How to do (or not to do) ... a health financing incidence analysis

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Abstract

Financing incidence analysis (FIA) assesses how the burden of health financing is distributed in relation to household ability to pay (ATP). In a progressive financing system, poorer households contribute a smaller proportion of their ATP to finance health services compared to richer households. A system is regressive when the poor contribute proportionately more. Equitable health financing is often associated with progressivity. To conduct a comprehensive FIA, detailed household survey data containing reliable information on both a cardinal measure of household ATP and variables for extracting contributions to health services via taxes, health insurance and out-of-pocket (OOP) payments are required. Further, data on health financing mix are needed to assess overall FIA. Two major approaches to conducting FIA described in this article include the structural progressivity approach that assesses how the share of ATP (e.g. income) spent on health services varies by quantiles, and the effective progressivity approach that uses indices of progressivity such as the Kakwani index. This article provides some detailed practical steps for analysts to conduct FIA. This includes the data requirements, data sources, how to extract or estimate health payments from survey data and the methods for assessing FIA. It also discusses data deficiencies that are common in many low- and middle-income countries (LMICs). The results of FIA are useful in designing policies to achieve an equitable health system.

Keywords: Financing incidence analysis, progressivity, regressivity, health financing, ability-to-pay, methodology

Key Messages

• Financing incidence analysis (FIA) requires the availability of comprehensive household survey data that contain information on a cardinal measure of ability to pay (ATP) such as income or expenditure and relevant variables to extract or estimate household contributions via various health financing mechanisms

• Progressive health financing is usually preferred to regressive health financing because it places less burden on poorer households relative to richer households. Researchers should be cautious however as progressive health financing can sometimes result from unfair treatment of the poor.
Introduction

Fairness in a country’s health financing system is a key dimension to assess a health system’s performance (World Health Organization, 2000). In fact, it has been noted that equity or fairness in health financing, where households contribute to the health system according to their ability to pay (ATP), should form an important health system goal to promote universal health coverage (UHC) (Kurtz, 2013). Financing incidence analysis (FIA) is a way to assess how equitable a health financing system is. In general, an equitable health system requires inter alia equity in health care financing and utilization, defined respectively as payment for health services according to ATP and the receipt of health service benefits according to need (Mills et al. 2012).

This article, which focuses on FIA complements an earlier article in this series which explains how to do (or not to do) a benefit incidence analysis (BIA) (McIntyre and Ataguba 2011). It is written to provide an introductory and detailed guide to FIA that will be accessible to different groups including researchers, data analysts and practitioners.

The rest of the article is structured as follows. The next section provides an overview of FIA. This is followed by an introduction to the different ways of assessing FIA. Thereafter, a detailed overview of how to conduct an empirical assessment of FIA is presented including worked examples. The last section provides a brief discussion of issues including the strengths and weaknesses of the approach.

What is FIA?

FIA is an analytical method used for comprehensively evaluating equity in health financing including the equity impact of UHC reforms relating to the health financing system. Some authors refer to FIA as progressivity analysis or just the analysis of equity in health care financing. FIA assesses the distribution of the ‘burden’ of health financing in a population stratified by household ATP and sometimes the extent to which this burden affects the underlying dis-benefit according to need (McIntyre and Ataguba 2011; Wagstaff, 2012). Together, these analyses (FIA and BIA), which have been combined in recent research (Akazili et al. 2012; Ataguba and McIntyre 2012; Mtei et al. 2012; Kwesiga et al. 2015; Asante et al. 2017), provide an overall picture of how the health financing system of a country is performing on equity grounds and progressing towards UHC. For a holistic picture of equity, practitioners are encouraged to assess both distributions.

Different ways to assessing FIA

Countries vary in their health-care financing mixes. FIA can be conducted for individual health-care financing mechanisms and/or on the entire health financing system, comprising all the health-care financing mechanisms. Conceptual basis and empirical methods for FIA originate mainly within the economics discipline. We discuss the methods in turn with emphasis on the widely used approaches.

Structural progressivity

This is the simplest and perhaps one of the earliest ways to crudely assess progressivity. It makes no reference to the distribution of ATP (Khetan and Poddar 1976; Schuler and Terry 1983). Empirically, for health services, it has been assessed by looking at how payments for health care as a share of ATP vary by quantiles of ATP (Ugá and Santos 2007; Prakongsai et al. 2009; Akazili et al. 2011; Mills et al. 2012). An example of structural progressivity is illustrated in Figure 2. First, households are categorized into quantiles of ATP (e.g. tertiles, quartiles, quintiles, deciles, etc.) to assess progressivity. The share of ATP that each quantile spent on health care via each mechanism (for instance general tax, out-of-pocket (OOP) payments, social insurance contribution, etc.) is computed. Next, an examination of how the ratios vary across quantiles (i.e. the analogue of average tax rate) vary across quantiles is used to assess progressivity. If the ratios are increasing with the quantiles of ATP, that health-care financing mechanism is considered progressive. It is regressive if the reverse is the case. If the ratios remain constant for all quantiles, health-care financing is considered as proportional. While the assessment of structural progressivity has an appeal, it has some limitations especially as it has been applied in health financing. For example, if quantiles are used, progressivity is not sensitive to variations that may occur close to the cut-off points for each quantile. Also, it does not show a holistic picture of how health-care payment to ATP ratio varies across the entire distribution of ATP. More importantly for policy, the exact extent of progressivity may not be obtained simply by looking at these ratios. In fact, in some situations it could be difficult to distinguish which mechanism is more progressive or less regressive than the other. Although it is not used in empirical assessment of progressivity in health financing, some degree of progressivity may be obtained using the structural progressivity approach. This is simply the slope coefficient of the curve that plots the relationship between each household’s average payment share and ATP where households are ranked by increasing ATP (Schuler and Terry 1983).

Effective progressivity

The pioneering effort in defining effective progressivity in the broader economics literature is traced to the work of Musgrave and Thin (1948). Subsequently, several indices have been proposed to
assess progressivity mainly within the context of taxes (see e.g. Kakwani, 1977; Suits, 1977; Slesnick, 1986). These indices are often referred to as measures of effective progressivity as opposed to structural progressivity.

The most popular of these indices that will be considered in this article is the Kakwani index (Kakwani, 1977). This index is based on two underlying curves—the Lorenz curve of ATP distribution and the concentration curve of health-care payments (see Figure 1). A progressive health financing mechanism or system, as shown in Figure 1a occurs when the Lorenz curve of pre-payment ATP lies above the concentration curve of health-care payments and the extent of progressivity, that is the Kakwani index is defined as two times the area between the Lorenz curve of ATP and the concentration curve of health-care payments. The Kakwani index ranges from 1 (a situation where the poorest household contributes all health-care payments) to 1.0 (where all health-care payments are made by the richest household).

A negative concentration index means that the concentration curve of health-care payments lies above the line of equality while a positive value means that the concentration curve lies below the line of equality.

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In an empirical analysis, the Kakwani index is computed from the Gini index and the concentration index that are associated with the Lorenz curve and the concentration curve, respectively (Kakwani, 1977; Kakwani et al. 1997) (see Table 1).

The Kakwani index is a summary measure. As such, it is sometimes complemented with statistical dominance tests using statistical software to ascertain whether progressivity or regressivity is consistent along the entire distribution of ATP (i.e. whether the Lorenz and concentration curves cross) and/or which financing mechanism is more progressive or less regressive than the other (i.e. whether concentration indices do not cross) (Bishop et al. 1994; Davidson and Duclos 1997). Dominance tests can also be performed to assess progressivity over time (Ataguba, 2016). Many empirical analyses

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**Table 1. A summary of the selected indices for assessing equity in health financing**

<table>
<thead>
<tr>
<th>Index type</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>The Gini index</td>
<td>This is obtained from the Lorenz curve that plots the cumulative percentage of ATP (e.g. income) against the cumulative percentage of the population, usually ranked by ATP. The Gini index corresponds to the ratio of the area between the line of equality (i.e. the 45° line) and the Lorenz curve of ATP to the area between the line of equality and the line of perfect inequality. The Gini index ranges from 0 (a case of perfect equality in the distribution of ATP) to +1 (a case of perfect inequality in the distribution of ATP). The closer the value of the Gini index is to +1, the less unequal is the distribution of ATP while the closer the Gini index is to 0, the more equal is the distribution of ATP.</td>
</tr>
<tr>
<td>The concentration index</td>
<td>This is obtained from the concentration curve that plots the cumulative percentage of health-care payments (e.g. private health insurance) against the cumulative percentage of the population, ranked by ATP (see Figure 1). The concentration index corresponds to twice the area between the line of equality (i.e. the 45° line) and the concentration curve of health-care payments. The concentration index ranges from −1.0 (a situation where the poorest household contributes all health-care payments) to +1.0 (where all health-care payments are made by the richest household). A negative concentration index means that the concentration curve of health-care payments lies below the line of equality while a positive value means that the concentration curve lies above the line of equality while a positive value means that the concentration curve lies below the line of equality.</td>
</tr>
<tr>
<td>The Kakwani index</td>
<td>For any health-care financing mechanism j, the Kakwani index of progressivity (πj) is obtained as the difference between the concentration index of health-care payments (Cj) and the Gini index of ATP inequality (G). That is, πj = Cj − G. The Kakwani index corresponds to twice the area between the Lorenz curve of ATP and the concentration curve of health-care payments. Its values lie between −2 (the most regressive financing) and +2 (the most progressive financing). Theoretically, the case of proportional financing corresponds to πj = 0. A positive value (πj &gt; 0) means that the health financing mechanism j is progressive as richer households contribute proportionately more than their share of ATP. A negative value (πj &lt; 0) implies that the health financing mechanism is regressive as the proportion of health-care payments contributed by poorer households is greater than their share of ATP.</td>
</tr>
</tbody>
</table>

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**Figure 1.** An illustration of a progressive and regressive health financing. Note: ATP = Ability to pay. Source: Authors’ illustration
have used the multiple comparison approach (MCA)\(^3\) for the dominance tests (O’Donnell et al. 2008b).

Computing the Gini, concentration and Kakwani indices

The Gini and concentration indices (\(I_{GC}\)), hence the Kakwani index, can be computed using various formulas. One of the simplest ways to compute the Gini or concentration index is using the ‘convenient covariance’ formulation (i.e. in terms of the covariance between the relevant variable and the rank of pre-payment ATP) (Kakwani, 1980; Lerman and Yitzhaki 1989). This is shown as:

\[
I_{GC} = 2 \times \text{cov}(y, r)/\mu_y
\]

where \(y\) is either pre-payment ATP (for the Gini index) or healthcare payments (for the concentration index), \(r\) is the rank of ATP and \(\mu_y\) is the mean of \(y\). Another common approach used to compute \(I_{GC}\) is the convenient regression approach (Kakwani et al. 1997). A collection of Stata commands to compute \(I_{GC}\) and the Kakwani index can be found in O’Donnell et al. (2008b). Also, these indices can be estimated using the World Bank ADcPT software (www.worldbank.org/adcpt). Due to space limitation, we did not provide all the methods for computing these indices but refer readers to Duclos and Araar (2006) and O’Donnell et al. (2008b) for a detailed exposition of these methods. A user-friendly Stata ado-file (-fia-), which produces results for structural progressivity and the Kakwani index, has been written. This can be made available upon request.

Empirical assessment of FIA

Some empirical analyses have been conducted using the structural progressivity approach (Ugá and Santos 2007; Akazili et al. 2011; Mills et al. 2012) and the effective progressivity approach (via the Kakwani index) (Wagstaff and van Doorslaer 1997; Wagstaff et al. 1999). Some authors present results using both approaches (see Asante et al. 2016). Detailed steps and procedures for assessing FIA are presented in Table 2. The table also provides a summary of the data requirements and issues that analysts need to take note of when conducting FIA.

Three key issues that emerge from Table 2 that need further explanation include (i) the process of extracting or estimating the various health-care payment variables including the assumptions about who bears the final burden of such payments (Table 3 contains details of the various assumptions that researchers have used to extract health payments from household surveys), (ii) the different measures of household ATP for FIA (see Box 1) and (iii) the computation of per capita or per adult equivalent health-care payments and ATP (e.g. income or expenditure) (see Box 2).

In what follows, examples of structural and effective progressivity are presented using South Africa as the case study.

Assessing progressivity of health financing in South Africa

South Africa, a sub-Saharan African country with reliable data sources, finances health services via three broad mechanisms—general taxes (~38% of total health finances), private health insurance (~50%) and OOP payments (~12%) (Ataguba and McIntyre 2018).

Data sourcing, cleaning and extraction

The nationally representative Income and Expenditure Survey dataset for 2011/12 was used to extract household contributions to taxes, OOP payments and private health insurance (Ataguba and McIntyre 2018). Because not all tax revenue is allocated to the health sector, only about 11% of total tax extracted was considered for analysis (see Table 2). ATP was measured using per adult equivalent consumption expenditure. In terms of the final burden of each financing mechanism, direct taxes are borne by the legal tax payer, indirect taxes by consumers, private health insurance by the insured household or individual and OOP payments by the users of health services. Due to space limitation, we refer the reader to Ataguba and McIntyre (2018) for details on how contributions for each health financing mechanism were extracted for each household.

Estimating the progressivity of each health financing mechanism

Structural progressivity was assessed by categorizing households into quintiles of ATP. Then, the average fraction of ATP that households in each quintile spends on each health financing mechanism was computed.

The results shown in Figure 2 indicate that OOP spending and indirect taxes are regressive. The richest quintile (i.e. the top 20% of the population in terms of ATP) pay less as a proportion of their income than the poorest 20% of the population. Direct taxes, total taxes and private health insurance are progressive because the bottom 20% of the population contributes less as a proportion of their ATP compared to the higher quintiles.

Effective progressivity was assessed using the Kakwani index of progressivity. The conclusions based on the results shown in Table 4 are similar to those shown in Figure 2. Indirect taxes and OOP payments are regressive (negative Kakwani indices) while direct taxes, total taxes and private health insurance are progressive (positive Kakwani indices). These results are also confirmed by the test of statistical dominance.

Estimating overall progressivity of health financing

Overall, health-care financing is progressive in South Africa. This is the case for both the structural and effective progressivity approaches. As shown in Figure 2, the bottom 20% of the population spends about 5% of their ATP financing health services compared to about 15% spent by the richest quintile. Also in Table 4, the Kakwani index of overall health financing in South Africa was estimated at 0.101 [i.e. (0.38 * 0.0824) + (0.12 * (−0.0289)) + (0.50 * 0.1417) = −0.10]. Ataguba and McIntyre (2018) exercise caution in interpreting these progressivity results since the major driver (private health insurance) covers <20% of the South African population who are mainly the rich. In fact, Ataguba and McIntyre (2018) showed that contributions to private health insurance were regressive among those that are insured.

Interpreting results for policy

Although the share of OOP payments in total health financing in South Africa is low, the regressive of this means that there is a need to avoid increasing this burden either through increased co-payments or user fees. In South Africa, general taxes contribute significantly to total health financing and they are progressive. Thus, an increased reliance on especially direct taxes will yield a progressive total health financing, all things being equal. Recently, the South African government is in the process of reforming the health sector. Therefore, these findings will provide baseline information in terms of useful progressive mechanisms for financing their national health system.
Table 2. Detailed steps and processes involved in conducting FIA

Step 1: Data sourcing, cleaning and extraction

<table>
<thead>
<tr>
<th>Activity</th>
<th>Requirement</th>
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</thead>
<tbody>
<tr>
<td>Extract or estimate each household’s total contribution to each health financing mechanism (e.g. OOP spending, direct taxes, indirect taxes, earmarked taxes, private and social health insurance contributions, etc.). Preferably, this should be expressed as annual contributions.</td>
<td>Detailed survey data (usually nationally representative) that contain information on ATP (e.g. income or expenditure) and other relevant data for assessing health payments. Typical examples of datasets for national analysis include the Living Standards Measurement Surveys, Living Conditions Monitoring Surveys, Income and Expenditure Surveys, Household Budget Surveys, Consumer Expenditure Surveys, Survey of Household Spending and Health Expenditure &amp; Utilization surveys.</td>
</tr>
<tr>
<td>Compute each household’s income or expenditure (i.e. the household pre-payment income)—a measure of ATP. This should be gross of all health-care payments. It should also be annualized as some items like frequent purchases have a short recall period while non-frequent purchases have longer recall periods.</td>
<td>Typical sources of data include the national statistical authority, international data repositories or databanks and research institutions.</td>
</tr>
<tr>
<td>Estimate household size (or an adult equivalent household size that accounts for the composition of the household) using the same dataset.</td>
<td>Different parameter values are required for estimating adult equivalent household size depending on the adult equivalent scale that is selected. This is explained in Box 2.</td>
</tr>
</tbody>
</table>

Remark

- The measure of ATP and all health-care payments should be extracted from the same dataset. They should be expressed in the same time frequency (preferably annual).
- In the case where health expenditures are not directly reported but are estimated (e.g. many indirect taxes), things like the structure of tax rates, tax brackets as well as any rebate or tax exemptions are necessary. This information is usually contained in government reports and published papers. Also, reliable assumptions about who bears the final burden of each payment are needed to extract them (see Table 3).
- In some cases, data on health payments may be limited in household surveys (Borghi et al. 2009) as these surveys were not designed primarily for health expenditure. It is important to note limitations in these data, if any, for FIA (see the discussion section).
- Where a household does not contribute to a specific health financing mechanism, their payment should be recorded as zero. For example, if household A did not pay OOP for health services, OOP spending for this household should be recorded as zero and not missing. This has implications for estimation in many software including Stata.
- In some cases (especially non-earmarked taxes), not all the contributions extracted or estimated are allocated to the health sector. Thus, only the proportion that is allocated to the health sector should be considered. For example, if only 15% of total non-earmarked tax revenue is allocated to the health sector, tax estimates need to be scaled by 15%.
- Where nationally representative household data are not available, it is possible for researchers to commission primary surveys for FIA (Borghi et al. 2009). However, this process can be very costly. Alternatively, analysts can lobby for relevant questions to be incorporated into already existing surveys.

Step 2: Estimating the progressivity of each health-care financing mechanism

<table>
<thead>
<tr>
<th>Activity</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate the progressivity of each health-care financing mechanism after adjusting for a measure of household size (or adult equivalent household size) either using the structural or effective progressivity approach.</td>
<td>Extracted or estimated contributions for all the relevant health financing mechanisms by all households. These are used to compute progressivity.</td>
</tr>
<tr>
<td>The structural progressivity approach involves categorizing households into quantiles (e.g. quartiles or quintiles) of pre-payment ATP. For each quantile, an estimate of health-care payment as a fraction of ATP (i.e. average payment share) is computed by applying the appropriate household weights.</td>
<td>Each household’s estimated ATP (i.e. income or expenditure) before any health-care payment from the same nationally representative survey data.</td>
</tr>
<tr>
<td>The effective progressivity approach (e.g. using the Kakwani index) involves applying a computer routine (e.g. -fiar-) to obtain the index.</td>
<td>The dataset should contain relevant variables that show the detailed sample design of the dataset. This should include the primary sampling unit, the strata variable and household weight necessary to make estimates reflect national figures.</td>
</tr>
</tbody>
</table>

Remark

- All health-care payments (including taxes, private or social insurance contributions, or OOP spending) estimated at the household level should be divided by a measure of household size (e.g. actual number of people in that household or an estimated adult equivalent household size). The appropriate household weight should be applied when estimating progressivity to obtain estimates that are reflective of the entire country or region of reference.
- In the case of structural progressivity assessments where some form of average payment rates are computed, it is necessary to adjust all relevant variables to reflect national aggregates. For example, comparing the extracted direct tax estimates with that reported by the national tax authority and adjusting the tax variable accordingly (see e.g. Borghi et al. 2009).

Step 3: Assessing overall progressivity in health-care financing

<table>
<thead>
<tr>
<th>Activity</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural progressivity: this can be assessed in two ways: (1) adding up all the extracted health-care payment variables for each household and computing the average payment shares by quantiles or (2) adding up the average payment share of each health-care financing mechanism by quantiles.</td>
<td>Adult equivalent household size should be divided by a measure of household size (e.g. actual number of people in that household or an estimated adult equivalent household size). The appropriate household weight should be applied when estimating progressivity to obtain estimates that are reflective of the entire country or region of reference.</td>
</tr>
<tr>
<td>Effective progressivity: the additively separable property of the Kakwani index allows for the weighting of the estimated index of each mechanism by the share of that financing mechanism in total health financing. This is used to obtain overall progressivity for that country.</td>
<td>In the case where health expenditures are not directly reported but are estimated (e.g. many indirect taxes), things like the structure of tax rates, tax brackets as well as any rebate or tax exemptions are necessary. This information is usually contained in government reports and published papers. Also, reliable assumptions about who bears the final burden of each payment are needed to extract them (see Table 3).</td>
</tr>
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(continued)
Taxes For taxes, except for personal income tax, the final burden may be shifted away from the entity that was initially levied. Private and social financing arrangements in a country. This includes a careful and thorough examination of how equitable its health financing system is. Such analysis is useful for assessing how each health financing mechanism deviates from proportionality and for assessing how progressive or regressive an entire health financing system is. Regressive financing is usually considered as unfair as it places a heavier burden on the poor. Although progressive health financing is preferred, such a result needs to be critically examined within the context of the health financing arrangements in a country. This includes a careful and structured analysis.

### Discussion

FIA remains an important analysis for countries wanting to assess how equitable their health financing system is. Such analysis is useful for assessing how each health financing mechanism deviates from proportionality and for assessing how progressive or regressive an entire health financing system is. Regressive financing is usually considered as unfair as it places a heavier burden on the poor. Although progressive health financing is preferred, such a result needs to be critically examined within the context of the health financing arrangements in a country. This includes a careful and thorough examination of how equitable its health financing system is. Such analysis is useful for assessing how each health financing mechanism deviates from proportionality and for assessing how progressive or regressive an entire health financing system is.
regarded as ‘fair’. This is opposed to the case where a progressive OOP spending is primarily because the poor are unable to afford and/or use health services. Also, if private voluntary health insurance constitutes a large share of total financing and it is progressive, it may not mean that the entire health financing system is equitable per se as discussed in Ataguba and McIntyre (2012).

Thus, FIA should not necessarily be an end but a means to an end—that is ensuring equity in the entire health system. FIA results, combined with a detailed BIA can be used to inform policy towards ensuring UHC. One way to use the results is to reassess overall progressivity in health financing for a country and to reduce reliance on regressive financing mechanisms. For example, if OOP spending comprises 50% of a country’s total health financing and it is estimated as a regressive financing mechanism, a reduction in this share is likely to have a ‘positive’ effect on overall progressivity as discussed in Table 2. This is because the overall Kakwani index is the weighted sum of the Kakwani indices of each health financing mechanism.

As noted earlier, the availability of quality household survey data remains a sine qua non for a good FIA. The data should contain information on a cardinal measure of ATP, and information relevant for extracting each household’s contribution towards most, if not all, the health financing mechanisms. Unfortunately, many LMICs face the challenge of poor quality household survey data or the absence of routine data for the assessment of FIA. When data for estimating contributions via any health financing information are not available, assumptions may be used to estimate this directly from the survey. However, if this is omitted, its impact on the final results needs to be noted. In a case where there is a general absence of reliable household survey data, McIntyre and Kutzin (2016) discuss an interim measure to provide some reasonable approximation of how progressive or regressive each mechanism may be. In the long term, there will be a need for countries to invest in the collection of reliable routine data for monitoring progress towards a progressive and equitable health financing system. In many cases, there may not be a need for an ‘entirely new’ survey. A module that will elicit relevant (or missing) health expenditure and/or ATP variables may be added to an existing routine household survey. In general, it is important that comprehensive household survey data contain enough information as outlined in Table 2 for conducting FIA.

Routine FIA can be useful not only for assessing progress towards UHC but also for assessing areas where action is needed for the country to ensure that the health system is treating households

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**Box 1: Different measures of household ATP for FIA**

The measurement of ATP is a key element of FIA. There has been widespread debate about the most appropriate measure of ATP ranging from permanent income to consumption expenditure (Buehler, 1945; Wagstaff and van Doorslaer 1993; Miller, 2005). In general, there are a few options for estimating ATP for FIA. In developed countries, apart from a few studies that use expenditure (Lancaster et al. 1999), income is often the preferred measure. In developing countries, however, expenditure or consumption is usually the preferred measure (Younger et al. 1999; Sahn and Stifel 2003; O’Donnell et al. 2008a,b). The use of expenditure in many developing countries is attributed to the difficulties inherent in measuring income, ‘the seasonal variability in such earnings, and the large shares of income … from self-employment both in and outside of agriculture’ (Sahn and Stifel 2003, p. 464) that may not be recorded by households as income (O’Donnell et al. 2008b). The large informal sector in developing countries also contributes to the unreliability of income. Income may also be concealed to evade taxation (Lancaster et al. 1999). A more robust measure of ATP is household consumption expenditure that measures long-term welfare level rather than current income (Blundell and Preston 1999). This includes the value of non-market consumptions in addition to household frequent and non-frequent purchases. In empirical studies, it is defined as the ‘[f]inal use of goods and services, excluding the intermediate use of some goods and services in the production of others’ (O’Donnell et al. 2008b, p. 70). Thus, depending on the availability of indicators for ATP, only cardinal measures of ATP rather than ordinal measures are used for assessing progressivity or FIA.

**Box 2: Computing per capita or per adult equivalent health-care payments and ATP**

Per adult equivalent household size can be computed in many ways. One of the most popular ways is to define an adult equivalent scale (ES) as (Deaton, 1997):

$$ES = (A + \alpha C)^{\frac{1}{2}}$$

where A is the number of adults in the household, C is the number of children, \(\alpha\) is a measure of the relative weight accorded to children and \(\theta\) is a measure of economies of scale. If the value of \(\theta\) gets closer to 1, then the consumption of a child is assumed to be almost equivalent to that of an adult. If the value of \(\theta\) gets closer to 1 it signifies the absence of economies of scale such that larger households, on average, do not live more cheaply than smaller households. When \(\theta = \theta = 1\), ES becomes the total household size and this is used to estimate per capita ATP and per capita health-care payments. Deaton and Zaidi (2002) suggest that, for developing countries, the value of \(\theta\) should be between 0.75 and 1.0 while the value of \(\alpha\) should lie between 0.3 and 0.5. This is because of the relative importance of food in total consumption, and the limited scope for economies of scale. So, if a household has 2 children and 2 adults, and we set \(\alpha\) and \(\theta\) to be 0.5 and 0.75, respectively, then ES = 2.28 meaning that there are about 2.28 equivalent adults in that household even though the total household size is 4 persons. If income is used as a measure of ATP, per adult equivalent income and per adult equivalent health-care payments are obtained by dividing total household income and total household health-care payments by the value of ES for each household.

As noted earlier, the availability of quality household survey data remains a sine qua non for a good FIA. The data should contain information on a cardinal measure of ATP, and information relevant for extracting each household’s contribution towards most, if not all, the health financing mechanisms. Unfortunately, many LMICs face the challenge of poor quality household survey data or the absence of routine data for the assessment of FIA. When data for estimating contributions via any health financing mechanism are not comprehensive, the analyst needs to recognize this and note its impact on the FIA results. For example, contributions towards social health insurance may come from both the employer and the employee. If a dataset does not contain information on the employer’s contribution, assumptions may be used to estimate this directly from the survey. However, if this is omitted, its impact on the final results needs to be noted. In a case where there is a general absence of reliable household survey data, McIntyre and Kutzin (2016) discuss an interim measure to provide some reasonable approximation of how progressive or regressive each mechanism may be. In the long term, there will be a need for countries to invest in the collection of reliable routine data for monitoring progress towards a progressive and equitable health financing system. In many cases, there may not be a need for an ‘entirely new’ survey. A module that will elicit relevant (or missing) health expenditure and/or ATP variables may be added to an existing routine household survey. In general, it is important that comprehensive household survey data contain enough information as outlined in Table 2 for conducting FIA.

Routine FIA can be useful not only for assessing progress towards UHC but also for assessing areas where action is needed for the country to ensure that the health system is treating households
fairly. Where necessary, FIA results should inform policy choices towards a better performing health system.

Note
1. In Stata, -dominance- command written by Owen O'Donnell can be used to perform statistical dominance tests. http://siterepos.worldbank.org/INTPAH/Resources/Publications/459843-1195594469249/dominance.ado

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References


