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SCHOOL OF PUBLIC HEALTH
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India Health Systems Project Health System Assessment Guides

Report 24

A Guide to Assessing Financial Risk Protection

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December 2020

1. Overview of the concept of financial risk protection

1.1. Why is financial risk protection important and how is it defined?

Financial risk protection is a key health system outcome. Health systems only perform well if they protect people from the financial risks of health care costs. Financial risk protection is key to safeguarding gains in human development and ensuring people get the care they need to avert health loss.

1.2. How is financial risk protection defined?

Financial risk protection is defined by the World Health Organization as "achieved when direct payments made to obtain health services do not expose people to financial hardship and do not threaten living standards." Financial risk protection in health is focused on out-of-pocket (OOP) payments, or direct payments made to health care providers at the time goods or services are received. OOP spending is conceptualized as largely involuntary and unwanted, as it does not contribute to household well-being like spending on other goods and services, particularly necessities such as food and shelter. OOP health spending can divert funds away from critical subsistence needs, such as housing, food, clothing and education, threatening living standards. If cash is not on hand, OOP costs may force households to sell assets or borrow at high interest rates, weakening households' ability to withstand future financial shocks and reducing the productivity and income generated by agriculture or other household enterprises (1). In these ways, OOP payments can push households into poverty and further impoverish households already living below the poverty line (2, 3).

2. Measurement and analysis of financial risk protection

2.1. How is financial risk protection measured?

The most common measure of financial risk protection is catastrophic health expenditure (CHE), or when OOP health spending exceeds a pre-defined share of household income or household consumption spending. Another common measure is impoverishing health expenditure (IHE), which measures whether, once health spending is subtracted, consumption expenditure falls below the poverty line. Below we discuss the

different components of these common measures of financial risk protection, their attributes, and measurements challenges (4, 5). We also discuss alternative measures that could be considered depending on the data available.

2.2. What are the common financial risk protection indicators?

Catastrophic health expenditure (CHE)

There are two common approaches to measuring CHE. First, as shown in Measure 1, health spending is considered catastrophic if it exceeds 10 percent (or alternatively 25 percent) of consumption expenditure or income.

Measure 1

$$\text{CHE} = 1 \quad \text{if}$$

$$\frac{\text{Health spending}}{\text{Household consumption expenditure or income}} > .1 \text{ or } .25$$

$$\text{CHE rate} = \frac{\sum_{i=1}^{N} \text{CHE}}{N}$$

Where health spending is the sum of a household's health care consultation fees, diagnostics costs, laboratory fees, medicines costs, and other "direct" spending. Indirect spending – spending not directly associated with health care such as transportation costs or informal payments to health care workers – are typically excluded. Total household spending is the sum of all spending on consumption (household spending omitting investments and savings) by the household, inclusive of health spending.

In developing countries, consumption expenditure is generally preferred to income. Household spending, rather than the income received, represents the material well-being derived from the consumption of goods and services. Furthermore, in developing countries where home production, agriculture or other seasonal income generation processes are common, income can fluctuate substantially over the course of

the year and thus can be over- or under-estimated with household budget surveys (6). Consumption expenditure is more likely to be smoothed over time, taking into account households' expectations for the future (or their "permanent" income under Friedman's (1957) effective lifetime income hypothesis). In developing countries where the informal sector is relatively large, some respondents may also not want to reveal their true income.

The other common measure of CHE (Measure 2) substitutes "capacity to pay" for consumption expenditure or income. Capacity to pay is conceptualized as the spending remaining once basic subsistence needs are met – the principle is that households should finance health with the remaining funds, not with funds intended for basic subsistence. Frequently, basic subsistence needs are estimated based on food spending or, alternatively, the mean of the 45-55th percentiles of food expenditures, adjusted for household size, which is used because, particularly as household income grows, some portion of food spending is discretionary (7). The food subsistence expenditure measures have the benefit of being calculated directly from the survey data.

Measure 2

$$\text{CHE} = 1 \quad \text{if}$$

$$\frac{\text{Health spending}}{\text{Consumption expenditure or income} \; - \text{Capacity to pay}} > .4$$

$$\text{Capacity to pay} = \text{mean}(45\text{th to } 55\text{th percentile of food spending, adjusted for hh size})$$

These CHE measures have a number of weaknesses. First, there are tradeoffs between measures (1) and (2) of CHE. Wagstaff and Hoang-Vu Eozenou (2014) argue against Measure 2 because creating a subsistence measure based on food spending is less relevant for high-income country contexts where very few households will face that low level of subsistence (8). Furthermore, some households' consumption spending will fall below the food spending threshold and, for these households, observed food spending is replaced as the threshold. This makes the CHE metrics less comparable for those households living above and below the food spending threshold; households just below

the threshold would have more capacity-to-pay in this approach. However, the 40 percent capacity-to-pay in Measure 2 is slightly more commonly used in the literature, and more sensitive to spending among the poor than Measure 1, because the threshold tends to result in less capacity to pay for low-income households, and thus OOP health spending is more likely to be above the 40 percent threshold for these households (9).

Impoverishing health expenditure (IHE)

Another critique of the CHE measures is that the 10 percent, 25 percent and 40 percent thresholds are arbitrary – there is no conceptual reason why these thresholds should be used. A wealthy household that spends 25 percent of its income on health could be far from impoverishment, whereas a low-income household spending 5 percent of income on health could fall below subsistence levels. An alternative to these thresholds is to use the impoverishing health expenditure (IHE) metric (Measure 3), which compares health spending and consumption spending or income to the poverty line (10).

IHE is incurred by a household when total consumption expenditure or income exceeds the poverty line but, once OOP spending is subtracted, consumption expenditure or income below the poverty line, as shown in Measure 3 (2).

Measure 3

$$\text{IHE} = 1 \quad \text{if}$$

$$\text{Consumption expenditure or income} > \text{Poverty line}$$

$$\& \quad \text{Consumption expenditure or income} - \text{Health spending} < \text{Poverty line}$$

$$\text{Poverty head count ratio} = \frac{\sum_{i=1}^{N} \text{IHE}}{N}$$

The poverty head count ratio summarizes IHE, capturing the proportion of the population pushed over the poverty line by OOP spending or the change in the poverty

head count attributable to OOP spending. This is typically expressed as the share of the population impoverished by medical spending.

Finally, the poverty gap (Measure 4) captures how far OOP spending pushes household consumption expenditure or income below the poverty line. An attribute of the poverty gap is that it captures households already living below the poverty line as well as those that experienced IHE. The gap is averaged across all households to represent the change in the poverty gap resulting from OOP spending.

Measure 4

$$\text{Poverty gap} =$$

$$\text{Poverty line} - (\text{Consumption expenditure or income} - \text{Health spending}),$$

$$\text{Poverty gap} = \frac{\sum_{i=1}^{N} \text{Poverty gap, if Poverty gap} > 0}{N}$$

In recent analyses of IHE, three poverty lines were considered: $1.90 per day (or the extreme poverty line), $3.10 per day, both computed using 2011 purchasing power parity international dollars, and the relative poverty line, which is defined as 50 percent of median consumption in each country (2). While the $1.90 and $3.10 measures allow for comparability across countries, one drawback of this approach is the need to convert international poverty lines into local currency units and control for inflation and purchasing power parity. Converters are available from the World Bank but vary over time and sometimes need careful consideration of where the household surveys are conducted within a country. National purchasing power parity may not reflect variation at the local level – goods and services may be cheaper in rural versus urban areas, for instance, and thus a given amount of money could go farther. Different results can also arise from the order of operations: converting first and then inflating, or inflating first and then converting (11). Therefore, the 50 percent median consumption threshold or local poverty

lines may be preferable for health system performance assessments focused on one country context only.

Comparing the different measures of FRP

Table 1 describes the pros and cons of the four main measures of FRP discussed. Depending on the audience, data and purpose of measuring FRP, analysts may find different measures suitable.

Table 1: Pros and cons of the most common measures of FRP

	Pros	Cons
Measure 1: Catastrophic health expenditure (CHE) using income or consumption expenditure	• Easiest to compute • Requires only two variables commonly collected • Often used: policymakers familiar with • The target used for SDG 3.8.2	• More sensitive to high health spending among the wealthy than the poor
Measure 2: CHE using capacity-to-pay	• More sensitive to high health spending among the poor than the wealthy • Often used: policymakers familiar with • May be more conceptually appealing (health spending considered once subsistence needs have been met)	• Depends on constructing a "capacity-to-pay" threshold to capture some measure of subsistence expenditure • Adjusting for household size requires making assumptions about the shape of the demand curve for food consumption as the number of household members increases • The threshold is typically based on food spending, which is not a good measure of subsistence needs in high-income country settings

		• Must use observed food spending when total consumption expenditure falls below the threshold, which can result in a different CHE status for households with the same amount of health spending but just above and below the capacity-to-pay threshold
Measure 3: Impoverishing health expenditure (IHE)	• Conceptually appealing and intuitive because of the comparison with standardized, international poverty lines • May be more suitable for non-health audiences	• Less commonly used than CHE • Requires construction of the poverty line in local currency, which requires adjusting spending for purchasing power and inflation in some cases; analysts may want to consider baskets of good at the subnational level to be accurate
Measure 4: Poverty Gap	• Appealing because it captures the depth or distance from the poverty line, not just whether consumption expenditure fell below	• Less commonly used than CHE • May be difficult to explain to some audiences • Similar challenges as IHE in terms of construction

Alternatives based on cross-sectional spending data

Alternatives to the CHE and IHE metrics have been proposed by researchers in an effort to overcome identified shortcomings in these measures. None of these have yet been standardized and widely used, but we introduce them and discuss what CHE or IHE drawback they are trying to address, as well as their attributes and shortcomings here.

Inequality-adjusted FRP. Large OOP that happens among the rich count the same as large OOP among the poor in Measures 1, 2 and 3 above. Equity-minded policy-makers may be more concerned about the impact of OOP spending among the poor however. Weighting CHE or IHE by the achievement index has been proposed as one way to inequality-adjust financial risk protection measures (12). The achievement index assigns a weight of two to the poorest person and linearly falls until the richest person is assigned a weight of zero. The result is equal to the mean multiplied by the complement of the concentration index. If CHE or IHE is more concentrated among the poor, the inequality-adjusted measure will be higher than the non-adjusted measure. The Watts index or the Gini coefficient have also been proposed for similar purposes (13).

Need-adjusted FRP. A major limitation of CHE and IHE is that they focus on financial protection among those who sought and received care. They fail to account for how OOP spending could deter people from receiving care. People for whom care is foregone due to cost would be counted among those that did not incur CHE or IHE. In this way, large amounts of foregone care due to costs may look like good performance on FRP. It is for this reason that assessments of financial risk protection should be accompanied by analyses of access, including service coverage. In terms of improving CHE or IHE, measures of need-adjusted OOP have been proposed in which researchers estimate the medical care individuals would have received had they been treated, on average, as other individuals with similar "health need" characteristics (i.e., observable factors such as age and gender) (14). However, methodological challenges in this area have not yet been resolved; difficulties in determining what kind of health care people need, particularly for complex inpatient and outpatient care, have not yet been addressed in the existing literature (15).

Coping-adjusted FRP. Proposed by Flores et al. 2008, this measure of CHE considers how OOP spending is financed (16). If OOP spending is financed from savings, the selling of assets or borrowing, the short-term consequences for consumption expenditure may be minimal; no consumption may need to be sacrificed to cover OOP health care costs. OOP-driven poverty could be "hidden" because total household

expenditure is inflated by financial coping strategies such as borrowing or selling assets. Without considering coping strategies, standard CHE measures could overstate the risk to current consumption and inflate the scale of catastrophic payments. For these reasons, the authors propose a coping-adjusted CHE metric, which is calculated based only on whether OOP spending was financed by current income, rather than the coping financing sources of savings, borrowing and selling assets.

Volatility-adjusted FRP. Another critique of the two main FRP measures is that they do not incorporate expectations for OOP health spending. Particularly in a model of reference-dependent utility with loss aversion, the volatility of OOP may be important part of welfare loss. That is, if households have some expectation for OOP health spending, they may be able to prepare financially for those costs. As more uncertainty surrounds that expectation, households are less able to prepare, particularly for large health spending shocks, and may be more likely to have to sacrifice consumption to cover OOP health care cost. Flores and O'Donnell (2016) propose a method for decomposing exposure to large OOP health spending into the probability that OOP spending exceeds a threshold, the loss due to predictably low consumption of other goods given that spending exceeds the threshold, and the loss due to the volatility of medical expenses above the threshold (17). While the authors provide a test case for this metric, it has not yet been widely adopted or tested by others.

Unified approach to FRP. It is not obvious whether CHE or IHE is the appropriate metric for a given analysis of financial risk protection. Assessing trends over time of the different measures may also lead to different conclusions if they move in opposite directions (5). Wagstaff & Hoang-Vu Eozenou (2014) thus propose a unified approach that maps households that spend OOP spending into mutually exclusive groups based on the metrics in Measures 1 to 4 above (8). OOP payments are expressed as the ratio of "discretionary" consumption, or the amount that consumption spending, net of OOP spending, exceeds the poverty line. Households are categorized into: (i) no OOP spending, (ii) non-catastrophic health spending, (iii) catastrophic health spending, (iv) impoverishing expenditure, and (v) immiserizing expenditure (when households living below the poverty line are pushed further into poverty). The authors propose weights for

each category. Alternatives to this approach would be to use a dashboard approach presenting all common indicators side by side (5).

2.3 What are the data needed to measure financial risk protection?

CHE and IHE measures are commonly used because of the availability of household budget surveys, which are completed regularly in low- and middle-income countries to estimate poverty, gross domestic product and price indices. Typically conducted to be representative of the population of interest, these surveys involve face-to-face interviews in which households report on spending. Respondents either report how much they spent on different categories of goods and services in the past for a given period (the recall approach), or they are asked to keep a diary prospectively over a certain period of time in which they record all expenses (the diary approach).

The recall approach is more common. It tends to be less expensive because these surveys are typically completed with one interview. However, the dependence on one visit from an interviewer means that, although ideally health spending and household spending and income would be captured for a full year, different recall periods are used for different types of spending. Optimal recall period depends on the spending category because of differences in purchase frequency. For instance, longer recall periods tend to depress health spending, particularly among low-income groups, because feeling ill is a more common occurrence (18). The last thirty days is most often used for spending on health (excluding inpatient care), food, rent and other more frequent spending categories although more recent evidence suggests that 15-day recall period for health spending improves accuracy. A twelve-month recall period is typically used for spending on hospitalizations, education, investments and other large but less frequent spending areas. In some surveys, a seven-day recall period is used for food spending.

The most rigorous budget household budget surveys will disaggregate spending into small, specific categories to ensure households remember even minor expenses because asking one-shot or summary questions and fewer questions overall tends to underestimate spending (19). For instance, different, mutually-exclusive components of

health spending are often captured: consultation fees, diagnostics costs, medicine costs, the costs of traditional healers, and other medical costs. These expenditures should be summed and any reimbursements removed from the total. Transportation to and from encounters with health providers is sometimes captured separately but for the purposes of assessing financial risk protection this type of "indirect" health spending is not often included in the OOP payment total, in part because many household budget surveys do not ask about this category of spending (20). Analysts may want to consider indirect spending in a complementary analysis, however, to assess whether this type of spending is significant relative to OOP, food and total household spending. Another critical component of household budget surveys is capturing consumption that is home-produced, such as food. Omissions of home-produced goods can lead to underestimating the spending of agricultural households in particular and inflate CHE.

Diaries are an alternative to household budget surveys sometimes used and that overcome concerns related to forgetting (which increases with the recall period) and telescoping (when big spending events are put in the wrong recall period). With diaries, households are asked prospectively to record spending in a template furnished by researchers for a certain time frame. After one or two weeks elapse, researchers return to collect the spending recorded by households in the diary template. Compared to budget surveys, diaries can be more expensive, particularly because to get an accurate picture of annual spending, researchers must return many times (e.g. twice a month for six months). Furthermore, while the prospective nature of diaries can boost accuracy initially, there is evidence that diary fatigue can set in, leading household participants to fail to fully account for all spending in the diaries or to wait to record responses just before the diary is due (which entails depending on recall) (21).

2.4 Alternative approaches to measuring financial risk protection

OOP costs without total household income or spending

A common situation is that data capture only the OOP costs of a health care encounter or episode of illness without collecting information on a patient's household income or consumption expenditure. This is often the case with insurance claims data, population health surveys, and patient exit interviews. Without a measure of a

household's financial status, it is not possible to fully examine financial risk protection – patients may be spending more because they have more resources.

However, these types of data can be used to compare health spending across groups and across time, shedding light on important inequities and the evolution of health spending as the economy and health system change. Although it is important to consider how access to health services and the type of services pursued play a role when comparing groups, average OOP spending could be compared by disease or condition, wealth quintile, poverty status, rural/urban residence, insurance enrollment, or ethnicity. OOP spending can be broken down by what types of health spending are most common. Examining whether OOP is focused mostly on drugs, consultation fees, or diagnostics, for instance, can highlight which spending areas are most likely to threaten financial risk protection. Assessing OOP before and after a health system reform, particularly if combined with rigorous quasi-experimental methods, can shed light on the impact of policies and programs.

Another common analysis is to compare OOP spending to total health spending. The OOP share of total health expenditure is often used for cross-country comparisons where the more financed OOP, the worse financial protection is presumed to be. These types of data often are produced through National Health Accounts, financial accounting exercises published in reports, many of which have been aggregated by the World Health Organization (22).

Repeated measures of health and consumption spending

CHE and IHE focus on a single snapshot of household spending at the time of the health spending shock. Because of the short time frame captured, these measures cannot shed light on the long-term consequences of health spending for living standards. Selling assets or borrowing, potentially at high interest rates, may affect living standards over the long-term. Depleting productive asset could affect future earnings and lead to poverty. Alternatively, OOP-driven poverty could be "transient" – necessary consumption is temporarily sacrificed to pay for health care without any long-term effects (16).

Following households over time with the use of panel data is a key approach for understanding how living standards withstand major health spending shocks. Consumption spending, income and assets can be assessed before, during and after the health spending shock with these data (23). The persistence/frequency of health spending versus the incidence of single large even can also be assessed to determine the types of health spending most affecting households. For instance, Kinnan et al. (2019) use a dataset that captures monthly reports of household finances in Thailand for nearly 20 years (1). The authors compare households that incurred a health spending shock to similar households and track consumption expenditure, the productivity of household enterprises, as well as the financial standing of other households linked up in the supply chain. Other examples of this kind of longitudinal data include Indonesian Resource Mobilization Study (IRMS), and the Health and Retirement Surveys and the Panel Study of Income Dynamics (PSID) in the United States. These type of data are rare and difficult and expensive to collect. Furthermore, assessments of the long-term financial hardship and living standards requires sophisticated data analysis that may be beyond the scope of teams tasked with broad assessments of health system performance.

Distress financing

In some cases, robust household budget surveys are not available. One alternative is to use "distress financing", which is focused on whether patients sell assets or borrow funds to cover health care costs. A single question of this type will sometimes be included in population health surveys, often focused on a specific health care encounter or health event, such as pregnancy and delivery. For instance, in the National Family Health Survey (NFHS 4) in India, female respondents were asked whether they experienced distress financing at their last birth (36).

The distress financing measure captures extreme cases of financial distress due to health care costs. However, it fails to capture when a household must sacrifice spending on food, lodging, or other necessities due to health care costs. It also only captures financial distress among households that have assets to sell or that have access to some form of credit. It thus falls short in key ways and should be seen as complementary or a

backup to CHE and impoverishing expenditure estimates, considered only in the absence of a household budget survey.

Foregone care due to costs

Another way to assess financial risk protection is to assess answers to a question also sometimes found in health surveys: "In the last 12 months, have you put off health care due to costs?" In this case, "yes" means that the respondent had foregone care due to costs or that they report that the OOP costs of health care deterred the respondent from accessing needed health care. Again, this should be considered as a complementary or backup measure. This question is subject to recall bias and may be interpreted differently among different populations. However, these types of questions are available in a number of existing surveys such as the Commonwealth Fund International Health Policy Surveys (25), World Health Organization (WHO) World Health Surveys (26), WHO's Study on Aging and Adult Health Surveys (27), and the World Bank's Living Standards Management Study (28).

2.5 How are financial risk protection indicators analyzed?

The main things to consider for financial risk protection are the availability of health services requirement payment, low capacity to pay and lack of prepayment/health insurance.

Assessing financial risk protection with the measures discussed can shed light on how well the population is able to financially withstand major health spending shocks. Common analyses are to examine these different measures across sub-groups to understand if low financial risk protection is concentrated in some groups more than others, this includes computing measures separately by wealth index, rural/urban residence, ethnicity, disease type, insurance status, private versus public sector health care, and other groupings that may be relevant to the health system. Breaking down OOP by what spending is allocated to (drugs, consultation fees, diagnostics, etc.) is also common. The different financial risk protection measures can also be important outcomes in assessing the impact of programs if combined with quasi-experimental or experimental research designs.

One common shortfall in the measures assessed is that OOP can also be a deterrent to access to health services. With the exception of the foregone care due to costs measures, all the financial risk protection metrics discussed could make the health system look like it is performing well, when in fact, high OOP costs are deterring sick people from using health care. Thus, these measures need to be considered in the context of the overall need, including the prevalence and incidence of different health outcomes. If, for instance, heart disease prevalence is high but few people report spending OOP and heart disease care, and few CHE cases due to heart disease exist, this could be because people with heart disease cannot afford the OOP cost of care and thus are going without needed health services. For this reason, financial risk protection cannot be considered without also examining access, health outcomes and the other measures of health system performance we discuss in this report.

Cross-country analyses have shed light on factors beyond the health system that may explain changes in financial risk protection over time. CHE rates tend to rise with income, which is posited to reflect better service availability, use of expensive technology, and higher prices, rise with poverty, whereas declines in CHE are associated with increases in publicly-pooled financing, declines in OOP as a share of total health expenditure, emphasizing the important role of public financial arrangements in ensuring financial risk protection (21). Inequality has also been associated with CHE. No relationship between CHE and the age profile of the population has been detected.

Questions sometimes asked in financial risk protection analyses:

- What do individuals/households spend on in terms of health? Predominately drugs, insurance premiums, consultations, transportation?
- How much do individuals/households spend on private versus public providers? If they are or are not insured?
- What is the relationship between risk pooling/prepayment mechanisms, including insurance, and FRP? Do these risk pooling/prepayment mechanisms truly provide protection from risk? To what extent?

- Which disease areas most drive OOP and catastrophic and impoverishing expenditures?
- Are there interdependencies between FRP and health financing more generally, i.e. do providers/health facilities gain a significant portion of their revenues from OOP? Are they dependent on OOP as a key revenue source?

3 Policy action to improve financial risk protection

An array of policies target financial risk protection. This section will cover some of the most commonly used. First, health insurance is a widespread approach to ensuring households are financially protected from the risk of large health care costs. Health insurance design is an extensively studied topic, with key decisions involving: who will pool funds (governments, social funds, private entities, or communities); whether contributions will be mandatory or voluntary; the level of contributions or premiums and how they differ across individuals; which procedures, diagnostics, drugs and other care will be covered; and what share of costs will be paid by the insurance plan. The impact of health insurance on CHE is integrally tied to these design choices.

Another common approach to improving financial risk protection is to provide services for free in the public sector. In this case, governments use taxes and other revenues to cover costs that would otherwise by funded by OOP (29). However, there is some risk that eliminating user fees can have an impact on the quality of services and availability of supplies. For example, health facilities sometimes rely on user fees to finance improvements to infrastructure or minor purchases of supplies that ensure that quality is maintained.

Other approaches to reducing OOP costs may be reducing prices themselves, including through advanced market commitments, ensuring that the priced passed on to patients are decreased. Vouchers have been used to reimburse patients for OOP costs incurred, including for indirect costs like transportation to facilities. Health savings accounts can also be used as way to save in advance for health care costs. Overall, there are a wide set of policies that could be used to address CHE, but the right policy depends on the other elements in place in the health system.

4 Conclusion

This report presented an overview of the concept of financial risk protection, one of the key outcomes of health systems. While substantial analysis and data pertain to this outcome, there remains much unknown about financial risk indicators. Much of the existing research does not address the drivers of poor performance in this area and rigorously evaluate policies that am to improve financial risk protection. In depth analysis is required to understand drivers and policies, and advance health systems toward this goal.

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