

How to do (or not to do) . . . a benefit incidence analysis

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Benefit incidence analysis (BIA) considers who (in terms of socio-economic groups) receive what benefit from using health services. While traditionally BIA has focused on only publicly funded health services, to assess whether or not public subsidies are ‘pro-poor’, the same methodological approach can be used to assess how well the overall health system is performing in terms of the distribution of service benefits. This is becoming increasingly important in the context of the growing emphasis on promoting universal health systems. To conduct a BIA, a household survey dataset that incorporates both information on health service utilization and some measure of socio-economic status is required. The other core data requirement is unit costs of different types of health service. When utilization rates are combined with unit costs for different health services, the distribution of benefits from using services, expressed in monetary terms, can be estimated and compared with the distribution of the need for health care. This paper aims to provide an introduction to the methods used in the ‘traditional’ public sector BIA, and how the same methods can be applied to undertake an assessment of the whole health system. We consider what data are required, potential sources of data, deficiencies in data frequently available in low- and middle-income countries, and how these data should be analysed.

Keywords Benefit incidence analysis, household survey design, methodology

KEY MESSAGES

- The most important ingredient for an accurate and comprehensive benefit incidence analysis is a household survey that collects data on *all* outpatient visits and hospital admissions during specified recall periods, rather than only on one visit or admission as is the case in most ‘standard’ surveys at present, and which provides disaggregated data on the type of provider used.
- Benefit incidence analysis does not have to be confined to assessing the distribution of public subsidies for health services; instead, it can be a powerful means of evaluating the performance of the service delivery component of the overall health system.
- The appropriateness of the distribution of benefits from using health services should be assessed relative to the distribution of need for health care across socio-economic groups.

Introduction

Benefit incidence analysis (BIA) is a technique that has traditionally been used to assess the distributional impact of government spending on health care, or more specifically the extent to which different socio-economic groups benefit from government subsidies. The underlying premise of such analyses is that government funds, and the services provided with these funds, should disproportionately benefit the lowest socio-economic groups and a BIA is conducted to assess whether government spending is in fact 'pro-poor' or not. This presupposes that public spending should promote efficiency through correcting for various market failures, and also promote equity by improving the distribution of economic welfare (Van de Walle 1995). The World Bank has conducted most of the BIA studies in low- and middle-income countries and has focused particularly on the distribution of benefits (or subsidies) from publicly funded education and health services (Demery *et al.* 1995; Castro-Leal 1996; Castro-Leal *et al.* 1999; Castro-Leal *et al.* 2000; Sahn and Younger 2000; van de Walle 2003). It has also been more widely applied in recent years (O'Donnell *et al.* 2007).

While a key policy concern may be ensuring that *government* health care resources are 'well targeted', within the context of the growing emphasis on promoting universal health systems (World Health Organization 2005), it is also important to consider how well the overall health system is performing in terms of the distribution of service benefits. There is widespread agreement that the benefits of health services should be distributed across a population according to individuals' need for health care rather than on the basis of their ability to pay for care or place of residence (e.g. in a rural versus an urban area) (Wagstaff and Van Doorslaer 1993). Thus, BIA can usefully be applied to assessing the appropriateness of the distribution of benefits from using any health service relative to the need for care.

This paper aims to provide an introductory guide to the methods used in the 'traditional' public sector BIA, and how the same methods can be applied to undertake an assessment of the whole health system. We consider what data are required, potential sources of data, deficiencies in data frequently available in low- and middle-income countries, and how these data should be analysed. In addressing these issues, we draw on our experience of conducting a comprehensive BIA of the overall health system in South Africa.

What is BIA?

Historically, BIA has tried to answer the question: 'Who, in terms of socio-economic groups, is receiving what benefits from using (public) health services?' Benefits are expressed in monetary terms and are essentially calculated by multiplying utilization rates of different types of health service by their unit costs. More recently, another question has been added more explicitly in some studies: 'Is this distribution of benefits appropriate, i.e. are benefits distributed in line with needs?'

There are a number of steps in undertaking a BIA, namely:

- (1) select a measure of living standard or socio-economic status (SES) and rank the population from poorest to richest;

- (2) estimate the utilization of different types of health service by individuals/different socio-economic groups (services such as primary level clinics, district hospitals, regional hospitals and central hospitals in the case of public sector services; if considering private sector services as well, categories such as general practitioners, specialists, retail pharmacies and private hospitals);
- (3) calculate the unit cost of each type of health service (or in the case of private for-profit providers, the term unit price of different services is more appropriate, but for simplicity, we refer to unit costs in the rest of the paper);
- (4) multiply utilization rates by unit costs for each type of health service for each individual/socio-economic group;
- (5) if the distribution of *public subsidies* only is being considered, deduct direct user fee or out-of-pocket payments for each type of health service for each individual/socio-economic group;
- (6) aggregate benefits of utilization (or of public subsidies), expressed in monetary terms, across different types of health service for each individual/socio-economic group; and
- (7) compare the distribution of health service benefits (or of public subsidies) to some target distribution (e.g. relative to need for health care).

The rest of this paper considers these steps in greater detail, particularly the measurement of utilization rates and unit costs, alternative ways of analysing the distribution of service benefits and the assessment of the appropriateness of this benefit distribution. As the primary focus of this paper is not to review the advantages and disadvantages of alternative measures of socio-economic status, this issue is not considered further. Suffice to say that any measure (cardinal or ordinal) of living standard or socio-economic status—such as income, consumption expenditure, consumption or a composite index of socio-economic status as in an 'asset index'—can be used in a BIA. However, there may be limitations to the extent of analysis that can be performed depending on whether a cardinal or ordinal measure is used. Readers are referred to O'Donnell *et al.* (2008) and Deaton (1997) for a review of these SES measures and the impact of the choice on the extent of analysis feasible.

Collecting and analysing utilization data

A household survey dataset that incorporates both information on health service utilization *and* some measure of socio-economic status is required for a BIA. A number of national household surveys that include health-related components are routinely undertaken in low- and middle-income countries, including the Demographic and Health Survey (DHS) and the Living Standards Measurement Survey (LSMS). These surveys have been developed and implemented by various international organizations: USAID's MEASURE programme (incorporating Macro International) for the DHS, and the World Bank for the LSMS. Unfortunately, these surveys do not provide an adequate basis for accurate and comprehensive BIA. The DHS, for instance, usually does not collect any information on health service utilization and so cannot be used for BIA at all.

The LSMS collects utilization information, but generally does not allow for the calculation of accurate *utilization rates*.

There are a number of deficiencies in terms of the measurement of health service utilization in the LSMS and similar household surveys that national statistical offices conduct on a routine basis, such as household budget surveys (HBSS), which are primarily designed to measure household income and expenditure rather than collect health-related data. Although there is a growing trend towards undertaking specific health care utilization and expenditure surveys, they sometimes have similar deficiencies. Utilization information in many household surveys is dependent on self-reported recent illness, i.e. utilization information is only collected if a respondent indicates that they or another household member has been ill or injured within a specified recall period, and then service utilization information is only collected in relation to that self-reported illness episode. This means that health service use for other reasons (e.g. for antenatal care, other preventive services, deliveries, etc.) is not reported. In addition, and more importantly, these surveys usually only ask about the use of one service, while many people use more than one service or have multiple visits to the same service provider during an illness episode. People could also have multiple illness episodes within a year that could lead to more than one hospitalization/admission.

The data in these surveys are most frequently used simply to indicate the percentage of the population that visited a health service within the specified recall period (usually 2 weeks, 4 weeks or a month), rather than allowing for the calculation of accurate *utilization rates*, i.e. the average number of outpatient visits per person or hospital admissions or inpatient days per 1000 people per year. Further, where utilization is collected in these surveys, hospital utilization is not disaggregated by the level of care (e.g. district hospital, central hospital). This makes it difficult to estimate accurately benefits or subsidies accruing to users at different hospital levels.

Ideally, the household survey used for a BIA should ask about *any* outpatient health service utilization in the preceding few weeks (i.e. should not be restricted to use in relation to self-reported illness) and obtain information on all visits (i.e. multiple visits to the same provider and visits to more than one service provider) and likewise in relation to hospital admissions.¹ In our study in South Africa, this required us to undertake a specifically designed national household survey ourselves (called the SACBIA—South African Consortium for Benefit Incidence Analysis—survey), which is clearly not feasible in most countries. Instead, researchers and health ministries will have to rely on existing household surveys, and acknowledge their limitations, and to lobby relevant international organizations and national statistics bureaus to refine the collection of health service utilization data in household surveys. Indeed, there has already been some progress in this regard with countries such as Kenya including these more comprehensive utilization questions in their Household Health Expenditure and Utilization survey.

Table 1 demonstrates the importance of collecting data on multiple visits during the recall period, using data from the South African SACBIA survey. It shows the magnitude of the visits and admissions that are 'lost' in traditional household

Table 1 Multiple visits and admissions within the recall periods

Facility/service type	% of individuals with >1 outpatient visit in past month	% of individuals with >1 admissions in past year
Public clinic	16	–
District hospital	14	12
Regional hospital	16	21
Provincial or central hospital	8	15
Private general practitioner	10	–
Private specialist	17	–
Private hospital	23	14
Private dentist	6	–
Private pharmacy	13	–

Source: Analysis of SACBIA dataset.

surveys where only the last visit or admission is considered. For instance about 23% of individuals who used a private hospital for outpatient services had more than one visit to that facility in the month recall period, and for inpatient care, about 14% had more than one hospital admission to a private hospital in the year recall period. These percentages are not negligible in statistical terms. In addition to multiple visits to a specific provider, there are also instances of visits to more than one type of provider during the recall period. In the SACBIA survey, 25.7% of people who reported visiting an outpatient provider visited more than one type of provider during the recall period. Most importantly, the extent to which this occurs differs across socio-economic groups: this was the case for 26% of those in the poorest quintile but for 22% in the richest quintile.

In relation to outpatient visits, the available information on total visits must be converted into annual utilization rates, i.e. to calculate the average number of visits to an outpatient service per year per individual. If a recall period of 1 month (or 4 weeks) has been used in the survey, the total number of visits recorded in the survey is usually multiplied by 12 (or by 13) (O'Donnell *et al.* 2008).

This simple calculation can be refined to account for seasonal variations, as the total annual visits calculated based on the household survey will be under-reported (over stated) when the month of reporting is less (more) prone to specific diseases or health conditions. Seasonal adjustments can be made by taking into account the month(s) in which the survey was conducted and accessing information on total visits to health care facilities per month in the year of the survey. Where there is a strong indication that the seasonal pattern of use is relatively similar over recent years, and there are no current monthly utilization figures, the year in which data on monthly utilization are available can be used. This is often the case as monthly health utilization figures for the year of study may not be immediately available. Many countries have some form of health information system (HIS) that documents total visits to individual public sector facilities in each month. In our study in South Africa, we used the District Health Information System (DHIS) to extract monthly utilization. We were also able to get information on utilization of private sector services in each

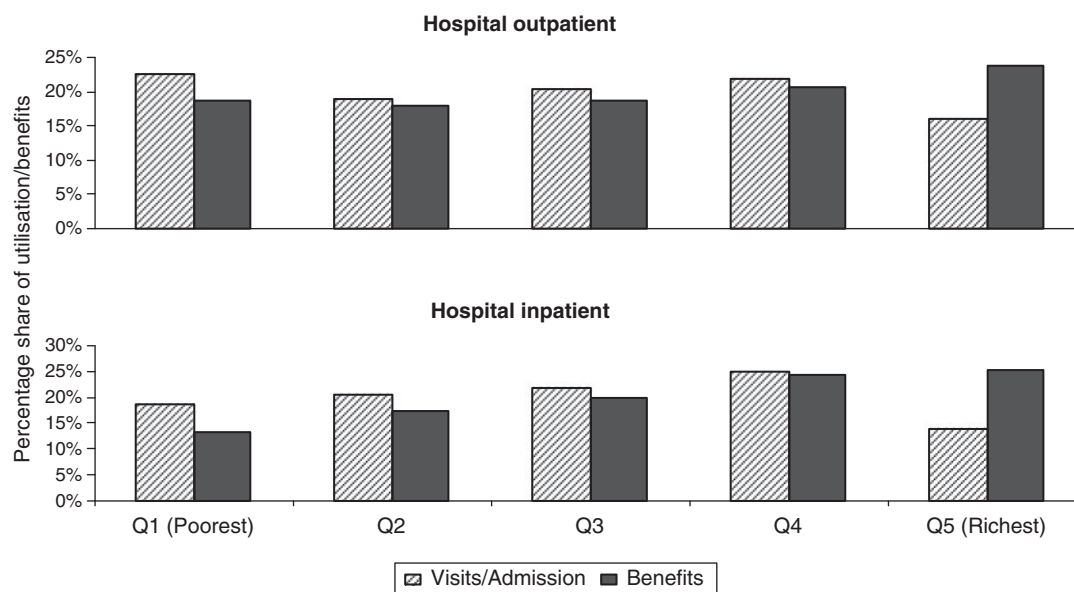


Figure 1 Illustrating the impact of aggregated hospital level data on benefit incidence results. *Source:* Analysis of SACBIA dataset

month directly from private health insurance organizations, as these services are primarily used by those with private insurance cover. A seasonality index, comparing utilization of each type of service in the month in which household survey data were collected with the average monthly utilization over a full year, can be calculated as follows:

$$SI_{jk} = \left(\sum_{i=1}^{12} U_{ik} \right) / (U_{jk}) \text{ for each } k \text{ and } U_{jk} > 0$$

where: SI_{jk} is the seasonal index for month j (the month in which the survey was conducted), U_{ik} is the total visits to a specified facility k in month i , U_{jk} is the total visits to facility k in month j .

We found that the seasonality adjustment did not dramatically affect our results. The more important issue is trying to get comprehensive utilization data rather than only information on one visit during a recall period. In addition, recall bias may result in household surveys under-reporting total utilization levels. It is advisable to triangulate total utilization estimates from the household survey with those available from other sources, such as a health ministry HIS, and adjust the household survey estimates appropriately.

Collecting and analysing cost data

Although detailed primary costing of different types of services can be undertaken for a BIA, most studies draw on datasets of total expenditure on different types of service and total utilization of those services. A key issue here is to ensure that expenditure rather than budget data are used. Frequently, data on expenditure by type of service (e.g. clinics, district hospitals etc.) are obtained from National Health Accounts (NHAs), although expenditure data could be directly obtained from the Ministry of Health if no recent NHA information is available. This is then supplemented with total utilization data, such as

from a HIS, if available. Some BIA studies simply obtain information on expenditure from a NHA or Ministry of Health and divide this by the total utilization reported in the household survey. This approach would be appropriate if there is no alternative source of accurate data on total actual utilization of health services such as a well-maintained national HIS, and if utilization estimates from the household survey have not been adjusted to equal actual utilization levels derived from a HIS (as recommended in the previous section). Whichever approach is used, there are several issues that need to be addressed in the calculation of unit costs.

In calculating unit costs, the degree of disaggregation by category of health service is dependent on what data are available from the household survey. Most household surveys merely distinguish between public and private sector services, and within the public sector category, between clinics or similar primary care facilities and hospitals. As noted earlier, greater disaggregation by type of hospital (e.g. district, regional or secondary and central or tertiary) is seldom captured. This is understandable as survey respondents may not know the category of hospital. In our South African study, we asked for the name of the hospital used (both for outpatient visits and inpatient admissions) and later coded each response according to a list of all hospitals and their categories. This is time consuming and may not be feasible in resource-constrained environments. However, if one is undertaking a household survey specifically for the BIA, it is an exercise that is well worthwhile. Figure 1 illustrates what the BIA results for public sector hospitals would have been if we only had aggregated information on utilization of a public hospital (and which would have assumed that unit costs were the same irrespective of which hospital was visited) compared with the results we did obtain with the disaggregated level of care hospital data. What this highlights is that, because higher income groups in South Africa (and probably in many other countries) tend to use

services at higher level hospitals (e.g. a central hospital rather than a district hospital), not being able to disaggregate between the different types of hospital will understate the disparities in the distribution of benefits from using health services. While the distribution of *utilization* of services is pro-poor (certainly in terms of public hospital outpatient services), when this is translated into benefits using information on utilization of different levels of care and the relative unit costs at these different types of hospital, it is clear that in fact the benefit incidence of use of public hospitals is pro-rich in the South African context. The differences arising from using disaggregated data are particularly marked for the top and the bottom quintiles in Figure 1.

Another factor that could be taken into account is the potential for variation in resourcing of health services across geographic areas. For example, clinics in one region or province may be better resourced particularly in terms of number and category of health professionals employed than clinics in another region or province. For this reason, BIA estimates may be refined by disaggregating both utilization and unit costs by geographic area.

Whether one is calculating unit costs for all public hospitals in aggregate or for each category of hospital and/or disaggregating by geographic area, a key challenge is to estimate the cost per outpatient visit versus the cost per inpatient day. Frequently, an assumption is made that the cost of an outpatient visit is a fixed proportion of the cost of an inpatient day (Xu *et al.* 2006). Most often, an outpatient visit is considered to be one-third or one-fourth of the cost of an inpatient day (or that the ratio is 0.33 or 0.25) (Barnum and Kutzin 1993; Xu *et al.* 2006). Sometimes, the ratio could vary widely (Castro-Leal *et al.* 2000). However, these are merely assumptions or a 'rule of thumb', and various studies have found that the ratio of outpatient and inpatient costs varies markedly between categories of hospital (Lombard *et al.* 1991; Xu *et al.* 2006). On this basis, Adam and Evans (2006; p. 1700) note that the 'simple rules of thumb do not prove to be an accurate basis for cost estimates'. In our study in South Africa, for public hospitals, we found that the cost of one outpatient visit was equivalent to 0.37 of the cost of an inpatient day in district hospitals, 0.42 in regional hospitals and 0.56 in the case of provincial or central hospitals (Ataguba, forthcoming). We obtain these ratios by fitting regression models on data on health care utilization and expenditure in all public hospitals at different levels in South Africa, controlling for the relative size of each hospital. This is because the hospitals were used as data points. Unit costs are then obtained by dividing the total recurrent expenditure in each hospital level by the weighted utilization figures where the weights represent the ratios generated through the statistical method.

In relation to estimating the unit costs of private sector services if a comprehensive BIA is being undertaken, a similar approach can be adopted to that for the public sector in the case of faith-based health care facilities, depending on ability to access expenditure and utilization data from these facilities. For other private sector services, the out-of-pocket expenditure reported in the household survey on these services can be used as an estimate of unit costs, particularly if there is little or no health insurance within the country. In our study, we obtained

information from the private health insurance organizations on the total value of claims submitted by members and total utilization for each type of service as the basis for estimating unit costs. We did, however, use reported out-of-pocket payments from the household survey in the case of services that are not covered by these insurance organizations, such as traditional and spiritual healers.

Analysing benefit incidence

Calculating the total benefits from using health services for each quintile is relatively straightforward after compiling all the information outlined above, and simply involves multiplying utilization rates by unit costs for each type of health service. An important step in assessing the accuracy of the calculations is to compare the sum of benefits of using health services across all households with the actual total expenditure for each category of facility. Given that a range of different sources of data may be used for estimating utilization rates and unit costs, it is critical to ensure that the total benefits calculated through using the above methods equal actual expenditure reported by relevant authorities (see Box 1).

If one is undertaking a 'traditional' BIA of the distribution of public subsidies, the remaining step is to deduct out-of-pocket payments made to the public facility for each type of service. This is again dependent on such information being available within the household survey. Although one could deduct total user fee revenue from total expenditure when doing the unit cost calculations (i.e. to obtain net unit cost to be used to estimate net subsidy per visit or per patient day rather than a total unit cost), this will not take into account that individuals in different socio-economic groups may pay different amounts of fees and so receive different government subsidies (O'Donnell *et al.* 2008; Wagstaff 2010) or even when care is free for a certain group of people, for instance the poor or young children.

There are two main ways in which benefit incidence data can be presented; either as a simple percentage share of total benefits accruing to each quintile or by means of concentration curves and indices. Due to space constraints, we do not present methods for calculating concentration indices and curves, but refer readers to O'Donnell *et al.* (2008) for a detailed exposition of these methods.

The share of benefits across quintiles is a useful way of presenting the findings to policymakers; it conveys inequalities in benefits between socio-economic groups in a simple and visually appealing way (see Figure 2 as an example). However, the drawback with this approach is that it may not provide a definitive answer on whether or not a particular service is 'pro-poor'. For example, Figure 2 shows the distribution of benefits from outpatient visits in public sector facilities in South Africa. This is a case where we cannot ascertain the pro-pooriness of the distribution. The poorest quintile (Q1) and Q4 and Q5, the richer quintiles, receive almost the same share of total benefits. In cases such as this, it is only when one calculates the concentration index that it can be stated that in fact the distribution of public outpatient benefits in South Africa is 'pro-rich', albeit only marginally (having a concentration index of 0.0046). It is important to present the standard

Box 1 Alternative approaches to estimating cost per service used

Option 1

If you do not have access to a reliable source of data on *actual* total health service utilization, such as a national HIS, divide total expenditure on each category of service (e.g. as derived from a NHA) by total utilization of that service derived from a national household survey to determine ‘unit costs’. This will automatically translate into the sum of benefits in each household (calculated as utilization rate derived solely from the household survey multiplied by unit cost as outlined here) totalling actual total expenditure as reported in an NHA or by a Ministry of Health.

Option 2

If you do have access to a reliable source of data on actual health service utilization:

- (1) adjust the estimates of utilization derived from the household survey to those derived from the HIS—for example, household surveys often under estimate overall utilization levels due to recall bias and need to be adjusted upwards to ensure that the sum of utilization across individual households in the survey equals actual utilization derived from the HIS;
- (2) calculate unit costs for each category of service using official data on total expenditure (e.g. from the Ministry of Health or NHA) and total utilization (from the HIS).

This will automatically translate into the sum of benefits in each household (calculated as utilization rate in the household survey after adjustment using HIS data multiplied by unit cost as outlined in the preceding section on ‘Collecting and analysing cost data’) totalling actual total expenditure as reported in NHA or by a Ministry of Health.

error and assess the statistical significance of the concentration index results, particularly where the concentration index is close to zero as in this case.

While the concentration index gives a picture of the extent of pro-poorness (or pro-richness) of the overall distribution of benefits, it is only a summary measure that does not tell us what is happening at every point in the distribution of the socio-economic variable. For instance, it is possible that the concentration index is positive, signifying a pro-rich distribution of benefits, while the resulting concentration curve may be pro-rich for certain socio-economic groups and pro-poor for others. In this regard, the use of concentration curves and dominance tests is very relevant. The dominance test is used to ascertain whether, statistically, the reported pro-rich distribution based on the concentration index can be said to be generally true across the entire distribution of the socio-economic variable. The concentration curves are also used to show visually the cumulative share of benefits accruing to a cumulative proportion of individuals. In Figure 3, based on our South

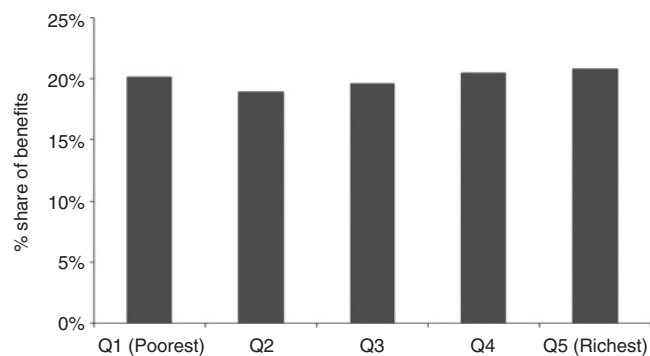


Figure 2 Percentage share of public outpatient benefits. *Source:* Analysis of SACBIA dataset

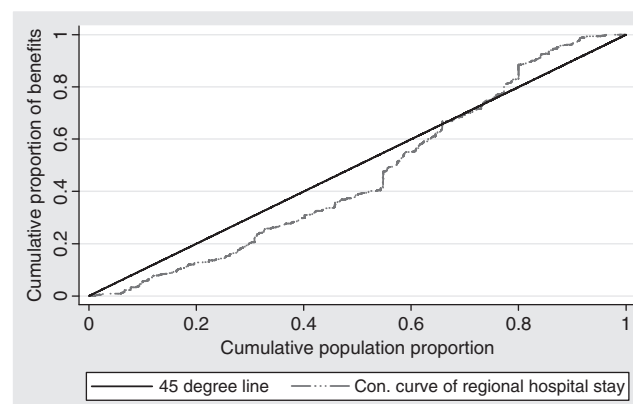


Figure 3 Concentration curve of benefits from regional hospital inpatient care. *Source:* Analysis of SACBIA dataset

African study, the distribution of regional hospital inpatient benefits is pro-rich in the lower quintiles but pro-poor in the upper quintiles. The combined effects give a positive concentration index (0.073)—a pro-rich distribution. The test of dominance using the multiple comparison approach (MCA) (Dardanoni and Forcina 1999) also showed that the concentration curve crosses the 45-degree line. The concentration curve and dominance test approaches are helpful in identifying cases where no unambiguous conclusions can be drawn in terms of there being no clear signs of a pro-rich or pro-poor distribution.

Figure 4 illustrates situations where unambiguous conclusions can be drawn. The distribution of visits to public clinics and community health centres (CHCs) is pro-poor (with concentration index of -0.116) throughout the entire distribution of socio-economic variables, while the distribution of public inpatient care for central and provincial hospitals is pro-rich (with concentration index 0.360). The dominance tests confirm the distribution patterns seen in the concentration curves.

Assessing whether distribution of benefits is appropriate

Most of the benefit incidence studies conducted to date have simply considered whether or not each quintile’s percentage

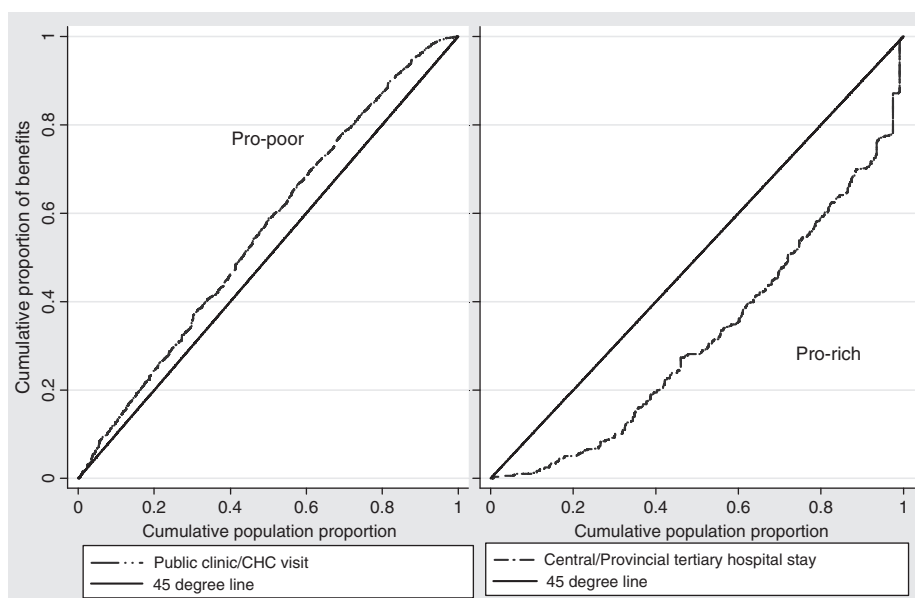


Figure 4 Concentration curves of benefits showing a pro-poor and a pro-rich distribution. *Source:* Analysis of SACBIA dataset

share of benefits is greater or less than their share of the population (i.e. 20% in each quintile). This assesses the extent of pro-poorness; or if each quintile's share of the benefits is greater than or less than their income share (i.e. assessing the inequality reducing effect). This implicitly assumes that the need to benefit from health care is the same across quintiles or, at best, that need is greater amongst the poorest but to what extent it is greater is not investigated. This assumption or lack of consideration of the distribution of need is inappropriate; as noted by Gwatkin *et al.* (2004, p.1279), 'health systems are consistently inequitable, providing more and higher quality services to the well-off, who need them less, than to the poor, who are unable to obtain them'. As most of the previous BIAs have focused on assessing the distribution of public subsidies, the emphasis was determining whether the lower income quintiles received more than a 20% share of benefits. Using this approach, the distribution of the benefits across quintiles shown in Figure 5 would be regarded as appropriate. However, as noted above, lower-income groups bear a relatively large share of the burden of ill-health. If the relative share of 'need' for health care across quintiles is as depicted in Figure 5, this would raise questions about whether or not the distribution of benefits from using health services is indeed appropriate.

There are a range of potential indicators of the relative need for health care, but the indicator(s) selected will depend on what data are available from household surveys, given that the indicator(s) of need must be linked with socio-economic status. In high-income countries, an indicator of self-assessed health status is most frequently used, either a 'crude' measure (e.g. using a question such as 'how would you describe your current health status' ranging from excellent to very poor) or a multi-dimensional composite index of health status based on questionnaires such as the EQ5D™ (EuroQol Group 5-Dimension Self-Report Questionnaire) and the SF-36™ [Short Form (36) Health Survey].

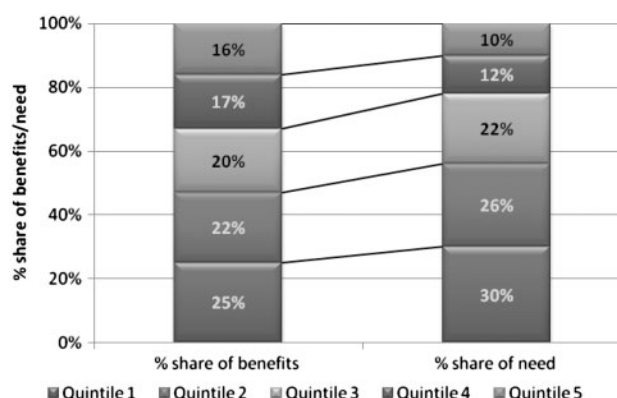


Figure 5 Comparison of the distribution of service benefits to need for care. *Source:* Hypothetical illustration

In low- and middle-income countries, household surveys (such as the LSMS) most often only include a question on self-reported illness (i.e. in the previous month, have you been ill or injured?). Numerous studies have indicated that self-reported illness can be a poor measure of health need (Sauerborn *et al.* 1996b; McIntyre *et al.* 1998; Makinen *et al.* 2000; McIntyre and Gilson 2000). Particularly in poor countries, there tends to be lower 'recognition' of illness by low-income groups than by higher income groups. This could be partially explained by the fact that the poor cannot 'afford' to be ill (either in terms of the opportunity cost of lost work time or due to poor health service access), while high-income groups are likely to have relatively good access to health services as well as sick leave benefits in their formal sector jobs (McIntyre *et al.* 1998). Sauerborn and others reached a similar conclusion, noting that one of the key ways in which the economic costs of illness can be avoided is 'by modifying illness perception (the phenomenon of ignoring disease)' (Sauerborn *et al.* 1996a).

For this reason, in our South African study, we included questions on self-assessed health status and on chronic illness (not least of all because AIDS accounts for the largest burden of ill-health in South Africa at present).

One can supplement this analysis by considering data from other household surveys that may have indicators of health need. For example, the DHS may include data that allow for calculation of infant mortality (IMR), maternal mortality (MMR), anthropometric measurement of nutritional status and other indicators of relevance to the need for health services. These can provide an indication of the distribution of death and illness across socio-economic groups. However, as they are drawn from a different household survey dataset from that used for the main BIA, they do not relate to the identical sample of individuals. Another potential concern is that while there is generally a far greater burden of IMR, MMR and malnutrition on lower-income groups, non-communicable diseases (NCD) may impose a greater burden on higher income groups in low-income countries, thus creating diverging perspectives on the overall burden of ill-health. It is helpful that the DHS is including data on the occurrence of NCD in some countries (Bradshaw and Steyn 2001), which can contribute to an overall assessment of burden of illness within a country. Nevertheless, drawing on data on burden of disease from a range of sources will enable a more detailed perspective on the relative distribution of the need for health care across socio-economic groups, against which the appropriateness of the distribution of benefits from using health services can be assessed.

Discussion

BIA can be a very useful tool in assessing health system performance. In the past, it has been used to assess how well public funds are targeted towards the poor. More recently, the basic methodology has been used to assess how well the overall health system is performing in meeting population needs through health service delivery. The latter approach is of particular relevance in the context of the growing emphasis on pursuing universal health systems. The concept of universality has at its core ensuring that there is financial protection against the cost of health services for all citizens as well as creating an environment within which all citizens are able to use health services when the need arises. For this reason, it is relevant to consider the incidence of benefits from using health services, irrespective of whether these services are publicly or privately provided, and compare this with the distribution of the need for health care.

The most important ingredient for successfully undertaking a BIA, whether the 'traditional' variety that focuses only on public subsidies or one that considers all health services, is appropriate household survey data. Ideally, the household survey should have the following characteristics:

- (1) Inclusion of information that will enable measurement of socio-economic status.
- (2) Capture of *total* health service utilization:
 - (i) Questions on the use of outpatient services should not be dependent on first reporting illness or injury

(preferably questions on use of services should be asked before asking any questions on illness or health status);

- (ii) Respondents should be requested to provide information on *all* health services used within the recall period, which should be a maximum of 1 month for outpatient services and 1 year for inpatient services (see O'Donnell *et al.* 2008, p.166, for details on the issue of recall periods). Thus, the number of visits to each service provider should be recorded as well as visits to more than one provider.
- (3) The categories of service providers used for utilization reporting should be as disaggregated as possible. In particular, they must distinguish between public and private providers. Within public providers, they should distinguish to the largest extent possible between different types of facility or levels of care. Similarly the main categories of private provider should be distinguished.
- (4) Relevant indicators of the need for health care should be included, such as self-assessed health status, existence of chronic illness, etc.

Unfortunately, there are very few household surveys that meet all of these requirements and it is simply not feasible to undertake regular national household surveys specifically designed for BIA studies. Researchers and policymakers should lobby their national statistical offices to revise their routine household surveys to incorporate these variables. The LSMS is probably the survey that can most easily be refined, as it already includes extensive socio-economic variables and includes questions on health service utilization. The key changes required are to ask about all health service utilization and not make this dependent on reported illness or injury and to include questions relating to the need for health care. The DHS is more difficult to adapt as the standard questionnaire currently includes no health service utilization questions and is focused primarily on the health of women and children.

BIA has not been widely used to date. It is potentially a powerful tool for evaluating the performance of a country's health system, and for monitoring changes over time, particularly in relation to whether or not benefits from the use of health services are distributed across socio-economic groups in line with each group's relative need for health care.

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Endnote

¹ In terms of recall periods, it is generally accepted that a maximum recall of 1 month should be used for outpatient services, and a maximum of 1 year for inpatient services, with some surveys using more limited recall periods of 2 weeks for outpatient care and 6 months for inpatient care.

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