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HEALTH EQUITY AND FINANCIAL PROTECTION REPORT

TIMOR-LESTE

About the Health Equity and Financial Protection Reports

The Health Equity and Financial Protection reports are short country-specific volumes that provide a picture of equity and financial protection in the health sectors of low- and middle-income countries. Topics covered include: inequalities in health outcomes, health behavior and health care utilization; benefit incidence analysis; financial protection; and the progressivity of health care financing. Data are drawn from the Demographic and Health Surveys, World Health Surveys, Multiple Indicator Cluster Surveys, Living Standards and Measurement Surveys, as well as other household surveys, and use a common set of health indicators for all countries in the series. All analyses are conducted using the health modules of the ADePT software. Also available are Health Equity and Financial Protection datasheets that summarize key measures of equity and financial protection.

The most recent versions of the Health Equity and Financial Protection reports and datasheets can be downloaded at **www.worldbank.org/povertyandhealth**.

Full citation: World Bank. 2014. Health Equity and Financial Protection Report – Timor-Leste. Washington, D.C.: World Bank.

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ACKNOWLEDGEMENTS

LIST OF ABBREVIATIONS AND ACRONYMS

ARI	Acute respiratory infection
BIA	Benefit-incidence analysis
CHC	Community health centers
CI	Concentration index
CPI	Consumer price index
DHS	Demographic and Health Survey
EAP	East Asia and Pacific
GDP	Gross domestic product
GHE	Government health expenditures
GNI	Gross national income
HIES	Household Income and Expenditures Survey
HNGV	Hospital Nacional Guido Valadares
MCH	Maternal and child health
MICS	Multiple Indicator Cluster Survey
MoH	Ministry of Health
NHA	National health accounts
OOPs	Out-of-Pocket Spending
PPP	Purchasing power parity
SAMES	Serviço Autónomo de Medicamentos e Equipamentos de Saúde
SISCa	Sistema Integradu Saude Communitaria
THE	Total health expenditure
TLSLS	Timor Leste Survey of Living Standard
WDI	World Development Indicators
WHO	World Health Organization

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This report analyses equity and financial protection in the health sector of Timor-Leste. In particular, it examines inequalities in health outcomes, health behavior and health care utilization; benefit incidence analysis; financial protection; and the progressivity of health care financing. Data are drawn from the 2009/2010 Demographic and Health Survey, the 2001-2002 and 2007-2008 Living Standards and Measurement Surveys as well as 2011-2012 Household Income Expenditure Survey, and the Ministry of Finance. All analyses are conducted using original data and performed using the health modules of the ADePT software.

Is ill health more concentrated among the poor?

Yes, with exceptions. In general, ill health is concentrated among the poor in Timor-Leste. This includes some selected indicators of child health such as infant mortality, under-5 mortality, stunting, and underweight. But wealthier households are more likely to report child illnesses such as diarrhea and fever, potentially because of their ability to more easily recognize these symptoms. With respect to available measures of adult health, the better-off are more likely to experience sexually transmitted diseases among men, and obesity among non-pregnant women. Some risky health behaviors such as smoking are more prevalent among the poor.

Do the poor use health services less than the rich?

Yes. Health care utilization in Timor-Leste is concentrated among the better-off. Immunizations, treatment of acute respiratory infections, and use of bed nets are higher among children from wealthier households. Skilled antenatal care and delivery, contraceptive prevalence and use of bed nets are also higher among women from wealthier households.

Is the distribution of government spending on health pro-rich or pro-poor?

Pro-rich. Government spending on hospital care is found to be pro-rich, regardless of the assumptions made in the benefit-incidence analysis. When it comes to lower level health care services such as community health centers, health posts and mobile clinics, government spending is pro-poor using two of three methodological assumptions. Taken together, total subsidies for health are found to be pro-rich. Generally, government expenditure on health favors the better-off.

What is the effect of out-of-pocket payments on household financial well-being?

Minor. Out-of-pocket spending as a share of total health expenditures is only about 4 percent in Timor-Leste. Only 0.9 percent of households spend 10 percent of their household income or more on out-of-pocket health payments and 9.6 percent of households spend 10 percent or more of nonfood consumption on out-of-pocket payments. Health spending has a small effect on increasing the poverty rate. Less than 1 percent of households fell under the $1.25/day poverty line because of health spending. This is similar to results from 2001/02 and 2007/08.

Is health financing progressive or regressive?

Progressive. Taxes and out-of-pocket payments are also progressive relative to consumption. The wealthiest 20 percent cover 74 percent of total health care payments, compared to 39 percent of consumption. Health spending among the poorest two quintiles is only 5 percent, while their share of consumption is 22 percent.

What are the policy implications?

1. **Continue improving the availability and quality of services at the frontline.** The poor use community health centers and mobile clinics more while the wealthy tend to seek care from hospitals. The availability and quality of services offered at the community health centers, health posts, and SISCA sites needs to be strengthened so patients, particularly the poor, can access quality primary care. Recently, a large number of Cuban trained Timorese doctors have returned and present a unique opportunity to significantly strengthen the primary health care system, especially in rural areas. This increase in the number of qualified health workers should be accompanied by better management of human resources and the creation of conducive environments for health care workers. The instruments include, but are not limited to: incentivizing good performance to reduce inefficiency such as total absenteeism and reduced working hours; providing basic infrastructure (e.g., water and electricity) and essential commodities (e.g., medicines and medical supplies); and taking measures to improve quality (e.g., step-wise quality accreditation system). Engaging community and empowering citizens to effectively monitor service delivery will also be imperative to ensure effective utilization of the services by citizens, particularly the poor.

2. **Improve accessibility of secondary care to the poor when needed.** The utilization of secondary care, which is largely publicly-subsidized, is pro-rich. In order for the poor to have better access to secondary care services, the up and down referral system between primary and secondary care levels needs to be strengthened. The major barriers for the poor to access secondary care might not be point of service user fees, but rather physical access to district and national hospitals. The government needs to explore options which can improve the poor's access to secondary care when clinically required by providing, for example, travel vouchers, or (partial) reimbursement of travel cost. Anecdotal evidence has shown that oversea referrals are pro-rich benefitting those who are economically and socially better off. Increased transparency on oversea referral programs is required to ensure the equitable allocation and utilization of resources.

3. **Monitor the impact of tightening fiscal space on public health spending on poor.** In the environment where fiscal space is tightening, the poor are usually more affected. The utilization of some essential health services that often incur out-of-pocket expenditure such as skilled delivery is much lower among the poor. This highlights the need for the government to closely monitor the impact of the tightening fiscal space on service utilization especially among the poor as well as the catastrophic out-of-pocket expenditures. The household surveys conducted by the MoH (e.g., DHS) and the MoF (e.g., TLSLS) can provide information to do so.

This section provides a brief overview of Timor-Leste's health system, focusing on features that are likely to be especially salient for equity and financial protection.

1.1. Equity and financial protection as policy goals

The Government of Timor-Leste is strongly committed to improving financial protection in health and improving equity. The following quote illustrates this commitment[1]:

> "The Mission of the Ministry of Health is to strive to ensure the availability, accessibility and affordability of health services to all East Timorese people, to regulate the health sector and to promote community and stakeholders participation…"
>
> Ministry of Health, Dili, Timor Leste

1.2. Health financing system

Health expenditure[2]

Timor-Leste spent US$ 82.1 (PPP) per capita on health or 5.1 percent of GDP in 2011[3]. Government spending on health as a share of government expenditures has been declining in recent years as a result of shifting government priorities. Health spending as a share of total government spending declined from 12 percent in 2005 to an estimated 4 percent in 2012 [4],[5],[6]. In 2011, this amounted to about US$ 58.1 (2011 PPP) or US$ 33.1(2011 current) per capita. External financing for the health sector, which may flow through government and private channels, increased from 38.2 percent of total health expenditures (THE) in 2007 to 50.8 percent in 2011[7].

Table 1.1: Health expenditure data, 2011

Indicator	
Health expenditure as share of GDP	5.1%
Government expenditure on health, per capita	US$33.1 (Current)
	US$58.7 (PPP adjusted)
Government expenditure on health as share of total health expenditures	71.5%[7]
Out-of-pocket (OOP) expenditure on health as share of total health expenditures	4.0%

Source: WHO National Health Accounts database (2013)

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[1]   Mission statement available at http://www.moh.gov.tl/?q=node/2, accessed 11/5/12

[2]   Data are from 2011 and available from the WHO Global Health Expenditure database, accessed 6/21/13

[3]   Ibid.

[4]   Timor-Leste Ministry of Finance Budget Portal, accessed 11/12/12.

[5]   Goods and Services as a share of total Goods and Services have dropped from about 13% to 4% between 2005 and 2012.

[6]   Without the human capital fund and infrastructure fund, the share of health is 6.4% and 6.2% in 2011 and 2012, respectively.

[7]   Note that external financing may be channelled through both the government and private sector. Thus, external financing and government financing may exceed 100%. Data are for 2011 and available from the WHO National Health Accounts database, accessed 6/21/13.

Centralization and revenue-raising/sources of funds

Health financing in Timor-Leste is highly centralized. Government spending accounted for 71.5 percent of total health spending as shown in Figure 1.1. In 2011, a large share or 80.8 percent of general government revenues came from the Petroleum Fund. Only 5.0 percent of revenues came from domestic taxes. Such heavy reliance on petroleum revenues makes the health sector vulnerable to petroleum price fluctuations and supply. External sources make up about a half of THE[8]. Generally, publicly provided health care is free at the point of service and thus out-of-pocket payments (OOPs) are low in comparison to other East-Asia and the Pacific countries[9]. OOPs in Timor-Leste account for 4.0 percent of THE, compared to 11.7 percent, 7.0 percent and 0.1 percent in PNG, Samoa and Tuvalu[10]. This includes OOPs on private sector health care. According to the 2007-2008 Timor-Leste Survey of Living Standard (TLSLS), most of those who incurred OOPs did so from visiting private sector. Most households (89 percent) that sought health care reported visiting a public health care provider and only three percent of visits to the public provider incurred a payment to the provider[11]. However, households that visited private providers were more likely to pay OOPs for their services. More than half of patients who went to private providers made a payment to a provider[12].

Figure 1.1: Health care financing mix, 2007-2011

Source: WHO National Health Accounts database (2013)

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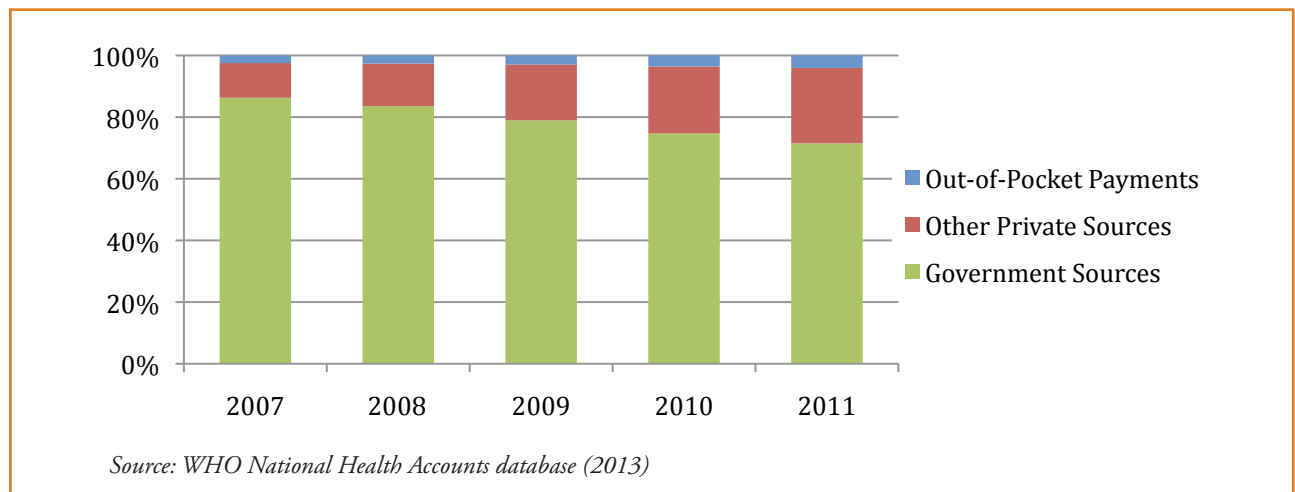
[8]   This indicates that external resources are channeled through both the public and private revenue sources.

[9]   Out-of-Pocket payments are typically direct spending after deducting third party payments such as insurance (WHO 2006) available at http://www.who.int/nha/methods/estimating_OOPs_ravi_final.pdf. The TLSMS includes payments for health care services and medicines as part of health spending.

[10] WHO National Health Accounts estimates (2013)

[11] According to Lewis (2010), the frequency of informal payments to public health care workers among users of health services vary widely from 3 percent in Peru to 96 percent in Pakistan. Informal payment in this study is defined as "payments to individual and institutional providers, in kind or in cash that are made outside official payment channels or are purchases meant to be covered by the health care system *including value of medical supplies purchased by patients and drugs obtained from private pharmacies but intended to be part of government-financed health care services,*"

[12] Nearly half of patients who went to private providers reported to pay nothing. This might be due to the fact that patients paid in-kind (e.g., chicken), and that the survey didn't capture that.

Comparison with other countries

Compared with other countries in East Asia, the share of public financing for the overall health expenditure is relatively high in Timor-Leste: government expenditure as a share of THE accounts for 71.7 percent in Timor, similar to Thailand (75.5 percent), but higher than Indonesia (34.1percent), Vietnam (40.4 percent) and Laos (49.3 percent).

Figure 1.2: Government expenditure on health as a share of THE, 2011

Source: World Development Indicator (WDI, 2014)
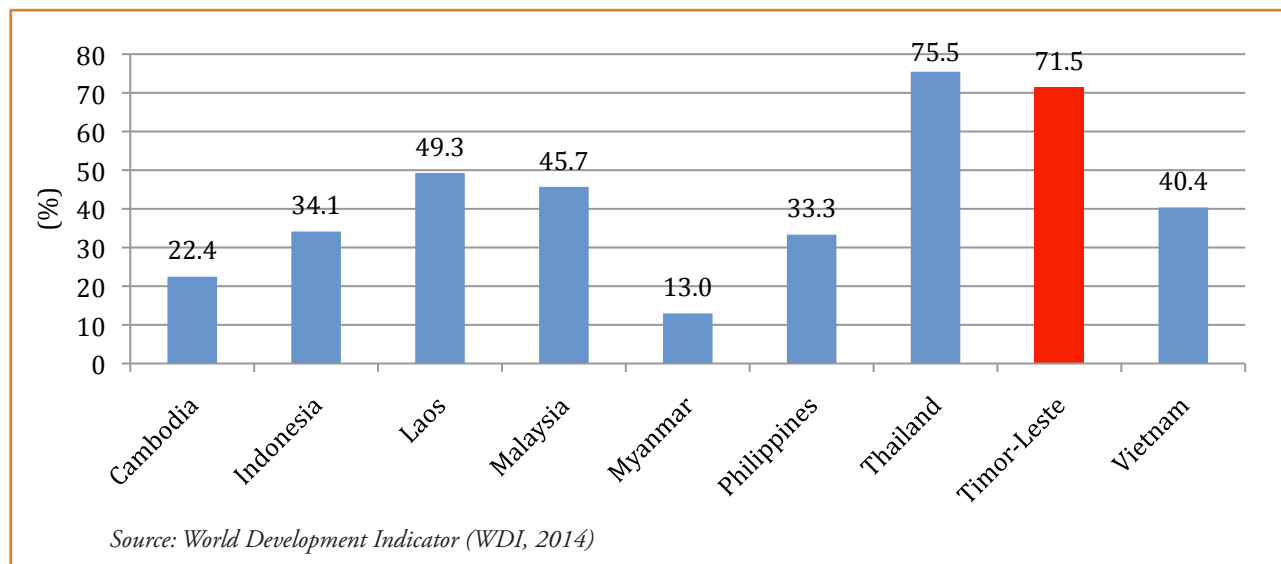
Government spending accounts for a large share of total health expenditure in Timor, but in absolute value, the amount is quite small compared to other countries in East Asia. The government needs to increase public health spending especially as the economy grows. Per capita government health expenditure in Timor (US$ 46) is only slightly better than Myanmar (US$ 23) and Laos (US$ 37) in parity purchasing power (PPP) term, but still much lower than Thailand (US$ 202) which achieved universal health coverage (Figure 1.3).

Figure 1.3: Government health expenditure per capita, 2011

Source: WDI (2014)
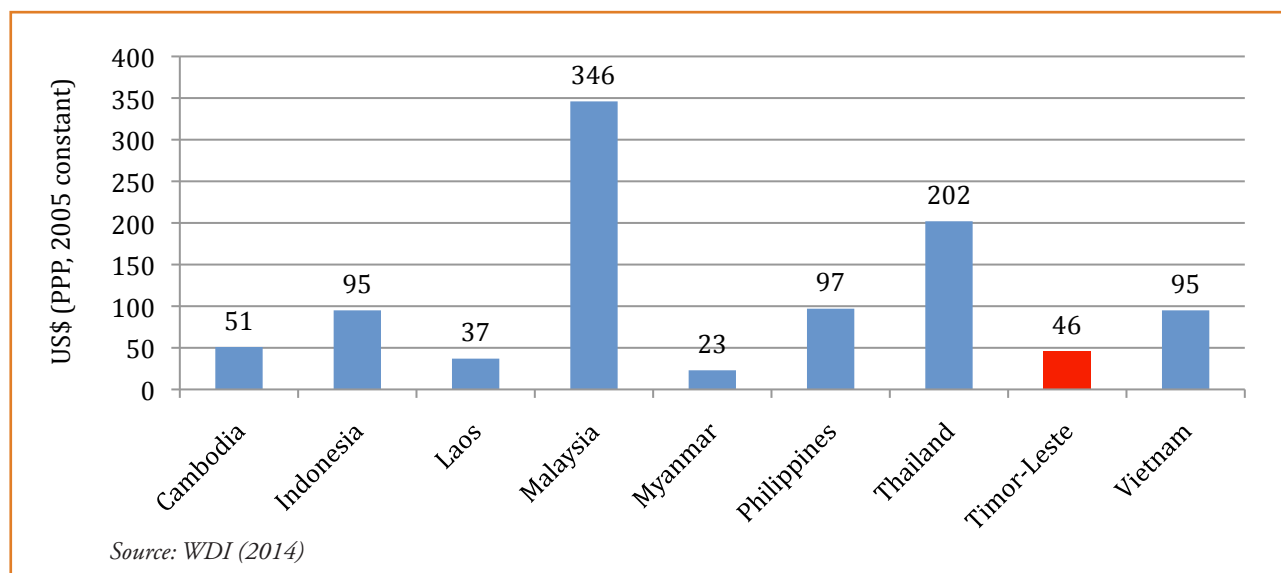
The public expenditure as a share of total government expenditure is also low compared to other countries, only 2.9 percent in Timor, slightly better than Myanmar (1.3 percent), far less than Thailand (14.5 percent). As noted earlier, this figure might be under-estimated given the share of health was 6.4 percent and 6.2 percent in 2011 and 2012 without human capital funding and infrastructure funding (footnote 6). However, this is still significantly lower than in 2005, at which time public health spending accounted for 12percent of total government spending in Timor. Yet, the argument to increase fiscal allocation on health is still thin given the projected limited government revenue growth in next few years, the competing demand from other sectors and the need for the health sector to show the effectiveness of resources spending in translation to improved health outcomes.

Figure 1.4: Public health expenditure as a share of government expenditure, 2011

Source: WDI (2014)
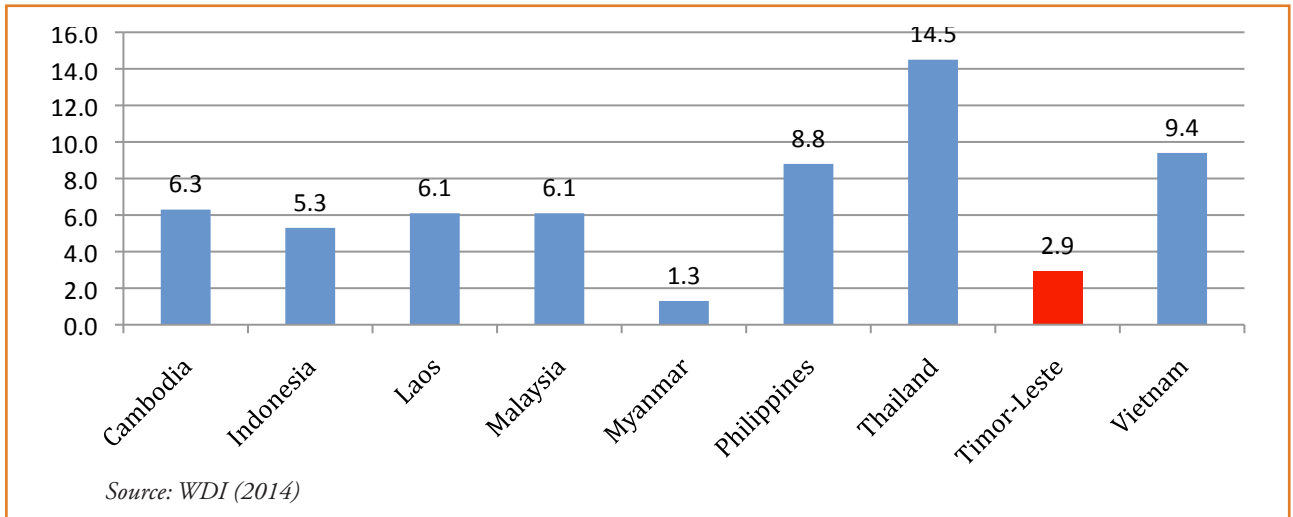
Government spending on health

Spending on the health sector mirrors national priorities on infrastructure development (Figure 1.5A and Figure1.5B). Recent and forecast health spending is concentrated on expansion and rehabilitation of hospital capital works projects. Minor and major capital development accounted for 33 percent of expenditures in 2010 but has recently decreased to about 16 percent in 2012. Salaries increased from 20 percent in 2008 to 35 percent in 2012; the absolute amount has more than doubled from US$ 6 million in 2008 to about US$ 16 million in 2012. During this period of time, the share of goods and services has been decreasing from about 59 percent in 2008 to 30 percent in 2012; with the absolute amount dropping from US$ 18 million in 2008 to US$ 14 million in 2012. There is no clear explanation as to why goods and services have gone down. The demand for health services is anticipated to increase. Therefore, goods and services, which account for a large part of the recurrent expenditures, should have increased. The observed decrease raises concerns regarding the effectiveness of service delivery at the frontline of services. In 2012, transfers accounted for 20 percent in the total budget, roughly US$ 10 million per year. It raises serious equity concerns given a large part of the transfers are for the oversea treatment, which the better-off are most likely to benefit from.

Figure 1.5A: Percent allocation of health budget items, 2008 - 2012
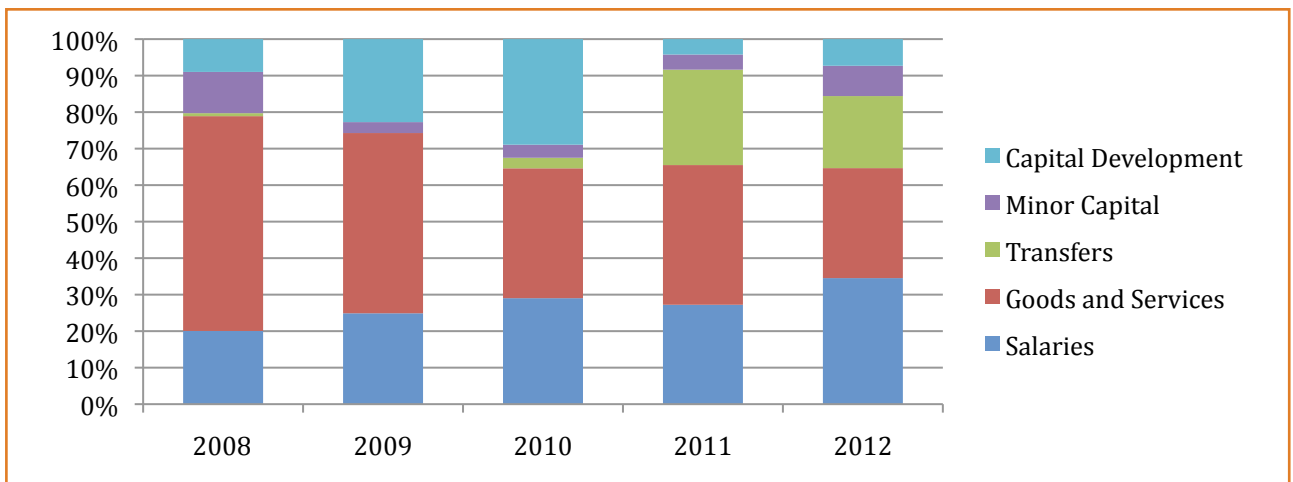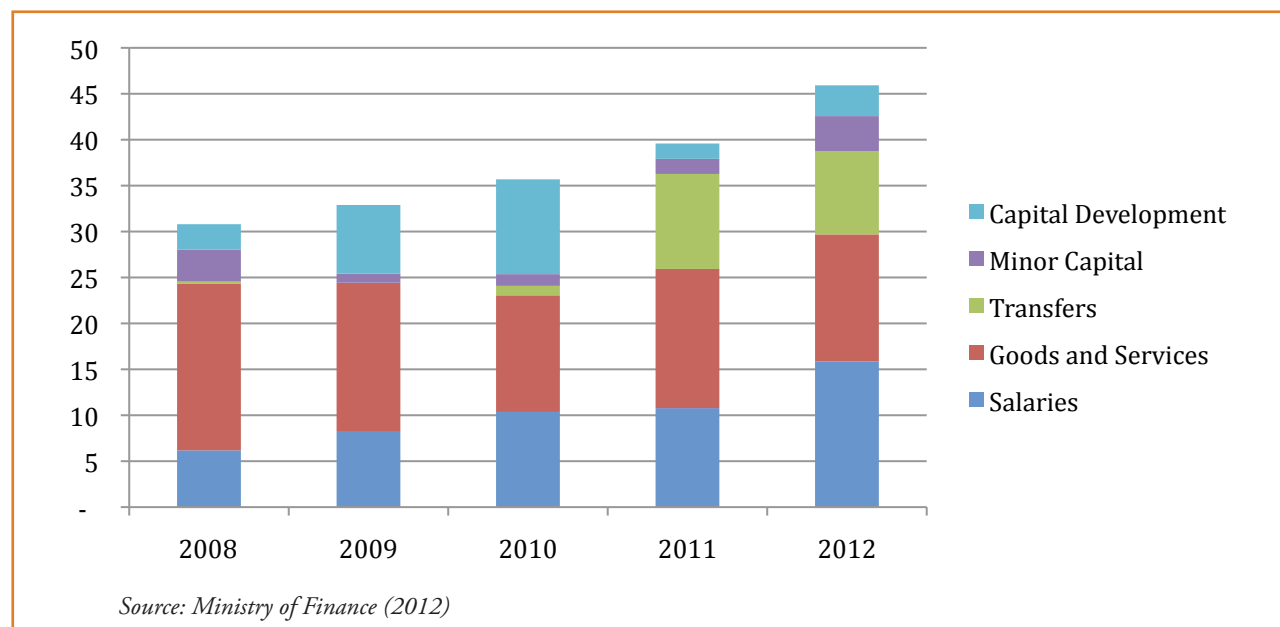
Figure 1.5B: Amount allocation of health budget items, 2008 – 2012 (US$, million)

Source: Ministry of Finance (2012)

1.3. Health care delivery system

Provider organization

The health sector is divided into four organizational levels: district health services, hospitals, Central services, and personalized services (i.e., (semi) autonomous agencies). District health services are primarily responsible for delivering the basic health service package. They operate 66 community health centers (CHCs), 192 health posts, mobile clinics as well as the *Sistema Integradu Saude Communitaria (SISCa)*. SISCa, introduced in late 2007, is a community based program that delivers preventative and curative health services, namely family registration, mother and child care, nutrition monitoring including food supplements, curative care and integrated vector control and health promoting activities. The distribution of health posts around the country is designed so that every citizen has a health facility within walking distance[13]. Sparsely populated areas are served by mobile clinics and SISCas. The district health services work with the Central services in implementing a wide range of programs such as child immunization, malaria and TB programs.

Hospitals deliver higher level health care through a chain of five referral hospitals[14] in the districts and one national hospital *(Hospital Nacional Guido Valadares: HNGV)* in Dili. Cases which cannot be treated at the district level are sent to the hospitals or in rare cases, transported overseas for treatment. Central services provide centralized administrative support as well as bulk purchasing services. Personalized services include the Institute of Health Sciences that provides research and in-service training, *Serviço Autónomo de Medicamentos e Equipamentos de Saúde* (SAMES; central medical store), and National Laboratory.

Payment mechanisms and provider autonomy

Health facilities are reliant on government financing allocated by the central ministry level. Facilities have no significant sources of internally generated funds (IGF). Only HNGV in Dili charges user fees for non-Timorese or VIP patients and was able to keep about 70 percent of its IGF (MoH 2009). The Ministry of Health (MoH) makes personnel decisions, limiting the level of provider autonomy.

Resource availability and utilization

Taking into account the imminent inflow of new doctors, a density of qualified health workers in Timor-Leste is getting close to the benchmark recommended by WHO by the end of 2013 (i.e., 2.35/1000 population)[15]. While about two-thirds of the clinical health workers were nurses and midwives (n≅1500), the situation is changing very quickly with a major inflow of young medical graduates who have finished their training in Cuba and elsewhere (n≅790). The density of doctors per district (without incoming doctors) varies significantly from 0.04 to 0.35, while that of nurses (0.4-1.4) and midwives (0.2-0.9) is a little better. The addition of new health workers will not only increase the density of health professionals by 0.5/1,000 population, but it will also increase the costs of service delivery. For example, it is expected that drug prescription costs will increase by $2/person/year based on the prescription pattern of skilled health workers. In addition, the MoH budgeted about $12m to cover additional salaries and allowances, equipment, housing, and training.

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[13] Walking distance is defined as a maximum of one hour. Due to the rough terrain in Timor, the bad conditions of many roads and the dispersed population, only between 40% and 50% of the population has a health facility within a one hour's walk. The rest has to walk at least two or even three hours to reach a health post.

[14] Baucau, Maliana, Suai, Oecussi and Maubesse

[15] World Bank. Human Resources for Health in Timor-Leste: a Rapid Assessment, Nov 2012

Most policymakers regard large inequalities in health outcomes between the poor and rich as undesirable. This section reports inequalities in child and adult health outcomes, as well as health behaviors.

2.1. Data availability

A Demographic and Health Survey (DHS) was fielded in Timor-Leste from 2009 to 2010. The DHS has rich information for many health outcomes, particularly in relation to maternal and child health (MCH). The DHS lacks consumption and income measures, but one can construct an "asset index" using principal components analysis to rank households from poorest to richest (see Filmer and Pritchett 2001).

2.2. Inequalities in health

The tables in this section show how health outcomes vary across asset (wealth) quintiles. The tables show the mean values of the indicator for each quintile, as well as for the sample as a whole. Also shown are the concentration indices (CI), which capture the direction and degree of inequality. A negative value indicates that the indicator takes higher values among the poor, while a positive index indicates that the indicator takes higher values among the better-off. The larger the index in absolute size, the more inequality there is.

Table 2.1 shows that infant and under-five mortality, stunting, and underweight are worse among the poor. However, diarrhea, acute respiratory infections (ARI) and fever are worse among the better-off. The 2007/08 TLSLS confirms that diarrhea and fever/malaria were self-reported at higher rates among the better-off. This may be because the better-off were better able to identify the symptoms associated with these childhood diseases than the poor. Better educated households reported higher rates of diarrhea, fever and ARI than less educated households (data not shown).

Table 2.1: Inequalities in child health, 2009/10

Child (<5 years) health	Q1	Q2	Q3	Q4	Q5	Total	CI
Infant mortality rate (per 1,000 live births)	67.8	74.0	62.3	60.2	39.8	60.7	-0.094***
Under-five mortality rate (per 1,000 live births)	98.2	106.8	94.9	92.2	58.1	89.4	-0.092***
Stunting (%)	61.2	63.3	58.6	55.3	46.5	57.1	-0.054***
Underweight (%)	49.3	48.6	47.2	41.7	35.6	44.6	-0.065***
Diarrhea (%)	13.2	13.7	15.2	19.0	17.4	15.7	0.065***
Acute respiratory infection (%)	2.7	3.9	4.2	4.8	4.2	3.9	0.084***
Fever (%)	16.2	16.9	18.5	23.2	21.9	19.2	0.073***

Source: Authors' estimates using ADePT and data from the 2009/10 Timor-Leste DHS

Note: Q1: Poorest Quintile, Q2: 2nd Poorest Quintile, Q3: Median Quintile, Q4: 2nd Wealthiest Quintile, Q5: Wealthiest

* CI is significant at 10%, **CI is significant at 5%, ***CI is significant at 1%.

Table 2.2 shows certain risk factors such as smoking are more concentrated among the poor for both men and women: Smoking rates among men are high at 70 percent, with higher prevalence of smoking concentrated among the poor. Smoking is not very prevalent among Timorese women, but higher among poor women. Less than one percent of non-pregnant women are obese. The prevalence of sexually transmitted diseases (STDs) among men is worse among the wealthy.

Table 2.2: Inequalities in adult health and risk factors, 2009/10

Adult (15-49 years) health and risk factors	Q1	Q2	Q3	Q4	Q5	Total	CI
Obesity among non-pregnant women (%)	0.5	0.6	0.6	1.0	1.6	0.9	0.269***
Anemia among women (%)	40.6	36.7	41.8	39.7	33.8	38.5	0.098***
Smoking among women (%)	6.7	5.1	4.5	3.7	3.5	4.6	-0.141***
Smoking among men (%)	73.3	73.9	70.4	68.5	61.3	69.5	-0.027***
STDs among men (%)	0.0	0.8	2.1	1.4	1.3	1.1	0.414***

Source: Authors' estimates using ADePT and data from the 2009/10 Timor-Leste DHS

Note: Q1: Poorest Quintile, Q2: 2nd Poorest Quintile, Q3: Median Quintile, Q4: 2nd Wealthiest Quintile, Q5: Wealthiest; Obesity: Body Mass Index >30

* CI is significant at 10%, **CI is significant at 5%, ***CI is significant at 1%.

In sum, the tables in this section indicate that children from poor households in Timor-Leste are disproportionately affected by ill health. Adverse adult risk behaviors such as smoking are concentrated among poorer households.

In many countries, for a variety of possible reasons, the pattern of health care utilization tends to be distributed unequally across income groups, even after taking into account differences in medical needs. This section reports on inequalities in utilization of health care in Timor-Leste for different types of care, and for different types of health care providers.

3.1. Data availability

As stated previously, a DHS was fielded in Timor-Leste from 2009 to 2010. The DHS has data on utilization of maternal and child health interventions. The DHS lacks consumption and income measures, but one can construct an "asset index" using principal components analysis to rank households from poorest to richest (see Filmer and Pritchett 2001).

3.2. Inequalities in health care utilization

The tables in this section show how health utilization varies across consumption or asset quintiles. The tables show the mean values of the indicator for each quintile, as well as for the sample as a whole. Also shown are the concentration indices which capture the direction and degree of inequality. A negative value indicates that the indicator takes higher values among the poor, while a positive index indicates that the indicator takes high values among the better-off. The larger the index in absolute size, the more inequality there is.

Table 3.1: Inequalities in maternal and child health interventions, 2009/10

Interventions	Q1	Q2	Q3	Q4	Q5	Total	CI
Full immunization (%)	43.4	52.9	56.5	64.9	45.5	52.6	0.030**
Treatment of diarrhea (%)	80.8	76.1	84.0	75.7	76.0	78.4	-0.011
Medical treatment of ARI (%)	53.2	66.8	75.6	73.2	73.6	69.6	0.054**
Mosquito net use by children (%)	23.9	34.0	42.7	56.9	55.9	42.3	0.167***
Skilled antenatal care (4+ visits) (%)	41.1	44.9	57.3	63.6	68.8	55.1	0.112***
Skilled birth attendance (%)	10.6	14.2	21.2	38.9	69.5	30.3	0.392***
Contraceptive prevalence (%)	9.2	9.5	9.9	14.6	17.8	12.4	0.153***
Mosquito net use by pregnant women (%)	27.1	32.3	39.8	59.7	54.6	42.2	0.155***

Source: Authors' estimates using ADePT and data from the 2009/10 Timor-Leste DHS

Note: Q1: Poorest Quintile, Q2: 2nd Poorest Quintile, Q3: Median Quintile, Q4: 2nd Wealthiest Quintile, Q5: Wealthiest

* CI is significant at 10%, **CI is significant at 5%, ***CI is significant at 1%.

Table 3.1 shows coverage of key MCH interventions, including the treatment of childhood illness is usually higher among the better-off. Around 53 percent of children are fully immunized, 70 percent of children with ARIs received medical treatment. Use of mosquito nets by children (and pregnant women) is about 42 percent with children from the wealthiest quintile twice more likely to use the nets than those from the poorest quintile. Inequalities in medical treatment of diarrhea among children under five are not statistically significant. About 55 percent of expectant women receive at least 4 skilled antenatal care visits but only 30 percent of women deliver their baby assisted by a skilled attendant. Women in the wealthiest quintile are 6.5 times more likely to deliver with a skilled attendant than women in the poorest quintile. This is consistent with what the report will discuss later on utilization of secondary care by income quintiles. The poor usually do not seek care at the secondary level. Another reason is that the fertility rate is quite high in Timor (5.7 on average according to DHS data). Use of a modern method of contraception is more prevalent for wealthy women.

Policymakers typically take the view that government health expenditure (GHE) ought not to disproportionately benefit the better-off, and if anything ought to favor the poor more than the better-off. Benefit-incidence analysis (BIA) shows whether and how far GHE disproportionately benefits the poor. This section reports BIA results for Timor-Leste, using three methods for allocating GHE to households, namely (i) the constant unit cost assumption, (ii) the constant unit subsidy assumption, and (iii) the proportional unit cost assumption. The first is arguably the least plausible of the three, since it implies that higher fees are not a reflection of more costly care (see Table 4.2). However, it does have the attraction of not needing to be modified if part of (general) GHE goes on demand-side subsidies through, for example, a conditional cash transfer for health.

In Timor-Leste, recurrent spending on services is allocated to two major areas: district health services and hospitals. Generally, spending on hospitals is pro-rich whereas spending on district health services is pro-poor. Overall total government spending on health favors the rich. The results presented below were obtained using the constant-unit-subsidy and proportional-unit-cost assumptions; it is assumed implicitly that supply- and demand-side subsidies have the same distributional impact.

4.1. Data availability

The two most recent Living Standards Measurement Surveys (LSMS) for 2007/08 and 2011/12 (i.e., 2007/08 TLSLS and 2011/12 HIES) provide data on utilization of health services. Government expenditure data at the hospital and district levels from the MoH and Ministry of Finance (MoF) provide information on the amount of subsidies to public health care.

While the 2011/12 HIES provides more recent data, it has some limitations. The 2011/12 HIES has combined out-of-pocket spending data on public hospitals and clinics. The 2011/12 survey also does not collect data on the frequency of visits to health care providers nor does it separate out utilization data by whether or not a visit was made to a public or private facility. It instead asks whether or not an individual in a household visited a provider in the last month. So there is potential bias in the utilization data if an income group tended to visit health care providers more frequently. Data on health care expenditures would also not serve as an indicator of utilization since health care is supposed to be free. Approximately three-fourths of all households that reported a member sought health care also reported zero health care expenditure.

On the other hand, the 2007/08 TLSLS captured frequency of data and separated out the category of health expenditures by provider category. However, the 2007/08 TLSLS provided overlapping categories of public providers in their dataset: doctor, nurse/paramedic, midwife in government health facility, mobile clinic, health posts, government community health center, and government hospital. For the 2007/08 analysis, providers were grouped into two categories: government hospitals and district visits. District-level visits are defined as all other public visits to a government facility other than hospital (i.e. doctor, nurse/paramedic, midwife in government health facility, mobile clinic, government sub-community health center, and government community health center).

Typically, a National Health Accounts (NHA) exercise provides detailed health financing data on various levels of care such as sub-community health centers, health posts, outpatient hospital care and inpatient hospital care. An NHA exercise has not been completed for Timor-Leste. Instead, the MoF's 2010 Review of the Health Sector and the MoH's 2009 update to the 2007 Medium Term Expenditure Framework (MTEF) provides recurrent and capital expenditures for hospitals and districts. For the purposes of this BIA, district recurrent expenditures are interpreted as total public outpatient subsidies and hospital recurrent expenditures as total public hospital subsidies[16].

4.2. Inequalities in benefit incidence

The tables in this section show the distribution across consumption quintiles of utilization for government facilities, fees paid to these facilities, and estimated subsidies to the health sector. The latter depend on the assumptions made to allocate subsidies to households; results are presented for three sets of assumptions. The tables show the shares of fees or shares of subsidies that go to each quintile. Also shown are the concentration indices which capture the direction and degree of inequality. A negative value indicates that the variable in question is higher among the poor, while a positive index indicates higher values among the better off. The larger the index in absolute size, there is more inequality in the indicator.

Table 4.1 shows the utilization of four types of public facilities separated in 2007/08. According to the 2007/08 TLSLS, the most frequently used type of service was the health post

with 0.333 visits per year per person on average. On the other hand, hospitals, with an average of 0.236 visits per year per person[17], were less frequently used. There is a striking contrast between the distribution of lower level health care services (sub-CHCs and mobile clinics) and use of general hospital services. Utilization of the former steadily decreases with income. The decrease is most noticeable for sub-CHCs, which drop from an average number of 0.445 visits for the poorest quintile to 0.219 for the highest. In contrast, hospital visits increase with levels of wealth. These patterns are reflected in their respective concentration indices. The concentration index of sub-CHCs, mobile clinics and CHCs are noticeably negative, indicating that use of this type of service is higher among the poor. By contrast, the concentration index of hospital visits is positive, indicating that richer individuals use this service more than the poor. The concentration index for CHCs was not statistically

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[16] Outpatient and inpatient subsidies are not distinguished in hospital subsidies. As a result, it is possible that we are underestimating outpatient subsidies because we do not account for the outpatient services delivered in the hospital setting.

[17] Note: According to the MoF review of the health sector, district visits are 1.7 per capita and hospital visits are 0.2 per capita.

significant. Data on utilization in 2011/12 is incomplete but analysis (not shown) reveals that the concentration index for all public health facility visits was slightly negative, indicating that the poor utilized public facilities more often than the wealthy.

Table 4.2 shows the inequalities in visits to individual health care providers. The wealthy are more likely to see midwives as demonstrated by the positive concentration index. The concentration indices of visits to nurses/paramedics and doctors across indicators are not statistically significant.

In 2007/08, fees or OOPs paid to see public providers averaged about US$ 0.4. This low mean is driven by a high number of patients who paid nothing at the point of service. Among those who did see public providers, 97 percent paid nothing. But among the patients who went to a public provider and reported paying for services, they paid on average about US$ 11.7.

Table 4.1: Inequalities in use of public facilities (visits per capita per year), 2007/08

Quintile	Sub-CHC	Mobile Clinic	CHC	Hospital
Poorest	0.445	0.134	0.174	0.179
2nd poorest	0.366	0.119	0.208	0.200
Median/middle	0.351	0.119	0.183	0.234
2nd wealthiest	0.288	0.102	0.172	0.255
Wealthiest	0.219	0.096	0.186	0.313
Total	0.333	0.114	0.185	0.236
Concentration Index	**-0.139*****	**-0.074****	**-0.003**	**0.118*****

Source: Authors' estimates using ADePT and data from the 2007/08 TLSLS

Note: * CI is significant at 10%, **CI is significant at 5%, ***CI is significant at 1%.

Table 4.2: Inequalities in use of public providers (visits per capita per year), 2007/08

Quintile	Midwives	Nurses/Paramedic	Doctors
Poorest	0.036	0.148	0.063
2nd poorest	0.039	0.168	0.060
Median/middle	0.054	0.131	0.065
2nd wealthiest	0.055	0.140	0.051
Wealthiest	0.068	0.125	0.063
Total	0.051	0.142	0.060
Concentration Index	**0.137*****	**-0.040**	**-0.007**

Source: Authors' estimates using ADePT and data from the 2007/08 TLSLS

Note: * CI is significant at 10%, **CI is significant at 5%, ***CI is significant at 1%.

Table 4.3 shows the share of fees paid to district and hospital facilities in 2007/08 and all public facilities in 2011/12. In 2007/08, visits to health care providers in the TLSLS were categorized such that all visits to hospitals were categorized as public inpatient visits but could potentially include outpatient visits. All other visits including visits to doctors, midwives and nurses were categorized as outpatient visits but could potentially include visits to hospitals. In 2011/12, data on utilization was not clearly separated between public and private

facilities but data on expenditures was disaggregated between public and private health facilities. Visits that were categorized as public hospital and clinic facility visits include all reported visits minus visits associated with positive payments to a private facility and visits to a traditional medical practitioner. It is possible that this utilization number still includes visits to a private provider in which no payments were reported. Based on this categorization, there appears to be a positive relationship between wealth and fees paid for public services.

Table 4.3: Distribution of fees paid to public facility (%), 2007/08 & 2011/12

	2007/08		2011/12
Quintile	District level	Hospital	Hospital & Clinic
Poorest	2.2	1.4	0.1
2nd poorest	11.2	0.8	3.3
Median/middle	22.3	14.8	6.3
2nd wealthiest	22.8	8.1	7.9
Wealthiest	41.6	74.9	82.5
Concentration Index	**0.4079*****	**0.6954*****	**0.6989†**

Source: Authors' estimates using ADePT and data from the 2007/08 TLSLS and 2011/12 HIES; District level facilities includes CHCs, sub-CHCs and mobile clinics

Note: * CI is significant at 10%, **CI is significant at 5%, ***CI is significant at 1%,† Standard error not computed; Data in 2007/08 reflect results after removing a household outlier.

Table 4.4 shows the incidence of government health spending. The first two lines of the table show how aggregate government spending on health varies across hospital and district level services[18]. The table contains three sets of estimates of subsidy distribution across consumption quintiles. The first assumption is the constant unit cost assumption in which each visit at a specific level of care cost the same amount irrespective of the different services provided (e.g. the hospital inpatient costs for an uncomplicated child delivery would be treated the same as the costs for a caesarean). This would be calculated by taking the total costs of service (i.e. subsidies plus user fees) divided by the number of units of utilization. This method however can result in negative imputed subsidies since the user fees paid for services may exceed the unit cost of service. To address this, any negative imputed subsidies are set to zero. The second type of assumption is that the unit subsidy is constant, irrespective of the user fees. It is just calculated as the total subsidy divided by the units of utilization. The third assumption is the proportional cost assumption. It assumes that the size of subsidies is proportional to the size of user fees. This implies that the size of user fees reflects the case complexity and therefore cost of services provided.

The first two lines indicate that 43 percent of recurrent government subsidies are spent on public hospitals and 57 percent is spent at the district level. The first set of results (based on the constant unit-cost assumption) for 2007/08 shows that the poorest quintile receives on average 15.3 percent of government health spending while the richest quintile receives 26.1 percent. The corresponding concentration index (0.1111) is slightly positive. Although district-level utilization is slightly pro-rich, the overall pro-rich result is mainly due to the effects of public spending in hospitals which are pro-rich. When unit subsidies are assumed to be constant (the second set of results), the subsidies become slightly more pro-rich with a concentration index of 0.1233. Finally, when unit costs are assumed to be proportional to the amount spent OOP, the subsidies for all types of services become considerably pro-rich. The resulting picture is a strongly pro-rich incidence of public spending that is driven by considerably pro-rich subsidies to hospital services.

For 2011/12 data on total public health spending, we see that concentration indices for both the constant unit cost and unit subsidy assumptions are slightly negative but insignificant, making payments somewhat proportional across quintiles. However, the proportional cost assumption appears to be pro-rich. The top two quintiles capture about 90 percent of government subsidies to the health sector.

Taken together, these benefit incidence analyses find no absolute evidence that government spending on health favors the poor. On the contrary, if one assumes that higher fees also reflect higher subsidies, one would conclude that government spending is, in fact, very much pro-rich and worsening when compared to 2007/08. When using the other assumptions, one also finds that total subsidies favor the better-off in 2007/08 and are proportional in 2011/12, an improvement from 2007/08. Therefore, the assumptions are critical to interpreting whether or not the 2011/12 data reflect a worsening in the benefit incidence.

Table 4.4: Inequalities in the incidence of government health spending (%), 2007/08 & 2011/12

	2007/08			2011/12
	Districts	**Hospitals**	**Total**	**Total**
Total Subsidies (US$, million)	7.8	5.9	13.7	19.5
Share of Total Subsidy	56.9	43.1	100.0	100.0
Constant Unit Cost Assumption				
Poorest	18.5	12.9	15.3	18.4
2nd poorest	20.7	13.9	16.9	22.7
Median/middle	20.5	21.1	20.9	21.6
2nd wealthiest	20.5	21.1	20.8	14.7
Wealthiest	19.8	30.9	26.1	22.6
Total	100.0	100.0	100.0	100.0
Concentration Index	**0.0328*****	**0.2119*****	**0.1111*****	**-0.0249**
Constant Unit Subsidy Assumption				
Poorest	18.0	12.4	14.8	18.4
2nd poorest	20.5	13.5	16.5	22.6
Median/middle	20.4	21.1	20.8	21.6
2nd wealthiest	20.7	21.4	21.1	14.7
Wealthiest	20.4	31.6	26.8	22.7
Total	100.0	100.0	100.0	100.0
Concentration Index	**0.0441*****	**0.2248*****	**0.1233*****	**-0.0237**
Proportional Cost Assumption				
Poorest	2.2	1.4	1.7	0.1
2nd poorest	11.2	0.8	5.3	3.3
Median/middle	22.3	14.8	18.1	6.3
2nd wealthiest	22.8	8.1	14.4	7.9
Wealthiest	41.6	74.9	60.5	82.5
Total	100.0	100.0	100.0	100.0
Concentration Index	**0.4079*****	**0.6954*****	**0.5504*****	**0.7007*****

Source: Authors' estimates using ADePT and data from the 2007/08 TLSLS and 2011/12 HIES. The MoF's 2010 Review of the Health Sector and the MoH's 2009 update to the 2007 Medium Term Expenditure Framework (MTEF) provides recurrent and capital expenditures for hospitals and districts.

Note: * CI is significant at 10%, **CI is significant at 5%, ***CI is significant at 1%, † Standard error not computed; Data in 2007/08 reflect results after removing a household outlier.

[18] It would be preferable to categorize the level of services as inpatient and outpatient services. However, the financial data from the MoH is reported as hospital and district services. Districts are expected to be responsible for primary care services while hospitals are responsible for inpatient services. However, it is possible that, without an effective gatekeeper system, care provided at hospitals may include outpatient services. Or, because of limitations in transport, districts may be providing inpatient services.

Countries finance their health care through a mix of OOPs, private and social insurance, general revenues, and international development assistance. Therefore, the goal of health systems is not just to improve health but also to ensure that people are protected from the financial consequences of illness and death, or at least from the financial consequences of having to obtain medical care. This section presents data on two alternative measures of financial protection, one that considers whether OOPs is 'catastrophic', and the other that considers if it is 'impoverishing'. Neither captures the income losses associated with illness, and both therefore underestimate the full financial impact of ill health on households. The section also explains the institutional arrangements used in Timor-Leste to provide financial protection in the health sector, and presents data on levels of inequalities in coverage.

5.1. Data availability

Two LSMS were fielded in Timor-Leste from 2001 to 2002, from 2007 to 2008, and in HIES from 2011 to 2012. They provide data on health care spending as well as household total and non-food consumption.

5.2. Catastrophic out-of-pocket payments

This subsection provides information on 'catastrophic' health payments. Catastrophic payments are defined as health care payments in excess of a predetermined percentage of the total household or nonfood spending.

The columns of Table 5.1 give different thresholds above which health payment "budget shares" might be deemed catastrophic. The first line of the table displays the catastrophic payment "headcount", i.e. the proportion of households with a health payment budget share greater than the given threshold. The second line relates the catastrophic payment headcount to the household consumption distribution, and shows the concentration index of the incidence of catastrophic payments. A positive value of the concentration index indicates a greater tendency for the better-off to have OOPs in excess of the payment threshold, whereas a negative value indicates that the poor are more likely to have OOPs exceeding the threshold.

The information in Table 5.1 on catastrophic payments is for the 2001/02 TLSLS, 2007/08 TLSLS, and 2011/12 HIES. According to the 2011/12 HIES data, when the threshold is raised from 5 to 40 percent of total household expenditure, the estimate of the incidence of catastrophic payments falls from 2.7 to 0 percent. However, using non-food expenditure, the estimate of the incidence of catastrophic payments falls from 13.4 to 2.7 percent. These results are similar to the 2007/08 TLSLS and 2001/02 TLSLS, based on total consumption. Based on non-food consumption the level of catastrophic payments in 2011/12 has improved. When the threshold is raised from 5 to 40 percent of total household expenditure, the estimate of the incidence of catastrophic payments falls from a level of 3.7 percent to about 0 percent in the 2001/02 TLSLS; it falls from 1.9 percent to about 0 percent in the 2007/08 TLSLS. Catastrophic payments are concentrated among the rich for all thresholds based on total consumption in 2011.

Table 5.1: Incidence of catastrophic out-of-pocket spending, 2001/02, 2007/08 & 2011/12

	Threshold share of total household consumption				
	5%	**10%**	**15%**	**25%**	**40%**
2001/02 TLSLS					
Headcount	3.7	1.3	0.7	0.3	0.0
Concentration Index	**0.043**	**0.061**	**-0.035**	**0.697*****	**0.000†**
2007/08 TLSLS					
Headcount	1.9	0.4	0.2	0.0	0.0
Concentration Index	**0.244*****	**0.155**	**0.212**	**0.965*****	**0.000†**
2011/12 HIES					
Headcount	2.7	0.9	0.4	0.2	0.0
Concentration Index	**0.572*****	**0.663*****	**0.631*****	**0.677*****	**0.000†**
	Threshold share of non-food consumption				
	5%	**10%**	**15%**	**25%**	**40%**
2001/02 TLSLS					
Headcount	25.6	22.7	20.7	17.1	14.2
Concentration Index	**0.048**	**0.010**	**-0.036**	**-0.079****	**-0.121*****
2007/08 TLSLS					
Headcount	21.9	15.2	10.6	6.7	3.9
Concentration Index	**-0.024**	**-0.016**	**-0.055**	**-0.079***	**-0.022**
2011/12 HIES					
Headcount	13.4	9.6	7.4	4.2	2.7
Concentration Index	**0.401*****	**0.365*****	**0.376*****	**0.382*****	**0.400*****

Source: Authors' estimates using ADePT and data from the 2001-2002 and 2007-08 TLSLS; 2011/2012 HIES

Notes: * CI is significant at 10%, **CI is significant at 5%, ***CI is significant at 1%, † Standard error not computed.

5.3. Impoverishing out-of-pocket payments

This subsection presents poverty measures corresponding to household consumption gross and net of OOPs. A comparison of the two shows the scale of impoverishment due to health payments. The idea is that a health problem necessitating OOPs may be serious enough to push a household from being above the poverty line before the health problem to being below the poverty line after the health problem. Adding OOPs to the household's nonmedical consumption (consumption including – or gross of – health payments) gives us a sense of what the standard of living would have been without the health problem. The nonmedical spending (consumption excluding health payments) gives us a sense of what the standard of living looks like with the health problem. The assumption here is that OOPs are involuntary and caused by health "shocks"; health spending is assumed to be financed by reducing current consumption.

The first line of Table 5.2 shows the poverty "headcount" which represents the proportion of population living below the poverty line at $1.25/day (PPP). The poverty gap is the aggregate of all shortfalls from the poverty line. The normalized

poverty gap is obtained by simply dividing the poverty gap by the poverty line; this is useful when making comparisons across countries with different poverty lines and currency units. Finally, the normalized mean positive poverty gap is a measure of the intensity of poverty, calculated by dividing the average poverty gap of the poor by the poverty line.

Table 5.2 reports results for the 2001/02 TLSLS, the 2007/08 TLSLS and the 2011/12 HIES. Health expenditure has been an insignificant driver of poverty: 22.5 percent, 35.7 percent, and 44.1 percent of the population was poor using the $1.25/Day line in 2001/02, 2007/08, and 2011/12, respectively. If we take OOPs out from the household's consumption, recognizing that this expenditure is involuntary and simply enables a household to cope with a health problem, the poverty rate goes up to 22.9 percent, 36.1 percent, and 44.3 percent during the same period. Thus 0.4 percent of the population or less would not have been poor if the resources they were forced to devote to health care had been available to spend on other things.

Table 5.2: Impoverishment through out-of-pocket health spending, 2001/02, 2007/08, & 2011/12

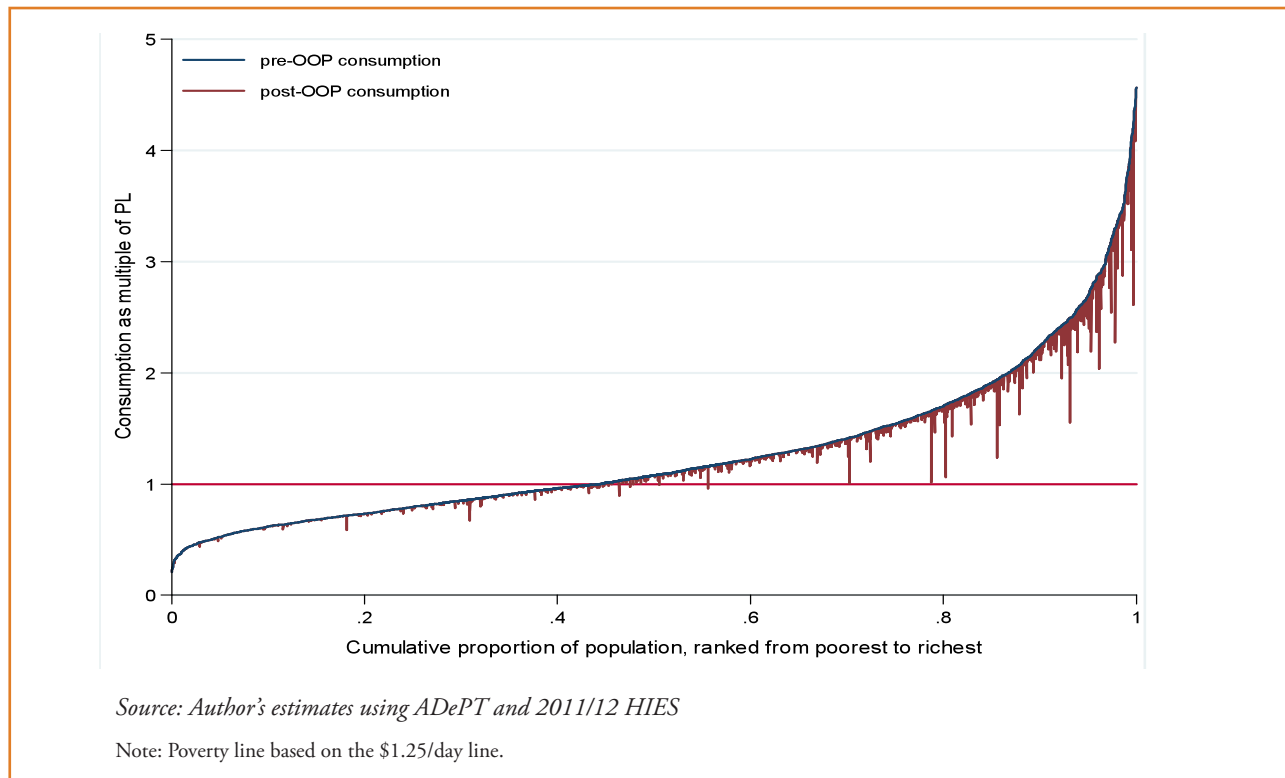|	Consumption including health payments	Consumption excluding health payments	Absolute change	Percentage change
2001/02 TLSLS				
Poverty Headcount	22.5%	22.9%	0.34pp	1.50%
Poverty Gap	$0.7	$0.7	$0.01	1.28%
Normalized Poverty Gap	$5.8	$5.9	$0.07	1.28%
Normalized Mean Positive Poverty Gap	$25.7	$25.9	$0.23	0.88%
2007/08 TLSLS				
Poverty Headcount	35.7%	36.1%	0.33pp	1.93%
Poverty Gap	$1.7	$1.7	$0.03	1.88%
Normalized Poverty Gap	$7.8	$7.9	$0.15	1.88%
Normalized Mean Positive Poverty Gap	$21.8	$22.0	$0.21	0.96%
2011/12 HIES				
Poverty Headcount	44.1%	44.3%	0.13pp	0.00%
Poverty Gap	$3.7	$3.7	$0.02	0.01%
Normalized Poverty Gap	$11.1	$11.2	$0.06	0.01%
Normalized Mean Positive Poverty Gap	$25.3	$25.3	$0.06	0.00%

Source: Authors' estimates using ADePT and data from the 2001/02, and 2007/08 TLSLSs and 2011/12 HIES.

Note: Poverty line based on the $1.25/day line; pp: percentage point.

Figure 5.1 shows the effect of OOPs on poverty via a "Pen's parade". Households are lined up in ascending order of their consumption including OOPs. The vertical "paint drips" show the extent to which OOPs divert a household's spending away from items such as food, education, clothing, etc. The length of the paint drip, therefore, shows how far health spending compromises a household's living standards.

In sum, the analyses in this section do not find high levels of catastrophic health expenditure. To the extent that they are present, catastrophic payments are found to be concentrated among the wealthy[19]. With regards to impoverishment, the data indicate that health spending hardly increases the absolute number of the impoverished. Indeed, the increase in the poverty rate due to health spending is around 0.5 percent when using the $1.25/day line.

Figure 5.1: The impoverishing effect of out-of-pocket spending

Source: Author's estimates using ADePT and 2011/12 HIES

Note: Poverty line based on the $1.25/day line.

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[19] This could be a function of many possible factors, but the existing data do not provide concrete answers on why catastrophic payments are found to be concentrated among the wealthy. For example, a health financing system provides good financial protection for the poor, the utilization rates of the health system by the poor are low, or the wealthy are using more expensive services. The 2007/08 utilization data show that the wealthy do use (potentially more expensive) hospital services more frequently.

There is a general consensus that payments for health care ought to be at least proportional to households' ability to pay, if not progressive (meaning a poor household contributes a smaller share of its resources than a rich one). The overall progressivity of a health financing system depends on the progressivity of each source of finance, and the share of health spending financed through each source. A system that relies exclusively on OOPs is likely to be regressive, since OOPs often absorbs a larger share of a poor household's resources than of a rich household's resources.

This is not always the case, as it is likely that the poor are under-using health care, something that can be assessed by the distribution of health utilization.

6.1. Data availability

The 2001/02 TLSLS, 2007/08 TLSLS and 2011/12 HIES provide data on household consumption, OOPs and tax payments by tax type. The MoF provides data on revenues for general government financing. There is no dedicated tax to finance the health sector. It is assumed that individual's tax contributions at the national level are proportional to the taxes for the health sector.

6.2. Progressivity of health care financing

The first five rows of Table 6.1 show each quintile's average consumption and financing share with households ranked in ascending order of gross consumption (i.e. consumption including health care payments). Health care payments are considered progressive if the poorest quintile's share in total household consumption exceeds its share in total payments, while the opposite is true of the richest quintile. Payments are regressive if the poorest quintile's share in total consumption is less than its share in total payments. Again, the opposite is true of the richest quintile. This exercise can be done for total health care payments, as well as for each source separately.

Table 6.1 shows the Gini coefficient, which measures the degree of inequality in gross consumption—the higher the number, the more unequal the distribution of consumption. The line below that shows the concentration index, a measure of how unequally distributed health care payments are across consumption quintiles; a positive value indicates that payments are concentrated among the better off quintiles, while a negative index would indicate a concentration of payments among the poorer quintiles. The next line shows the Kakwani index, defined as the concentration index less the Gini coefficient. A positive value indicates that payments are more concentrated among the better-off than consumption is and is a sign that payments are progressive. A negative Kakwani index indicates that payments are regressive. Finally, the table indicates the size of the "redistributive effect" associated with health care payments. This is the change in consumption inequality brought about by health care payments. A positive number indicates that there was less inequality in consumption after payments than before, which is the case if payments are progressive. The more progressive they are, and the larger the fraction of (gross) consumption accounted for health care payments, the larger the amount of the "redistributive effect".

Table 6.1 shows that health care financing in Timor-Leste has been progressive (i.e. health payments are progressive relative to consumption) in 2001/02, 2007/08 and 2011/12, as indicated by the positive Kakwani index results. Timor-Leste has a high degree of inequality with a Gini coefficient of 0.292 in 2011/12, which is comparable to 0.297 in 2007/08, and an improvement from 0.403 in 2001/02. This indicates that the wealthy consume a large share of all the goods and services. For example, the wealthiest quintile consumes 38.7 percent of all goods and services, almost as much as the poorest 60 percent who consume 39.1 percent of all goods and services in 2011/12.

For the health system to be progressive, the wealthy should be paying more than their share of total consumption in taxes and OOPs. In 2011, the Kakwani index was 0.385 indicating a progressive health system. The wealthy paid 73.6 percent of the total taxes and OOPs received by the health system, compared to 38.7 percent of consumption, making the health system progressive. This is an increase in progressivity from 2007/08 which had an overall positive but not statistically significant Kakwani index of 0.045. In 2007/08, the wealthiest quintile consumed 39.1 percent of all goods and services, higher than the poorest 60 percent who consumed 38.8 percent of all goods and services. In 2007/08, the health system was neutral to progressive, as the wealthy paid proportionate to their share through both taxes and OOPs.

In 2011, each component of the public's financing for the health system, taxes and OOPs were progressive too. The wealthy pay more in taxes and OOPs and the distribution of the burden of taxes and OOPs is progressive relative to the distribution of consumption. The Kakwani index provides an indicator of the depth of progressivity. OOPs have a similar Kakwani index to taxes which suggests that OOPs and taxes are both progressive.

While taxes and OOPs constitute a small fraction of the total revenues to the health sector, it is still important to note that taxes and OOPs in Timor-Leste are progressive relative to consumption. Compared to previous years, the data in 2011/12 HIES show that the tax system and OOPs have become significantly more progressive. Overall, payments to the health system have become more progressive.

Table 6.1: Progressivity of health finance

	Consumption	Taxes (from household)	Out-of-Pocket health Spending	Total Payments
2001/02 TLSLS				
Poorest	6.6	0.3	7.5	3.8
2nd poorest	10.6	0.3	4.2	2.2
Median/middle	14.5	0.3	15.4	7.7
2nd wealthiest	20.8	2.8	22.3	12.4
Wealthiest	47.6	96.3	50.5	73.8
Gini Coefficient	0.403***			
Concentration Index		0.878***	0.438***	0.662***
Kakwani Index		0.475***	0.035	0.259***
Redistributive Effect	0.4031	0.0012	0.0001	0.0013
2007/08 TLSLS				
Poorest	9.1	15.7	9.0	10.3
2nd poorest	13.0	1.3	10.5	8.7
Median/middle	16.7	6.2	19.0	16.4
2nd wealthiest	22.1	18.3	23.6	22.5
Wealthiest	39.1	58.4	38.0	42.1
Gini Coefficient	0.297***			
Concentration Index		0.457***	0.312***	0.342***
Kakwani Index		0.160	0.016	0.045
Redistributive Effect	0.297	0.0003	0.0000	0.0003
2011/12 HIES				
Poorest	9.2	1.4	0.8	1.1
2nd poorest	13.2	4.2	3.6	3.9
Median/middle	16.8	4.5	6.2	5.4
2nd wealthiest	22.2	12.6	19.2	16.1
Wealthiest	38.7	77.4	70.2	73.6
Gini Coefficient	0.292***			
Concentration Index		0.672***	0.681***	0.677***
Kakwani Index		0.380***	0.389***	0.385***
Redistributive Effect	0.2917	0.0032	0.0074	0.0105

Source: Distribution of consumption, taxes and OOPs estimated by authors using ADePT and data from the 2001/02 TLSLS, 2007/08 TLSLS and 2011/12 HIES.

Notes: * Significant at 10%, **Significant at 5%, ***Significant at 1%. NHA weights for 2001/02 TLSLS applied 2.6% for OOPs and 2.7% for taxes. NHA weights for 2007/08 TSLS applied 2.6% for OOPs and 1.7% for taxes. NHA weights for 2011/12 HIES applied 4% for OOPs and 3.6% for taxes. Official Gini coefficient is 0.3193 for 2007/08.

This section will compare the equity measures of the four key indicators with other comparator countries: infant mortality rate, under-5 mortality, skilled antenatal care (4+ visits), and skilled birth attendance. These indicators are closely related to Millennium Development Goals (MDGs) on reducing child mortality and improving maternal health. It also reflects both health outcomes and the health service utilization. Three countries were selected for comparison purposes based on geographical closeness, similar survey years, and per capita GDP level.

The variations across the quintiles are smaller in Timor for both infant mortality and under-5 mortality rates, as compared to the other three countries. Negative Concentration Index (CI) indicates poor households have higher infant mortality and under-5 mortality rates. Timor seems relatively equitable when considering these two indicators because the CI is closer to 0 in both indicators as compared to other countries. However, this more "equitable" outcome is mainly driven by the fact that even the better-off quintiles suffer from higher infant mortality and under-5 mortality rates. In general, this relates to the low living standard and weakness in the overall health delivery system in Timor.

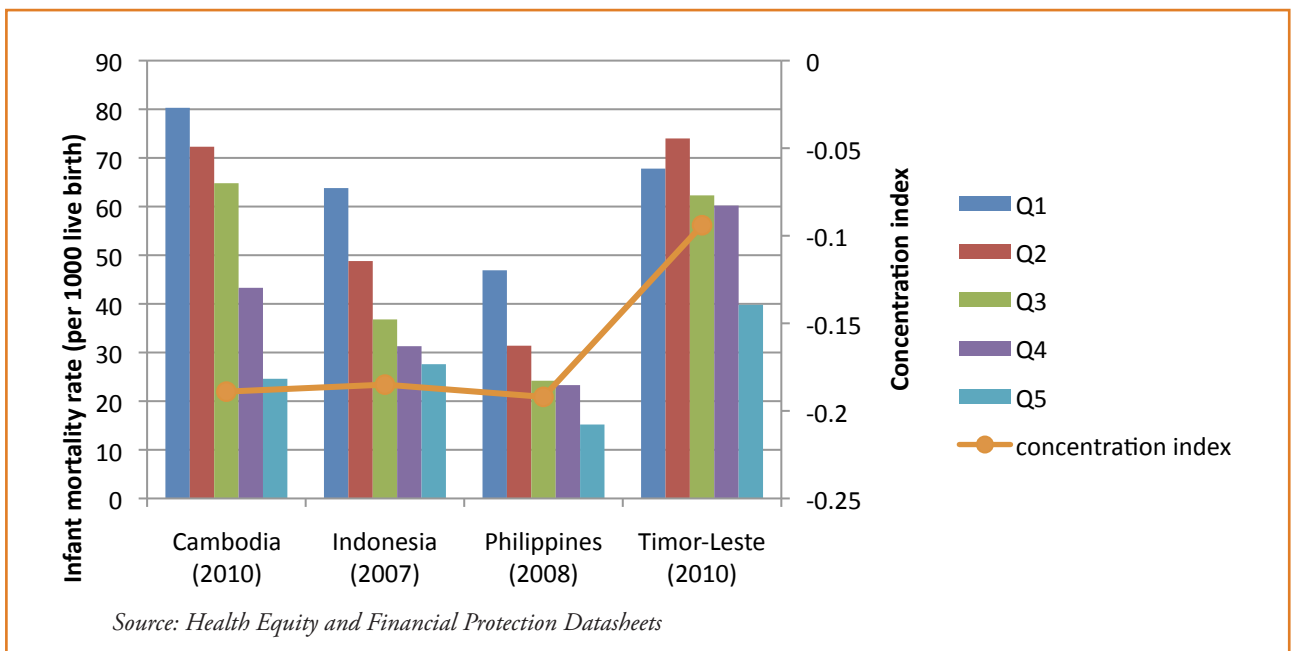**Figure 7.1. Comparison with other countries on infant mortality rate (per 1000 live births)**
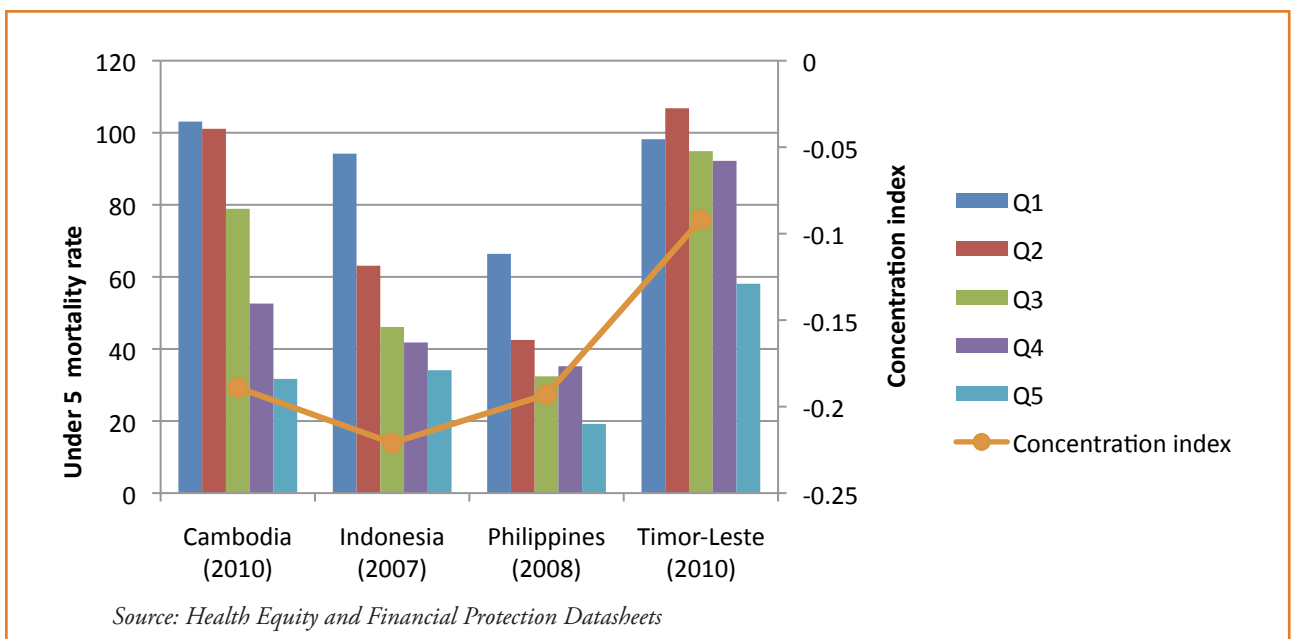

Source: Health Equity and Financial Protection Datasheets

Figure 7.2. Comparison with other countries on under-5 mortality rate (per 1,000 live births)

Source: Health Equity and Financial Protection Datasheets

Timor's antenatal care also seems more equitable than the other countries (Figure 7.3). The positive CIs show that the antenatal utilization is in favor of the rich, that is, women who are better off are more likely to receive antenatal care in all four countries. Compared with the three other countries, the distribution of this indicator seems slightly more equitable in Timor-Leste, because the absolute CI is closer to zero.

However, huge inequality exists in Timor in terms of skilled birth attendance (Figure 7.4). Compared with other countries, Timor-Leste has the highest CI at the value of 0.4, showing the skilled birth attendance is strongly in favor of the rich. The results confirm the earlier findings that the bottom quintiles were much less likely to use secondary care.

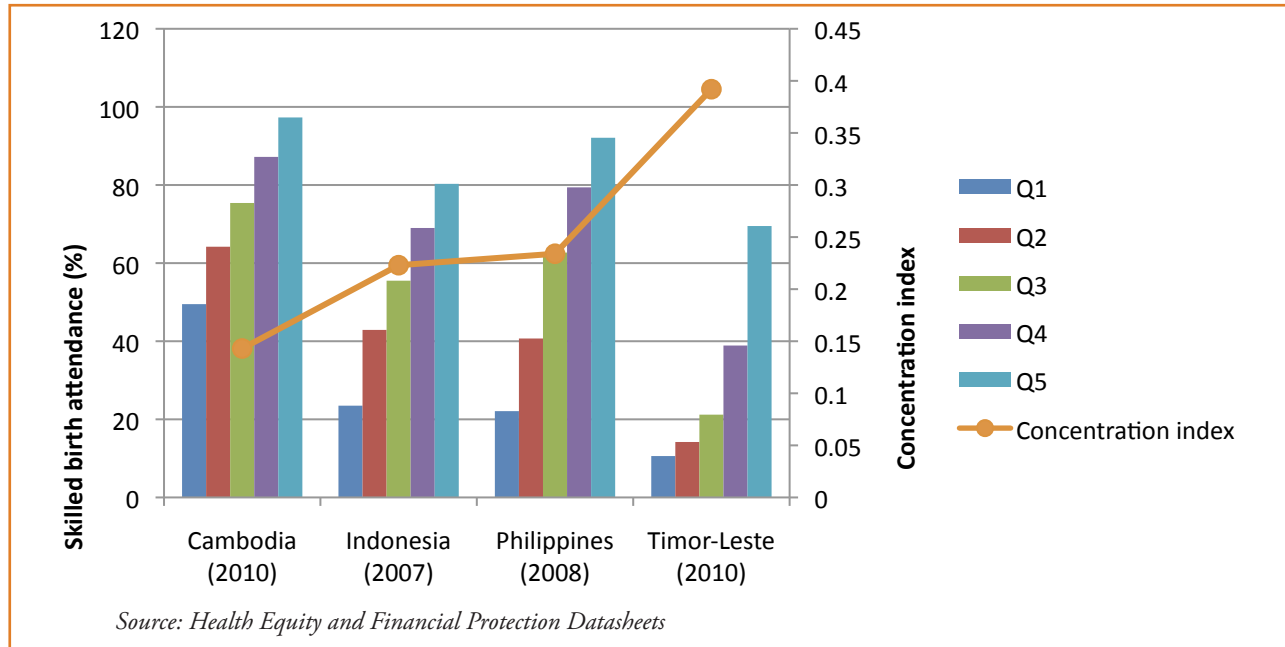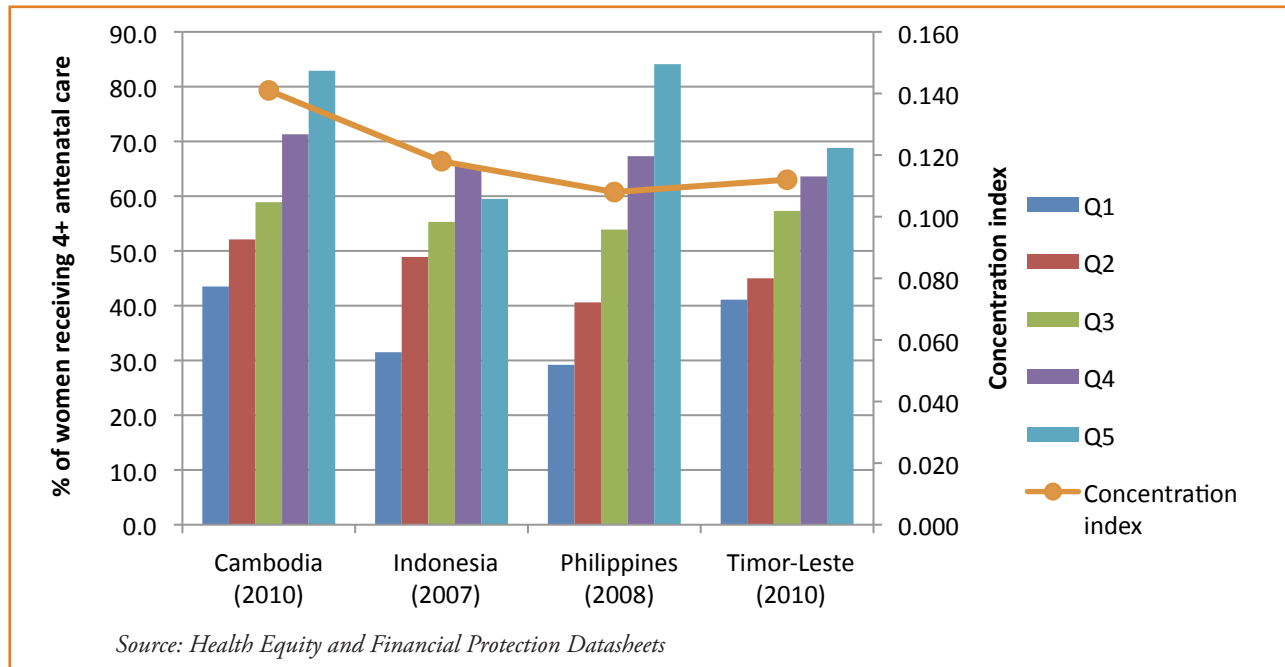**Figure 7.3. Comparison with other countries on skilled antenatal care (4+ visits)**

Source: Health Equity and Financial Protection Datasheets

Figure 7.4. Comparison with other countries on percent of birth attended by skilled health workers

Source: Health Equity and Financial Protection Datasheets

In summary, compared with other countries, the distribution of infant mortality and under-5 mortality rates seems more equitable in Timor. However, this is largely driven by the fact that even the better-off households suffer from a relatively high infant and under-5 mortality rate. This relates to the low living standard in general and weakness in the overall health delivery system in Timor. Though the antenatal visits seem more equitably distributed across the quintiles in Timor than other countries, skilled birth attendance is significantly pro-rich. However, even with the much-improved access of skilled birth attendance by the richest quintile, the health outcomes (infant and under-5 mortality) of those are still quite low compared with the other three countries, implying quality of the service remains as an issue.

8.1. Summary

Timor-Leste has achieved relatively high levels of financial protection for its citizens, but there remain some concerns. While the government finances a large share of total health expenditure (72%) compared to other East Asian countries, Timor-Leste still relies heavily on external financing, an unstable source of financing that flows through public and private channels. It accounts for almost half of total health expenditure. Publicly provided health care is free at the point of service, making out-of-pocket spending a small share of total health expenditure.

Government spending accounts for a large share (72%) of the total health expenditure, which is relatively high compared with other East Asia countries at similar or higher GDP levels. However, in terms of absolute value of government spending on health or public health expenditure as a share of government expenditure, Timor is among the lowest of the comparator countries. Public spending has been steadily decreasing from 12 percent of the GDP in 2005, down to an estimated four percent in 2012. Also, the share of goods and services has been decreasing in recent years from about 59 percent of the health budget in 2008 to 30 percent in 2012. This could potentially exacerbate health outcomes for the poor and the country's ability to limit catastrophic health spending.

The poor tend to have worse child health outcomes, compared to wealthier households. Infants and children under five from the households in the poorest quintile are 1.4 times more likely to be underweight and 1.7 times more likely to die than those from households in the wealthiest quintile. Wealthier households are more likely to report child illnesses such as diarrhea and fever. This may be due to the ability, among the wealthy, to more easily recognize the symptoms of diseases, even though they may actually have a lower incidence of these illnesses. Coverage of key maternal and child health interventions including treatment of childhood illness is usually higher among the better-off. Children from the wealthiest households, for example, are twice more likely to use bednets than those from the poorest households. Women in the wealthiest households are 6.5 times more likely to deliver with a skilled attendant than women in the poorest households.

The poor tend to utilize lower level health care services such as community health centers and mobile clinics more frequently than the wealthy. The wealthy use hospitals more frequently which are more costly than lower level health care services. If one assumes that higher fees also reflect higher subsidies, one would conclude that government spending is, in fact, very much pro-rich.

Health care spending is a small share of household expenditures and has little effect on driving households into poverty. With out-of-pocket spending accounting for a small share of total health expenditures, household health spending is not a major driver of poverty. In 2011, less than ten percent of households spent ten percent of non-food consumption on health, compared to 23 percent in 2001/02. Also, less than one percent of households face the additional risk of impoverishment due to health expenses throughout the same period.

Timor-Leste has a high degree of inequality, but health care financing in Timor-Leste is progressive. The Gini coefficient was 0.292 in 2011/12, comparable to 0.297 in 2007/08, and an improvement from 0.403 in 2001/02. This indicates that the wealthy consume a large share of all the goods and services (39 percent). The wealthy, however, also cover 74 percent of total health care payment, and thus health care financing is progressive. While taxes and OOPs constitute a small fraction of the total revenues to the health sector, it is still important to note that taxes and OOPs in Timor-Leste are progressive relative to consumption.

Compared with Indonesia, Philippines, and Cambodia, the distribution of infant mortality and under-5 mortality rate seems more equitable in Timor. However, this is largely driven by the fact that even the better-off households suffer from a relatively high infant and under-5 mortality. Though the antenatal visits seem more equitably distributed across the quintiles in Timor, the inequality in skilled birth attendance indicates this service is significantly pro-rich. However, even with the much improved access of skilled birth attendance by the richest quintile, the health outcomes are still quite low compared with the other three countries, implying quality of the service remains as an issue.

8.2. Policy Implications

1. **Continue improving the availability and quality of services at the frontline.** As established, the poor access community health centers and mobile clinics more often, while the wealthy tend to seek care from hospitals. The availability and quality of services offered at the community health centers, health posts, and SISCA sites needs to be strengthened so patients, particularly the poor, can access quality primary care. A large number of Cuban trained Timorese doctors have recently returned and present a unique opportunity to significantly strengthen the primary health care system, especially in rural areas. The increase in the number of qualified health workers should be accompanied by better management of human resources and creating conducive environments for health care workers. The instruments include but are not limited to: incentivizing good performance to reduce inefficiency such as total absenteeism and reduced working hours; improving procurement and timely distribution of essential commodities (e.g., medicines and medical supplies); ensuring basic infrastructure (e.g., water and electricity); and taking measures to improve quality of services (e.g., step-wise quality accreditation system). Engaging community and empowering citizens to effectively monitor service delivery will also be imperative to ensure effective utilization of the services by citizens, particularly the poor.

2. **Improve accessibility of secondary care to the poor when needed.** The utilization of secondary care, which is largely publicly-subsidized, is pro-rich. In order for the poor to have better access to secondary care services, the up and down referral system between primary and secondary care levels needs to be strengthened. The major barriers for the poor to access secondary care might not be point of service user fees, but rather physical access to district and national hospitals. The government needs to explore options which can improve the poor's access to secondary care when clinically required by providing, for example, travel vouchers, or (partial) reimbursement of travel costs. Anecdotal evidence has shown that oversea referrals are pro-rich benefitting those who are economically and socially better off. Increased transparency on the oversea referral program is required to ensure the equitable allocation and utilization of resources.

3. **Monitor the impact of tightening fiscal space on public health spending on poor.** In an environment where fiscal space is tightening, the poor are usually more affected. The utilization of some essential health services that often incur out-of-pocket expenditure such as skilled delivery is much lower among the poor. This highlights the need for the government to closely monitor the impact of the tightening fiscal space on service utilization especially among the poor, as well as the catastrophic out-of-pocket expenditures. The household surveys conducted by the MoH (e.g., DHS) and the MoF (e.g., TLSLS) provide information to do so.

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10. ANNEXES

10.1 Measurement of indicators

Indicator	Measurement	Data
Child Health		
Infant mortality rate	Number of deaths among children under 12 months of age per 1,000 live births	DHS
Under-five mortality rate	Number of deaths among children under 5 years of age per 1,000 live births	DHS
Stunting	% of children with a height-for-age z-score <-2 standard deviations from the reference median (Note: z-score calculated using WHO 2006 Child Growth Standards)	DHS
Underweight	% of children with a weight-for-age z-score <-2 standard deviations from the reference median (Note: z-score calculated using WHO 2006 Child Growth Standards)	DHS
Diarrhea	% of children with diarrhea (past two weeks)	DHS
Acute respiratory infection	% of children with an episode of coughing and rapid breathing (past two weeks)	DHS
Fever	% of children with fever (past two weeks)	DHS
Adult Health		
Obesity among non-pregnant women	% of women aged 15 to 49 with a BMI above 30	DHS
Anemia	% of women aged 15 to 49 anemic based on hemoglobin testing	DHS
Risk Factors		
Smoking (all)	% of adults who smoke any tobacco products such as cigarettes, cigars or pipes	DHS
Smoking (women)	% of women aged 15 to 49 who smoke cigarettes, pipe or other tobacco	DHS
Smoking (men)	% of women aged 18 to 49 who smoke cigarettes, pipe or other tobacco	DHS
Mosquito net use by children	% of children who slept under an (ever) insecticide treated bed net (ITN) (past night)	DHS
Mosquito net use by pregnant women	% of pregnant women aged 15 to 49 who slept under an (ever) insecticide treated bed net (ITN) (past night)	DHS
Maternal and Child Health Interventions		
Full immunization	% of children aged 12-23 months who received BCG, measles, and three doses of polio and DPT, either verified by card or by recall of respondent	DHS, MICS
Treatment of diarrhea	% of children with diarrhea given oral rehydration salts (ORS) or home-made solution	DHS, MICS
Medical treatment of ARI	% of children with a cough and rapid breathing who sought medical treatment for acute respiratory infection (past 2 weeks)	DHS, MICS
Skilled antenatal care (4+ visits)	% of mothers aged 15 to 49 who received at least 4 antenatal care visits from any skilled personnel (doctor, nurse/midwife, auxiliary midwife, family nurse, trained birth attendant)	DHS
Skilled birth attendance	% of mothers aged 15 to 49 that were attended by any skilled personnel at child's birth	DHS
Contraceptive prevalence	% of women aged 15 to 49 who currently use a modern method of contraception	DHS, MICS

10.2. Methodological notes

Sections 2 and 3: Inequalities in health and health care utilization

The selection and measurement of health outcome indicators used in Section 2 and 3 on inequalities in health and health care utilization was based on (i) a comparison of indicators used in major health publications and databases, (ii) the advice of World Bank Health Specialists on recommended monitoring and measurement practice in their respective fields, and (iii) how measurable those indicators would be in the available data sources. The following major reports/databases were consulted as a guide to indicator measurement: World Bank Development Indicators, the World Bank's HNPStats database, WHO's World Health Survey country reports, and the World Bank's report series on "Socio-economic differences in health, nutrition and population (Gwatkin et al. 2007).

The data sources for this section include the Demographic and Health Surveys (DHS) and multipurpose household surveys (such as the World Bank Living Standard and Measurement Surveys). Where the selected indicators are available in more than one of these surveys, all measures are reported.

In all analyses of inequality in this section, i.e. quintile analysis and calculation of concentration indices, households are ranked by an asset index computed using principal components analysis. In order to avoid presenting estimates biased by insufficient power, indicators were removed from the tables if the sample size in any quintile was less than the following thresholds: 250 per quintile for infant and child mortality estimates and 25 per quintile for all other indicators. This follows the practice of Gwatkin et al. (2007). In addition, the statistical significance of all concentration indices is reported.

Differences between the child mortality statistics in this report and in the DHS are due to the use of a "true cohort life table approach" which gives the true probabilities of deaths. This means that we define infant mortality as the number of deaths among children under 12 months of age per 1,000 live births, using a sample of children born between 10 and 1 years before the survey, by dropping the children born in the year before the survey (i.e. children who have not had the chance to complete one year). Similarly, we define under-five mortality as the number of deaths among children under 60 months of age per 1,000 live births, using a sample of children born between 10 and 5 years before the survey, by dropping the children born in the 60 months preceding the survey from the sample (i.e. children who have not had the chance to complete five years). By contrast, DHS adopts a "synthetic cohort life table approach". This approach involves creating a number of age segments and calculating the probability of dying for each segment. The denominators are the number of children in the cohort who turned exactly 0, 1, 3, 6, 12, 24, 36, 48 months in the period 0-10 years before the survey and have completed the respective age segments in the period of 0-10 years before the survey. The numerator of each one is the number of deaths for each group of children in the respective age range (e.g. 0-0.99 months, 1-2.99 months, 3-5.99 months, etc). Once the probability of each has been calculated, they are combined to calculate the IMR and U5MR using the lifetable function of "q"(=probability of dying). Yet another alternative is a "vital statistics approach" where the denominator is births 0-10 years before the survey and the numerator is all the under- 5 deaths in the period 0-10 years before the survey. This means not only the deaths of the children who were born in 0-10 years before the survey, but also the children who were born in 10-15 years before the survey (but died under the age of 5 in the period of 0-10 years before the survey). The DHS approach is probably technically superior because the information for the denominator and numerator come from exactly the same children, and is not affected by a rapid change in the number of births (as the vital statistics approach is) nor does it require dropping information on children born in recent years (as the true cohort life table approach does). It is, however, more computationally-intensive and, as such, a less pragmatic one for our purposes. The approach used in the Socioeconomic Differences reports is also a "true cohort life table approach", except that in the case of under-five mortality these reports also only drop children born in the last year (rather than the last five years) from the sample.

Section 4: Benefit-incidence analysis

The section on benefit incidence analysis uses three different methods for allocating government health expenditure to households, invoking three different assumptions that are described in detail in Wagstaff (2011). The first, the constant unit cost assumption, treats the sum of individual fees and government subsidies as constant, and thus any fees paid when using public services results in a reduction in the government subsidy received. The second, the constant unit subsidy assumption, allocates the same subsidy to each unit of service used, irrespective of the fees paid. Finally, the third, the proportional unit cost assumption, makes the cost of care proportional to the fees paid, which implies that the government subsidy received increases as the fees paid increases. In calculating the distribution of fees, service utilization and government subsidies, households are ranked by per capita consumption. The quintile data sources for this section include multipurpose household surveys that are used to obtain information on service utilization at difference levels of care and fees paid by patients. Data on government subsidies at each level of service are obtained from government reports on budgets and health expenditures.

Section 5: Financial protection

This section examines catastrophic health care payments and impoverishment due to OOPs. In this section, households are ranked by consumption. The analysis of catastrophic health care payments follows the popular approach elaborated upon O'Donnell et al. (2008) which defines health spending as "catastrophic" if it exceeds some fraction or threshold of total expenditure, or of total nonfood expenditure, in a given period. As O'Donnell et al. (2008) note, the threshold of 10% for total expenditure and 40% for nonfood expenditure are commonly used in the literature. In addition to measures of incidence, distribution-sensitive measures of catastrophic payments are calculated, specifically the concentration index, and statistical significance is reported. The analysis of impoverishing expenditure uses the national poverty lines.

Section 6: Progressivity of health care finance

This section examines the progressivity of different sources of healthcare financing/payments, including OOPs, health insurance contributions, direct taxation and indirect taxation. The Kakwani index, defined as the concentration index minus the Gini coefficient, indicates whether payments are more/less concentrated among the better off than consumption is and, thus, is a sign of whether payments are progressive/regressive. The main data source needed for the analysis of progressivity of health care financing is a multipurpose household survey, preferably with a very detailed consumption module.