scale used is  $e_i = (A_i + 0.5K_i)^{0.75}$ , where  $A_i$  is the number of adults in the household and  $K_i$  the number of children (0–14 years).<sup>2</sup>

It is assumed that the incidence of direct personal taxes is on the legal taxpayer, that consumption taxes are borne by the consumer and that both employer and employee social and private insurance contributions are, in effect, paid for by the employee.<sup>3</sup> For some sources of finance, actual payments are reported in the survey. This is typically the case for OOP payments and it is sometimes true for income taxes, social insurance contributions and private insurance premiums (see Table A2). Other payments are not directly reported and must be estimated from some related variable reported in the survey. For example, payments of sales and excise taxes must be estimated by applying product specific tax rates to the respective reported expenditures. Likewise, tax schedules are applied to reported incomes. Social insurance contribution rates and rules are applied to reported earnings. Survey data on OOP payments are potentially subject to both recall bias and small sample error due to the infrequency with which some health care payments are made. It is assumed that the reporting of payments is not systematically related to ATP and so the survey data provide an unbiased estimate of the distribution of payments.

The distribution of health financing contributions across the population in relation to ability to pay is summarised by the concentration index ( $C$ ) (Wagstaff and Van Doorslaer, 1992). This index is restricted to the range  $(-1, 1)$ , with a positive (negative) value indicating that the rich (poor) contribute a larger share than the poor (rich). The index takes a value of zero if everyone pays the same, irrespective of ATP. We are interested not only in whether the rich contribute absolutely more than the poor but also whether they contribute more relative to ability to pay. The latter is examined through the Kakwani index ( $K$ ), which is the difference between the concentration index and the Gini coefficient of inequality in the ATP measure (Kakwani, 1977) and lies in the range  $(-2, 1)$ . A negative value indicates that, on average over the range of the ATP distribution, contributions fall as a proportion of ATP as the latter increases—there

<sup>1</sup> The consumption measure includes imputed use values of durables and the rental value of housing in the cases of Indonesia and Nepal. Housing costs are imputed for the Philippines and Sri Lanka. Actual expenditures on durables are included in total consumption for Bangladesh, China, Punjab, Sri Lanka and Thailand.

<sup>2</sup> Parameter values have been set on the basis of estimates presented in Deaton (1997, pp. 241–270).

<sup>3</sup> That is, we assume competitive markets with perfectly elastic product supply curves and perfectly inelastic labour supply. Obviously, these are simplifying assumptions made in the absence of detailed estimates of the competitiveness of markets and their demand and supply elasticities. The degree to which the assumptions match reality no doubt vary across product markets and countries.

is regressivity. A positive value indicates that the share of payments made by the rich is greater than their share of total ATP—progressivity. In the case of proportionality, the index is zero.

Each index is computed from a convenient regression of a transformation of the contribution variable on the fractional rank in the ATP distribution (Jenkins, 1988). Sample weights are applied (Lerman and Yitzhaki, 1989). Standard errors, with a Newey–West correction for serial correlation induced by the rank nature of the independent variable and heteroscedasticity, are obtained directly from the convenient regressions (O'Donnell et al., 2007a,b).

The additive separability of concentration and Kakwani indices means that an index of the distribution of total health financing contributions can be computed as a weighted average of the source-specific indices (Suits, 1977). Weights are equal to the proportion of total financing accounted for by each source. For example,  $K = \sum_j \omega_j K_j$ , where  $K_j$  is the Kakwani index for finance source  $j$  and the weight  $\omega_j$  is the proportion of total expenditure on health contributed by that source. In addition to being of computational convenience, this allows decomposition of the distribution of total financing into the distribution of the different sources of finance, on the one hand, and the financing mix, on the other. A further advantage is that, through the choice of weights, correction can be made for the incomplete coverage of all sources of health financing in the survey data and for biases in the survey estimates of aggregate payments. We use survey data to estimate the indices and derive weights from health accounts estimates of the financing mix.

Assumptions must be made about distributions of financing sources that cannot be estimated from the survey data. It is assumed that missing direct taxes, like corporation and capital gains taxes are distributed as a weighted average of the direct taxes for which distributions can be estimated. Likewise for indirect taxes. Non-tax government revenues, for example the revenues from public enterprises and the exploitation of natural resources, are assumed to be distributed as a weighted average of all other financing sources. The same is assumed for private insurance premiums in Indonesia and Punjab, where premiums are not recorded in the survey data. We consider the incidence of financing on the domestic population only and so do not allocate finance from foreign aid. Revenue from aid is not included in the measure of total health financing used as the denominator of the weights. As a result of these adjustments, the weights in Table 3 do not correspond exactly to the financing mix shares in Table 1.

#### 4. Distribution of health care financing

In this section, we present the distributional incidence of health financing by each of the main sources and in aggregate. The results are summarised in Table 3.

##### 4.1. Taxation

In all territories, the burden of direct taxes is heavily concentrated on the better-off, both in absolute terms and relative to ability to pay. The concentration indices are all positive and at least 0.4 in magnitude, confirming that the better-off pay the largest share of direct taxes (Table 3). The index is above 0.8 in Bangladesh, the Philippines, Sri Lanka and Thailand, indicating that direct taxes are paid almost exclusively by the better-off in these low- and lower-middle-income countries.<sup>4</sup> The Kakwani indices are all positive; the proportion of household resources absorbed by direct taxes rises with ATP. Progressivity is strongest in Bangladesh, the Philippines, Sri Lanka and Thailand. But the proportion of health financing raised from direct taxation is much higher in the Philippines and Thailand and so it makes a greater contribution to the overall progressivity of health financing in these two countries. Direct taxes are near proportional only in Japan. In general, progressivity is lower in high-income economies with broader tax bases. Hong Kong is a striking exception, where direct taxes are not only very progressive but they also make a large contribution to health financing. The redistributive effect of a tax or payment depends positively not only on its progressivity but also on its average rate (Aronson et al., 1994; Van Doorslaer et al., 1999). Hence, the very progressive direct taxes seen in some of the low-income countries have very small redistribution effects since they raise so little revenue.<sup>5</sup> The

<sup>4</sup> Shares of direct tax payments, and of all the main financing sources, made by the top and bottom ATP quintiles are presented in the working paper version of this article (O'Donnell et al., 2005). That paper also gives more detailed description of which tax distributions are estimated from the data and which taxes are allocated under the assumption that they are distributed as other taxes.

<sup>5</sup> Estimates of the redistributive effects are given in the working paper version of the article (O'Donnell et al., 2005).



Table 3  
Concentration and Kakwani indices for health financing by source and in aggregate

	Index	Direct taxes	Indirect taxes	Social insurance	Private insurance	Direct payments	Total financing
Bangladesh (1999–2000)	Concentration	0.8925	0.4511	N/A	N/A	0.5593	0.5543
	Kakwani	0.5523	0.1110			0.2192	0.2142
	Weights	0.0473	0.1922			0.7605	
China (2000)	Concentration	0.6038	0.4915	0.6865	N/A	0.4349	0.4921
	Kakwani	0.1521	0.0398	0.2348		−0.0168*	0.0404
	Weights	0.0242	0.1298	0.1818		0.6642	
Hong Kong SAR (1999–2000)	Concentration	0.7840	0.5003	N/A	0.4304	0.4014	0.5590
	Kakwani	0.3940	0.1102		0.0403*	0.0113*	0.1689
	Weights	0.3755	0.0975		0.1489	0.3781	
Indonesia (2001)	Concentration	0.4935	0.3713	0.6029	No data	0.4734	0.4701
	Kakwani	0.1962	0.0741	0.3057		0.1761	0.1729
	Weights	0.1466	0.1052	0.0353		0.7129	
Japan (1998)	Concentration	0.4192	0.1007	0.2827	N/A	0.0550*	0.2553
	Kakwani	0.0950	−0.2232	−0.0415		−0.2691	−0.0688
	Weights	0.1952	0.1368	0.5400		0.1280	
Korea Rep. (2000)	Concentration	0.6031	0.3726	0.1714	N/A	0.3472	0.3108
	Kakwani	0.2683	0.0379	−0.1634		0.0124*	−0.0239
	Weights	0.0831	0.0792	0.3390		0.4987	
Kyrgyz Rep. (2000)	Concentration	0.5410	0.3522	0.4437	N/A	0.2495	0.3101
	Kakwani	0.2395	0.0508	0.1422		−0.0520*	0.0087
	Weights	0.0690	0.3149	0.0422		0.5740	
Nepal (1995–96)	Concentration	0.4828	0.4538	N/A	N/A	0.3925	0.3873
	Kakwani	0.1436	0.1143			0.0533	0.0625
	Weights	0.0298	0.1067			0.8635	
Philippines (1999)	Concentration	0.8297	0.4511	0.5948	0.5100	0.5878	0.6020
	Kakwani	0.3809	0.0024	0.2048	0.1199*	0.1391	0.1631
	Weights	0.1840	0.1607	0.0553	0.1118	0.4882	
Punjab (1999–2000)	Concentration	No data	0.3103	No data	No data	0.2985	0.3009
	Kakwani	No data	0.0579		(tiny share)	0.0461*	0.0485
	Weights		0.1991			0.8009	
Sri Lanka (1996–7)	Concentration	0.9567	0.3774	N/A	Included	0.4561	0.4724
	Kakwani	0.5693	−0.0100		with direct	0.0687	0.0850
	Weights	0.0818	0.3131		payments	0.6050	
Taiwan (2000)	Concentration	0.5325	0.3019	0.2419	0.4685	0.1762	0.2605
	Kakwani	0.2601	0.0296	−0.0305	0.1961	−0.0962	−0.0119
	Weights	0.0560	0.0324	0.5197	0.0893	0.3026	
Thailand (2002)	CI	0.9057	0.5776	0.5760	0.3995	0.4864	0.5929
	Kakwani	0.5101	0.1819	0.1803	0.0039*	0.0907	0.1972
	Weights	0.1868	0.3155	0.0582	0.0668	0.3728	

N/A – not applicable (source does not exist); no data – data not available to estimate distribution; (\*) for social/private insurance and direct payments indicates not significantly different from zero at 5%. Inference not undertaken for taxes and total financing indices since these are computed as weighted averages.



redistributive effect is much larger in Hong Kong, which is the only economy, apart from Japan, in which direct tax expenditures on health care exceed 1% of GDP.

The burden of indirect taxes is also concentrated on the better off but to a much lesser extent than for direct taxes as indicated by positive but smaller concentration indices (Table 3). Indirect taxes are most concentrated on the better off in Thailand, then Hong Kong SAR and China. Japan has a markedly lower concentration index than all the others and its Kakwani index is negative, indicating regressivity. With Kakwani indices close to zero, indirect taxes diverge little from proportionality in China, Indonesia, Korea, Kyrgyz, the Philippines, Punjab, Sri Lanka and Taiwan. Greater proportionality of indirect taxes is to be expected since they are levied on expenditure and the ATP is approximated here by consumption/expenditure. The exceptional result for Japan may be partly due to the use of income as the ATP measure. Sales taxes will be less proportional to income than they are to total expenditures.

#### 4.2. Social insurance

The distribution of social insurance contributions depends on the extent of population coverage. In low- and middle-income countries, where typically only formal sector workers are covered (China, Indonesia, the Philippines and Thailand), the poor make little contribution to social insurance revenues simply because they do not belong to the systems or they receive subsidised cover financed from taxation (see Table 2). Contributions are concentrated on the better off, both absolutely and relative to ATP. Concentration indices are large and Kakwani indices significantly positive for these partial coverage systems (Table 3), indicating that the better-off contribute more both absolutely and relative to household consumption. But this also means that insurance coverage is largely restricted to the better-off.

In the three universal social insurance systems (Japan, South Korea and Taiwan), concentration indices are smaller than in the partial systems but still significantly positive. Kakwani indices are negative but close to zero in Japan and Taiwan. Such proportionality is built into social insurance systems through the near constant contribution rates across the earnings distribution. The slight tendency toward regressivity arises because labour market earnings fall as a proportion of total household resource as the latter rises. The Korean system is less regressive than is indicated by the year 2000 data analyzed since the upper earnings limit on contributions was abolished in 2002. Other reasons for the greater regressivity of the Korean system are the constant contribution rate (in Japan it varies with earnings) and, unlike Taiwan, the lack of government subsidies for any groups other than the poor.

#### 4.3. Direct payments

The significantly positive concentration indices for direct payments in Table 3 indicate that the better-off pay more out-of-pocket for health care. The only exception is Japan.<sup>6</sup> With the exceptions of Kyrgyz and Punjab, there is heavy concentration of OOP payments on the better-off in the low- and lower-middle-income countries. In Korea and Taiwan, the concentration indices are smaller, reflecting the fact that social insurance co-payments are incurred across the full range of the income distribution. By contrast, in high-income Hong Kong, OOP payments are more concentrated on the rich since they are mainly for private care, which is consumed predominantly by the better-off. Only in Japan and Taiwan is the Kakwani index significantly negative indicating that the rich spend proportionately less of their income out-of-pocket for health care. In China, Hong Kong, Korea, Kyrgyz and Punjab OOP payments increase proportionally to ability to pay. In the remaining territories – all low- and lower-middle-income – the better-off directly spend proportionally more of their household resources on health care.

#### 4.4. Total health care financing

Concentration and Kakwani indices for the total health care financing contributions are presented in the final column of Table 3. These are calculated as weighted averages of the indices for the financing sources, as explained in Section 3. In addition to the sources already discussed, indices for the distribution of private insurance premiums are given. In all

<sup>6</sup> We should perhaps be a little cautionary about this particular result since the Japanese survey used to estimate the OOP distribution is rather small and not nationally representative. On the other hand, the result is perfectly consistent with findings for most other OECD countries (Wagstaff et al., 1999).

cases where private insurance exist and the survey data allow estimation of its distribution, the respective concentration index is strongly positive due to the fact that only the more wealthy households take out private cover.

Without exception, the concentration indices for total health care financing are positive. The better-off pay most for health care in Asia. The concentration indices are smallest in the three universal social insurance systems (Japan, Taiwan and Korea) and in Kyrgyz and Punjab. Only in the three high-income social insurance systems are the Kakwani indices negative. In contrast, the predominantly tax financed system of Hong Kong is clearly progressive. Although direct payments account for a substantial share of health financing in Hong Kong, the poor are shielded from these payments and the progressivity of health financing reflects that of taxation.

Health care financing is most concentrated on the better off in the Philippines and Thailand, two lower-middle-income countries. Both rely heavily on direct payments but do spread financing across a range of instruments. The payment distributions of the individual sources are broadly similar across the two countries and are always concentrated more on the rich than the poor. However, despite these apparent similarities, the distributional implications of the two systems differ substantially. Thailand collects one half of health care funding through taxation, while in the Philippines the proportion is just over one third. The Philippines relies more on financing instruments that tie access to payment, i.e. partial social insurance, private insurance and direct payments. The better off not only pay more for health care in the Philippines, they most probably also obtain more or better care. The same observation applies with even greater force to Bangladesh, where payments are heavily concentrated on the better off but this is achieved through extensive reliance on direct payments. Hong Kong and Indonesia have the same Kakwani index for total payments but in Hong Kong this arises from a system that collects more than half of revenue through the public sector, whereas in Indonesia only just over a quarter of payments are public. These comparisons make clear that to make inferences about the equity of health care financing it is not sufficient to examine the distribution of the total financing burden. The structure of financing, in particular the balance between instruments that make utilisation contingent on payments and those that do not, and the impact of financing on the utilisation of health care should also be considered.

## 5. Distribution of health care utilisation

To enrich interpretation of the health care financing distributions presented above, and in particular to consider whether the better-off not only pay more but also receive more health care, we examine the distribution of health care utilisation in this section. This is done using data from health and socioeconomic surveys to estimate the distributions of hospital inpatient and outpatient care, and of non-hospital ambulatory care across individuals in relation to the same measure of ability to pay as used in the finance analysis. The analysis could be undertaken for all the study countries except Japan, Kyrgyz, Nepal and the Philippines. It was done for the whole of India rather than Punjab but only for two Chinese provinces – Gansu and Heilongjiang – rather than the whole country.

Our purpose is to assess whether the distribution of health care utilisation reflects that of payments toward the financing of health care. The primary goal is not to test whether there is horizontal equity in the distribution of health care. The latter would require standardization for differences in need. This is difficult using survey data from low-income countries since the self-reported health measures typically used in horizontal equity analyses (Van Doorslaer et al., 2000) to standardise for need often do not show the same socio-economic gradients that are apparent in more objective measures of health (Baker and Van der Gaag, 1993; Wagstaff, 2002). This may be due to strong socio-economic differences in health expectations. Nonetheless, if desired, a horizontal equity interpretation can often be placed on the unstandardised distribution of health care in low-/middle-income countries. Since it is reasonable to assume that the poor are in worse health and in greater need of health care (Gwatkin et al., 2003), any distribution of health care that is not pro-poor reflects horizontal inequity.<sup>7</sup>

Concentration indices for each category of care in each of the public and private sectors and in aggregate are given in Table 4. In aggregate, the better-off receive more health care than the poor in the lowest income countries/provinces that rely most heavily on direct payments for financing of health care—Bangladesh, Gansu, Heilongjiang, India and Indonesia. This suggests that the poor in these low-income countries pay less and receive less health care since they simply cannot afford to pay and so forego treatment. The pro-rich bias is greatest for inpatient care and smallest for

<sup>7</sup> A horizontal equity analysis has been undertaken for three of the high-income economies (Hong Kong, Korea and Taiwan), where valid self-reported health measures are available in the survey data (Lu et al., 2007).

Table 4  
Concentration indices for health care utilisation

Territory	Hospital inpatient			Hospital outpatient			Non-hospital care		
	Public	Private	Total	Public	Private	Total	Public	Private	Total
Bangladesh	0.3174	0.3620	0.3361	0.0987	−0.0174*	0.0649	0.0134*	−0.0222	−0.0214
Gansu – China <sup>a</sup>	0.2963	–	–	0.0446*	–	–	–	–	–
Heilongjiang – China <sup>a</sup>	0.3824	–	–	0.1820	–	–	–	–	–
Hong Kong	−0.4347	0.2074	−0.3814	−0.4333	0.0893*	−0.3231	−0.3159	0.0905	0.0094*
India	0.2458	0.4730	0.3605	0.1311	0.1652	0.1504	−0.0505*	0.1368	0.1184
Indonesia	0.3745	0.4953	0.4243	0.3120	0.3813	0.3416	−0.0931	0.0907	0.0165
Korea Rep. <sup>b</sup>	–	–	−0.2176	–	–	–	–	–	−0.0975
Sri Lanka	−0.0553*	0.3767	0.0109*	−0.0709	0.1267	−0.0414	0.0531*	0.1708	0.1529
Taiwan <sup>b</sup>	–	–	−0.1170	–	–	−0.0179*	–	–	−0.0274
Thailand	−0.0335*	0.5963	0.0720*	−0.0404	0.2638	0.0838	−0.2099	−0.0014	−0.1056

Sources: Authors' calculations from the following datasets: Bangladesh – Health and Demographic Surveys, 1999–2000; Gansu/Heilongjiang – National Health Household Interview Surveys, 2003; Hong Kong – Thematic Household Survey, 2002; India – National Sample Survey, 1995–96; Indonesia – SUSENAS, 2001; Korea – National Health Survey, 1998; Sri Lanka – Consumer Finance Survey, 1996–97; Taiwan – National Health Interview Survey, 2001; Thailand – Socioeconomic survey, 2002. Notes: (\*) indicates that index is not significantly different from zero at 5%.

<sup>a</sup> All care is classified as public sector. The survey asks about hospital care only but covers five levels of hospital.

<sup>b</sup> The survey does not distinguish between public and private sector care.

non-hospital care. In Bangladesh, non-hospital care is actually slightly pro-poor, reflecting the reliance of the poor on unqualified, low quality private sector providers. In Sri Lanka and Thailand, aggregate inpatient care is evenly distributed in relation to ability to pay. In contrast to the other low- and lower-middle-income countries, this neutrality is achieved by the even distribution of public sector care. Among other factors, this appears to be due to the near absence of user charges in Sri Lanka and an effective system of subsidizing the poor in Thailand.<sup>8</sup> An equal distribution of health care is not necessarily an equitable one since the poor, particularly in low-income countries, are likely to be in greater need. So, even in Sri Lanka and Thailand, it does not appear that horizontal equity is being achieved. But it is even further from being achieved in Bangladesh, the Chinese provinces, India and Indonesia where there is greater reliance on OOP financing of health care. Only in the high-income economies with universal coverage (Hong Kong, Korea and Taiwan) do the poor receive more health care than the rich. Utilisation is determined by need rather than ability to pay (Lu et al., 2007).

## 6. Discussion

Who pays for health care in Asia? The short answer is that the better-off pay more. In the low- and lower-middle-income countries examined, this is true not only in absolute terms but also relative to ability to pay. In the three high-income territories with universal social insurance (Japan, South Korea and Taiwan), health care financing is slightly regressive. In Hong Kong, health financing is drawn more from taxation and is progressive. These findings for high-income Asian economies are consistent with those for Europe, where social insurance systems tend to be proportional to regressive, while tax-based systems are generally progressive (Wagstaff and Van Doorslaer, 1992; Wagstaff et al., 1999).

Although caution should be exercised in inferring a relationship from data across only 13 territories, there does appear to be some tendency for the burden of health care financing to be less concentrated on the better-off in more developed economies. In part, this is due to differences in the structure of financing. As an economy grows, reliance on out-of-pocket financing falls and social insurance is typically established. The latter tends to be broadly proportional because contributions are levied as a fixed percentage of earnings. In addition, development broadens the tax base, allowing greater reliance on tax financing and the opportunity to shift the balance of taxation from indirect to direct. But it is not only the financing mix that responds to development. The distributions of specific sources of finance also change. This is true of direct taxation, which becomes less progressive, but not necessarily less redistributive, as the tax base is broadened. Similarly, social insurance contributions are spread more evenly across the population as a system matures from partial to universal coverage.

Out-of-pocket payments are typically perceived to be the most regressive instrument of health finance (Whitehead et al., 2001). In high-income economies, we do indeed find that OOP payments are regressive or are proportional to ability to pay. But in most of the low-/middle-income countries, OOP payments absorb a larger share of the resources of the better-off households.<sup>9</sup> Fee waivers for the poor may contribute to this result in some countries. For example, health card systems in Indonesia and Thailand may be responsible for the greater concentration of payments on the better-off in these countries relative to China and Punjab. But the most plausible explanation is that the absence of health insurance means that the better-off must pay out-of-pocket for health care, possibly to obtain higher quality care in the private sector, while the poor simply cannot afford to pay and so go without treatment. This is consistent with our finding that health care utilisation is skewed toward the better-off in the low-/middle-income countries that rely most on OOP financing. In higher income economies, absolute poverty is lower and OOP payments are less of a barrier to health care consumption. Then, income-related health inequality can make OOP payments regressive.

The evidence usually cited for the regressivity of direct payments in low-income countries is typically not from nationally representative expenditure surveys, as used here, but from health surveys conducted in one, usually rural, region (e.g. Ensor and Pham, 1996; Pannarunothai and Mills, 1997; Fabricant et al., 1999; Segall et al., 2002). Omission of payments made by the better-off urban population is a significant limitation if the aim is to draw conclusions about

<sup>8</sup> See O'Donnell et al. (2007b) for a detailed study of the distributional incidence of public health spending in these countries.

<sup>9</sup> Gertler et al. (1987) show that, in Peru, the effects of user fees on health care utilisation and on welfare relative to income are larger for the poor than the rich. In these terms, they label user fees regressive. While these are undoubtedly important effects to be considered, we stick to the conventional definition of regressivity as payments as a proportion of income falling as income rises.

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 is nationally representative. Analytical sample randomly selected from all survey households in 10 provinces	Stratified, Weights applied	Household	100	9,700 (from total survey of 85,000)
Hong Kong SAR	1999–2000	Household expenditure survey (HES)	Census and Statistics Department, Government of HK SAR	All land domestic households, except those receiving welfare	Stratified. Weights applied	Household	79.50	6,116
		HES on CSSA <sup>a</sup> (welfare) households	As above	All CSSA (welfare) cases, with some exceptions <sup>b</sup>	Stratified. Weights applied	Household	95.50	1,510
Indonesia	2001	Socioeconomic Survey (SUSENAS)	National Board of Statistics	Nationally representative	Stratified, cluster sampling. Self-weighted	Household	98	218,568
Japan	1998	Comprehensive survey of living conditions (CSLC)	Government	Nationally representative	Stratified	Household	100	70,000
	2002	Health care survey <sup>c</sup>	Osaka University	Only a few prefectures	Stratified	Household		1,400
Korea Rep.	2000	Urban household survey	National Statistical Office	Urban only (78.5% of population)	Stratified, cluster sampling	District, then household	82	62,632
Kyrgyz Rep.	2000–2001	Household budget survey	National Statistical Committee	Nationally representative	Stratified, sample weights applied	Household	>90	3,000
Nepal	1995–1996	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
	1994	Family income and expenditure survey <sup>d</sup>	National Statistics Office	Nationally representative	Stratified	Household	100	24,797
Punjab	1999–2000	Consumer expenditure survey	National Sample Survey Organisation	Analysis only for Punjab (relatively developed state).	Stratified, sample weights applied	Household	100	4,035
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	13,801
Thailand	2002	Socio-economic survey	National Statistical Office	Nationally representative	Stratified, weights applied	Household	93	17,489

<sup>a</sup> 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.

<sup>b</sup> Covers 99% of CSSA families and 65% of CSSA single persons.

<sup>c</sup> Used to estimated distribution of OOP payments.

<sup>d</sup> Used to estimate distributions of private and social insurance premiums.

Table A2  
Measures of ability to pay and methods of measuring health financing contributions

Territory	Ability to pay <sup>a</sup>	Personal income tax <sup>b</sup>	Sales/excise tax <sup>c</sup>	Social insurance <sup>b</sup>	Private insurance	Reported OOP payments include <sup>d</sup>
Bangladesh	Consumption	Estimated	Estimated	No SI	No data	Outpatient, inpatient, medicines, test/investigation, transport, tips, other
China	Consumption	Reported	Estimated	Estimated	No PI	Outpatient, inpatient, medicines, other
Hong Kong SAR	Expenditure	Estimated	Estimated	No SI	Reported	Outpatient, inpatient, medicines, traditional medicine, dental, medical supplies, health supplement, other
Indonesia	Consumption	Estimated	Estimated	Estimated	No data	Outpatient, inpatient, medicines
Japan	Income	Reported	Estimated	Reported	No data	Outpatient, inpatient, medicines and any co-payments
Korea Rep.	Expenditure	Reported	Estimated	Reported	No PI	Outpatient, inpatient, medicines, dental, medical supplies, tests
Kyrgyz Rep.	Consumption	Reported	Estimated	Reported/estimated	No PI	Outpatient, inpatient, medicines, dental, acute care
Nepal	Consumption	Reported	Estimated	No SI	No PI	Outpatient, inpatient, medicines, traditional medicine, tests
Punjab	Consumption	No data. Small share	Estimated	No data. SI small	No data PI small	Outpatient, inpatient and medicines
Philippines	Consumption	Reported	Estimated	Reported	Reported	Outpatient, inpatient, medicines, traditional medicine
Sri Lanka	Consumption	Estimated/reported <sup>e</sup>	Estimated	No SI	No data. PI small	Outpatient, inpatient, medicines, tests, spectacles, dental, homeopathy and acupuncture, charms and others
Taiwan	Expenditure	Reported	Estimated roughly <sup>f</sup>	Reported	Reported	Outpatient, inpatient, medicines, medical equipment, dental, nursing home, tests, traditional medicines, medical supplies
Thailand	Consumption	Reported	Estimated	Reported	Estimated from life insurance premiums	Outpatient, inpatient, medicines, traditional medicine

<sup>a</sup> All computed at household level per equivalent adult.

<sup>b</sup> *Estimated* indicates that the tax/contribution schedule is applied to reported incomes/earnings. *Reported* indicates that the amount paid is reported in the survey.

<sup>c</sup> *Estimated* indicates that product specific tax rates are applied to reported product specific expenditures/quantities.

<sup>d</sup> *Outpatient, inpatient* refers to consultation fees and hospital/clinic charges. *Medicines* include self-medication.

<sup>e</sup> PAYE, corporate and capital gains taxes estimated. Other direct taxes reported.

<sup>f</sup> Average indirect tax rate applied to all taxable expenditure.

the distribution of payments across the whole population. Further, health surveys cannot 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.

Interest in the distribution of health financing arises, in part, from its potential redistributive effect. This is obvious for compulsory contributions toward health financing. Progressive taxation takes proportionately more from the rich than the poor and equalises the post-tax distribution of income. Proportional social insurance contributions have no effect on the income distribution. But a redistributive interpretation cannot be placed on payments that are voluntary and made in direct return for health care. Then, as demonstrated above, those who pay more also receive more. With respect to such payments, it is their impact on the utilisation of health care and consequently the distribution of health that is the major equity concern in low-/middle-income Asia. But they can also have an important impact on economic welfare that should not be overlooked. With restricted health insurance cover, large, unforeseen expenditures on health care can have catastrophic consequences for living standards and, in the extreme, may push households into, or further into, poverty (Wagstaff and Van Doorslaer, 2003; Xu et al., 2003). We examine this aspect of health financing in Asia elsewhere (Van Doorslaer et al., 2006; Van Doorslaer et al., 2007).

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## Appendix A

See Tables A1 and A2.

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