A review of health resource tracking in developing countries

Timothy Powell-Jackson* and Anne Mills
Health Economics and Financing Programme, London School of Hygiene and Tropical Medicine, London, UK
*Corresponding author: Health Economics and Financing Programme, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. Email: Timothy.Powell-Jackson@lshtm.ac.uk

Abstract

Timely, reliable and complete information on financial resources in the health sector is critical for sound policy making and planning, particularly in developing countries where resources are both scarce and unpredictable. Health resource tracking has a long history and has seen renewed interest more recently as pressure has mounted to improve accountability for the attainment of the health MDGs. We review the methods used to track health resources and recent experiences of their application, with a view to identifying the major challenges that must be overcome if data availability and reliability are to improve.

At the country level, there have been important advances in the refinement of the National Health Accounts methodology, which is now regarded as the international standard. Significant efforts have also been put into the development of methods to track disease-specific expenditures. However, NHA as a framework can do little to address the underlying problem of weak government public expenditure management and information systems that provide much of the raw data. The experience of institutionalising NHA suggests progress has been uneven and there is a potential for stand-alone disease accounts to make the situation worse by undermining capacity and confusing technicians. Global level tracking of donor assistance to health relies to a large extent on the OECD's Creditor Reporting System. Despite improvements in its coverage and reliability, the demand for estimates of aid to control of specific diseases is resulting in multiple, uncoordinated data requests to donor agencies, placing additional workload

on the providers of information. The emergence of budget support aid modalities poses a methodological challenge to health resource tracking, as such support is difficult to attribute to any particular sector or health programme.

Attention should focus on improving underlying financial and information systems at the country level, which will facilitate more reliable and timely reporting of NHA estimates. Effective implementation of a framework to make donors more accountable to recipient countries and the international community will improve availability of financial data on their activities.

Keywords

Key Messages

- Health resource tracking in developing countries has seen substantial advancements over the years in the standardisation of methods, providing more reliable information to influence decision-makers and improve health system performance.
- Important gaps in information on the flow of resources to health remain, most of all in the coverage of reliable National Health Accounts estimates. The major challenges that exist relate to weak underlying systems and linkages, methodological limitations, implementation constraints and getting evidence into policy.
- Improvement in the functioning of public expenditure management systems of developing countries is the priority and will be influenced most by domestic pressure for greater accountability. Donors have a clear role to play in capacity building and providing recipient governments with timely data on their aid activities.

I. Introduction

Timely, reliable and complete information on financial resources in the health sector is critical for sound policy making and planning. The need for such data exists the world

over, but no more so than in developing countries. When available resources are substantially less than needs, allocation decisions are all the more important and in many aid dependent countries planning is further complicated by volatile aid flows, and subsequent uncertainty over available health resources (Bulir and Hamann 2001). Yet it is in these countries where the greatest gaps in data on health resources exist. Without accurate information on the size and distribution of available funds, resources are unlikely to be allocated in a way that reflects a country's priority health needs, hampering efforts to deliver health services that improve the population's health status and standard of living.

Efforts to collect and analyse data on the flow of health funds, referred to now as health resource tracking, began in the 1950s with some national surveys in developed countries focusing on some sources of finance only (ILO 1959, ISSA 1961). The first systematic and comprehensive survey was done by Abel Smith in 6 countries, including Sri Lanka and Chile (Abel-Smith 1963). Based on the encouraging results of this first survey, another larger study was commissioned of 29 countries, 21 of them developing countries (Abel-Smith 1967).

This study stimulated further experimentation and methodological development, with developed countries initially moving ahead faster than developing countries (Griffiths and Mills 1983). However during the 1970s there was growing experimentation with health financing and expenditure surveys in developing countries (Kam, et al. 1977, WHO 1978), and the development of a number of manuals (Griffiths and Mills 1982, Mach and Abel-Smith 1983, Roberston, et al. 1979). Since then, health accounting at the country level has become more standardised in the form of the National Health Accounts (NHA) methodology, and the value of such data more widely appreciated.

Most recently there has been renewed interest in health resource tracking at the global level, where a preoccupation of advocates has been to use such information to campaign for increased international aid and to hold the donor community more accountable to their commitments (Levine 2006). The emergence of the Millennium Development Goals

(MDG) as the focal point of international development has prompted some, quite rightly, to ask how much money is required to reach these targets and how much is currently spent. In addition, donors are demanding more reliable data on health spending in recipient countries to compare against programme performance, and there is a growing consensus that the health MDGs will not be achieved unless more resources are mobilised and better spent. This requires a robust evidence base.

Aside from the interest of donors, recommendations from the High Level Forum for the Health MDGs indicate that developing countries are keen to improve data on financial resources in health and wish to see this issue given greater prominence (HLF 2004). Reflecting collective concerns over the current state of health resource tracking, an independent think tank, the Center for Global Development (CGD), has set up a working group of experts to identify ways of improving data on financial flows in the health sector in developing countries.

The purpose of this paper is to examine how health resources can be tracked to fulfil the information needs of those who make or influence policy, whether they be government officials in developing countries, technicians (including researchers), donors, advocacy groups or politicians (Levine and Blumer 2004). First, we describe how data on health resources are used. Second, based on the findings of a literature review, we give an overview of the various approaches to health resource tracking and then examine the major challenges that exist. We conclude with a discussion on ways in which data collection efforts can be improved and better integrated so as to make health resource tracking more effective and responsive to demands.

2. Search strategy

We searched PubMed for literature published from January 1966 to May 2006. The search terms used were: (health) AND (donor support OR international aid OR international spending OR financial flows OR health expenditure* OR health account* OR financial account*) AND (Africa OR Asia OR Latin OR Caribbean OR Soviet OR Eastern Europe OR OECD). The searches were limited to English language literature

dealing with human subjects. We also performed internet searches for grey literature, reviewing the websites of the following organisations working in health resource tracking: WHO, OECD, PAHO, Center for Global Development, Partnerships for Health Reform, Overseas Development Institute, World Bank, International Monetary Fund and DFID Health Systems Resource Centre.

Our search produced 1118 publications of potential relevance in PubMed. If the titles or abstracts of these articles made any reference to *methods* used in tracking health resources, they were deemed relevant. Reference lists of the identified references were reviewed for additional publications. We identified and reviewed 13 publications of relevance.

3. Purpose of health resource tracking

The goal of health resource tracking is to inform the decision-making process and thereby enhance health system performance. It provides the evidence base for improved policy development, planning, and implementation. More specifically, information on the flow of funds is used for resource allocation, resource mobilisation, stewardship, understanding distributional fairness and the development of financing strategies (WHO 2003, Levine and Blumer 2004, PHR*plus* 2004).

A central concern of policymakers is how to allocate scarce health resources. To do so effectively requires an understanding of the allocation of funds along different dimensions of the health system – health services, provider levels, interventions and disease categories – and to what extent these reflect health priorities and / or government policies in a country. It can also measure the actual success of policies to shift resource priorities (WHO 2003). NHA data in South Africa, for example, has contributed to the debate on the geographical allocation of government health resources and means of redressing related inequities (personal communication, Lucy Gilson) (De, et al. 2003). The issue of what sort of breakdowns of health financing data are most informative lies at the heart of health resource tracking.

Health resource tracking is used to quantify the adequacy of funds in terms of the gap between what is currently being spent and what is required. Such information can be used as a powerful advocacy tool to mobilise additional health resources, whether it be in the annual budget discussions between a Ministry of Health and Ministry of Finance or by an advocacy group pressuring the international donor community. Knowing where funds are mobilised from can also inform strategies to raise additional health resources. Data on donor disbursements to maternal, newborn and child health, for example, were recently used to re-invigorate commitments to MDGs 4 and 5.

Effective stewardship of a health system requires an understanding of how health resources are managed. This can help to improve coordination of actors and avoid duplication of effort to ensure the efficient use of scarce resources. This issue is particularly pertinent in the context of development aid, where there are often numerous external donors and NGOs working in health (Levine and Blumer 2004). If a government sees there is poor coordination in the allocation of health resources, it may wish to use mechanisms such as a Sector-Wide Approach (SWAp) to align support more closely to its stated policy priorities. NHA data from Rwanda has shown that a significant proportion of funds are spent off-budget undermining government stewardship of the health sector. As expected, expenditure on administration is considerable, and there is a misallocation of resources towards HIV/AIDS at the expense of greater burdens of disease such as malaria and childhood illnesses (Foster and Killick 2006).

Assessing who benefits from expenditure on health care is important for understanding whether the allocation of funds results in benefits reaching their intended target group (WHO 2003). While allocation decisions may be well intentioned, the beneficiaries, for implementation reasons, may not always be those intended. The application of benefit incidence analysis examines who are the beneficiaries of health care expenditure between various client and population groups (Wagstaff and van Doorslaer 1993), drawing on not only expenditure data but also data on health service utilisation and target groups. Groups may be defined in terms of geographical location, age, gender, or ethnicity, but typically a benefit incidence analysis uses a measure of living standards, such as income

or wealth (Pearson 2002). Although examining the distribution of health expenditure across socio-economic groups is still relatively uncommon in developing countries, there are examples of its use, such as the cross country comparison of equity in public health spending in Asia (O'Donnell, et al. 2005).

Last, analysis of health expenditure data is a critical input into the development of financing strategies. Knowing who finances health services, how they pay for it, and the relative size of the financial burden provides insight into the fairness of health financing, and the extent to which risk pooling and financing mechanisms protect against catastrophic health payments and their impoverishing effects (Wagstaff and van Doorslaer 1993, WHO 2003). The fairness of financing contribution has been identified as a key dimension of health system performance (WHO 2000). In developing countries, where evidence suggests out-of-pocket payments exacerbate poverty (van Doorslaer, et al. 2006), the development of financing strategies that protect the poor is a pressing need. More broadly, the balance between public, private and external financing in a health system can have implications for sustainability, and again equity.

The most common types of financial data gathered by health resource tracking systems include budgets, commitments, disbursements and expenditures. Budget data show the estimated resources available and the amount planned to be spent, while commitments measure the amount of funds to be drawn down over time, indicating a firm decision or promise to spend money (Eiseman and Fossum 2005). Although disbursements and expenditures are both retrospective types of data, in the context of international aid, a distinction is made between the two. Disbursement data represent the placement of financial resources at the disposal of entities within a recipient country during a calendar year (OECD 2002), and expenditures measure the value of goods and services consumed within a country during a calendar year[1].

[1] Depending on the source of data, in some instances such as the case of drugs and supplies, expenditures may not measure the value of consumption since the cost is registered when purchased not when consumed.

Expenditure data provide the most accurate assessment of the financial status of a health system, and reflect the actual financial cost of providing services (PHR*plus* 2004). They are also the most difficult and sensitive type of financial data to gather. Audited data are typically available after 6 to 12 months from the end of the fiscal year. Though funds may be budgeted or committed, it is by no means guaranteed that they translate into expenditures owing to delays in disbursement and outright cancellations. In other words, budget data are not necessarily an accurate reflection of how resources are used, particularly in countries where capacity to plan and implement is weak.

4. Approaches to health resource tracking

When reviewing the various methods employed for health resource tracking, we followed Eisman and Fossum (2005) in making the distinction between those that collect data on global aid flows to developing countries and those that track domestic resources within developing countries, for these two sets of information are used at different levels of decision-making.

Country level

At the country level, the internationally accepted methodology for analysing the flow of health resources is the system of National Health Accounts (WHO 2003), founded on the OECD System of Health Accounts (OECD 2000). The methods were first pioneered in OECD countries (Schieber and Poullier 1986), and later applied to developing countries (Berman 1997). They represent the culmination of over 15 years of experience in health accounting, establishing a systematic, consistent, and comprehensive approach to measuring health expenditure within a country (Poullier, et al. 2003). NHA analyses the flow of health resources through the entire health system from the source of financing to the end purchase of health care goods and services. To date, NHAs have been conducted at least once in almost 70 countries (PHR*plus* 2004), of which approximately 30 are developing countries (WHO 2006b).
(www.who.int/nha/docs/country/en/index.html).

NHA is essentially a framework to classify expenditures within a health system. It links the flow of funds within a matrix between two dimensions. NHA, at the most basic level, tracks funding flows between four possible dimensions: financing sources; financing agents; health providers; and functions. The functions refer to categories of 'types of goods and services produced by health care providers and by institutions and actors engaged in related activities to health care' (WHO 2003). NHA relies on data collected from both primary and secondary sources including government ministries, social security agencies, households, private companies, insurers, donor organisations, NGOs, health care providers and pharmaceutical retailers. The matrix design of NHA tables means that for any single entry, there are likely to be at least two sources of data which can be cross-checked to generate the most reliable expenditure estimate available. Ideally, all data should be available 'off the shelf.' However, in practice, surveys and interview schedules are required to fill data gaps.

WHO publish annually a basic set of 16 policy-relevant NHA indicators for all member states, in the first instance drawing on national health accounts reports or OECD health data and, if unavailable, public expenditure reports, budgetary reports, other government documents, household surveys and other sources (WHO 2006a). This dataset represents the most complete and detailed set of country level data on health expenditures and is supplemented by disaggregated data available online (WHO 2006b). The Pan-American Health Organisation (PAHO 2005), OECD (OECD 2004) and World Bank (World Bank 2006) also maintain separate databases on health accounts. However, these databases are not consistent in their reporting of statistics.

The NHA framework and classifications are sufficiently flexible to track disease and population-group specific health expenditures. These sub-accounts, as the name suggests, are undertaken as part of an overall NHA in which total health expenditures are allocated across priority disease groupings based on International Classification of Diseases definitions. They capture specific expenditures related to the disease or population group in question as well as integrated health funds, prorated on the basis of utilisation and cost information. Work has been undertaken to develop and standardise methods in the

measurement of HIV/AIDS (De, et al. 2004), malaria, reproductive health and child health expenditures (Expert Group on Child Health Accounts 2005) using the NHA framework.

Independently, the Regional AIDS Initiative for Latin America and the Caribbean (SIDALAC) has developed National HIV/AIDS Accounts, which has been used across Central and Latin America (Izazola-Licea, et al. 2002). The classifications used, despite not adhering to the precise dimensions of the NHA framework, closely match those of the HIV/AIDS sub-accounts at the level of functions. The major difference lies in the approach; National HIV/AIDS Accounts are conducted as stand-alone exercises.

Financial data on immunisation activities are collected for approximately 40 developing countries as a requirement in the Financial Sustainability Plans submitted to GAVI (WHO 2006c). The database includes information on both past expenditures and future resource requirements. It is possible to disaggregate expenditures by source of financing (closest to the end use) and type of input. The methods serve to track immunisation specific funds only, and there is no attempt to include expenditures on shared inputs (WHO 2006d).

Since in-country health resource tracking methods rely on public expenditure management (PEM) systems for data on government expenditures, it is worth considering how these have evolved in recent years in developing countries. In parallel with the development of Poverty Reduction Strategy Papers (PRSP) in the Highly Indebted Poor Countries (HIPC), many governments reformed their PEM systems towards performance based budgeting and the establishment of medium term expenditure frameworks (MTEF). Performance budgeting is the planning of public expenditures towards the achievement of specified results that are linked explicitly to policy objectives. It evolved out of the planning, programming, budgeting system (PPBS), first developed in the US during World War II, and adopted most ardently by the US Defence Department to improve efficiency and address the disconnect between budgeting and planning (Rose 2005).

Performance budgeting has now been adopted in many OECD countries, although the specific focus of these systems differs widely across national governments (Rose 2005).

The adoption of MTEFs in many developing countries does not imply *per se* that there has been a simultaneous upgrading of financial accounting and auditing procedures to provide more reliable expenditure data. Indeed mature performance budgeting systems coexist with poor financial accountability, largely because most of the progress to date has been presentational rather than operational (Roberts 2003). It does mean, however, that government health expenditures are linked to clearly defined outputs or activities and can therefore be categorised more easily into the functional classifications of NHA.

In the absence of robust PEM systems, a number of developing countries have undertaken public expenditure tracking surveys (PETS). In contrast to the above health resource tracking methods, PETS seek to analyse delays in disbursements of public funds and the extent of misappropriations as funds flow from the time of release to the purchase of final goods and services (Dehn, et al. 2003).

Global level

The definitive source of data on aid flows to developing countries is the Creditor Reporting System (CRS) database, maintained and administered by the Development Assistance Committee (DAC) of the OECD. Although originally conceived to supply data on capital flows and indebtedness, it has evolved over time to give geographical and sectoral breakdowns of aid for 186 recipient countries (OECD 2002). It is accessible online and available to the public (OECD 2006a).

DAC members (22 high income donor countries and the European Commission) and a growing number of multilateral organisations self-report to the CRS on individual project transactions, supplying financial and descriptive data on their aid activities, which allows analysis of commitments and disbursements by year, donor, recipient country, type of flows (ie. grant or loan), and purpose of aid. Donors are guided in their reporting by a set of directives and definitions that in essence provide the methodological foundation for

tracking official aid flows (OECD 2001a, OECD 2002). The definition of health resources, however, differs slightly from total health expenditure, the statistic most commonly reported in NHA, by including medical education, training and research[2].

The DAC database, complementary to the CRS, provides aggregate estimates of aid flows and is useful in verifying the completeness of the CRS. In the 1990s, the coverage of ODA commitments reported to the CRS as a proportion of commitments reported to the DAC was approximately 75 to 80 percent (OECD 2001b). The coverage has improved markedly to 92 percent for the database as a whole and 100 percent for the health sector in 2002 (OECD 2006b, OECD 2006c).

The DAC and CRS have been used to analyse global trends in international aid to the health sector (Michaud and Murray 1994). Despite being designed originally to monitor broad sectoral flows, data in the CRS have also been exploited extensively in a plethora of studies tracking global levels of Official Development Assistance (ODA) to specific health programmes – including population activities[3] (OECD 2004, Ethleston, et al. 2004, MacKellar 2005, Reuser, et al. 2004, UNAIDS 2005); malaria (Narasimhan and Attaran 2003, Waddington, et al. 2005); TB (WHO 2005); and maternal, newborn and child health (Powell-Jackson, et al. 2006).

Many of the studies have sought to supplement and validate CRS data with direct requests for information from bilateral and multilateral organisations, as well as other organisations such as foundations, NGOs and private companies, whose private aid transactions are not captured by the CRS. The Resource Flows database, maintained by the Netherlands Interdisciplinary Demographic Institute (NIDI) on behalf of UNFPA and UNAIDS, and studies on tuberculosis and health research, go one step further, tracking also developing countries' domestic expenditures to population activities (UNFPA 2004,

[2] The NHA definition of national health expenditure does include research and training as health related expenses (HCR.2 and HCR.3)

[3] Population activities are inclusive of family planning, basic reproductive health services, basic research and policy development, and HIV/AIDS

van Dalen and Reuser 2005), tuberculosis (WHO 2005) and health research (Global Forum for Health Research 2004) respectively.

5. Challenges

Currently, there are important gaps in information on the flow of resources to health. Application of NHA methods in OECD countries is widespread (OECD 2004) but at present remains limited in developing countries. Few developing countries report reliable NHA estimates on a regular and frequent basis and studies, on the whole, remain one-off exercises (WHO 2006b). Disbursement data in the CRS are incomplete, and the extent of reporting varies considerably between donors. The World Bank, for example, reports commitments only, while UN agencies report expenditures only. Moreover, with the focus of the CRS on ODA, there exists no systematic collection of data on external flows of private health funds to developing countries from foundations, individuals and companies – a source of growing importance.

Ensuring timely, reliable and complete information on health resources faces a number of challenges and these are discussed along the following themes: weak underlying systems and linkages; methodological limitations; implementation constraints; and getting evidence into policy.

Weak underlying systems and linkages

Routine reporting of financial data must rely on underlying systems. The majority of information required for NHA *should* be available from secondary sources (PHR*plus* 2004). An important concern relates to the reliability of data that NHA estimates are founded upon. PEM systems in low-income countries are often weak in terms of their capacity to account accurately for transactions, particularly at decentralised levels, as are data on health service utilisation, which are used to distribute health expenditures between different functions. A joint review by the International Monetary Fund and World Bank of the PEM systems of HIPC countries, for example, found that 16 out of the 25 study countries required substantial upgrading and almost all countries had inadequate auditing procedures (IMF and IDA 2001).

Private health expenditures have, in the past, been overlooked (Chawla, et al. 1998), and remain difficult to obtain for practical reasons. Health management information systems occasionally record user fee revenues within the public health system, but rarely cover private health institutions and private pharmacies. Health spending questions have been incorporated into household surveys, such as the Living Standards Measurement Surveys, in some countries (Hotchkiss, et al. 1998). These can provide valuable and reliable information on out-of-pocket health expenditures, but on an infrequent basis only. Only basic information is obtainable from such surveys, due to the multi-purpose nature of household surveys and the unreliability of responses to complex expenditure questions given the recall period required from respondents.

The data problem is further compounded by the poor record of donor agencies in providing government authorities with accurate expenditure and commitment statistics on a routine basis (Foster and Killick 2006). In response, some countries have implemented external aid databases so as to consolidate all data collection activities from donors and NGOs into a routine, predictable process. These databases are designed to improve planning and to monitor the activities of external development partners in an effort to make these organisations more accountable to stakeholders in the recipient country. They are principally for the purposes of the Ministry of Finance, and therefore may not provide the level of detail required by a Ministry of Health for comprehensive sector level planning. The absence of reliable underlying routine systems has implications for the implementation of health resource tracking efforts, as discussed below.

Global level tracking of development aid relies on the DAC system and CRS, which in turn draw their data from the existing financial systems of donor organisations. Here, the challenge is not so much related to weak systems but rather to standardising into one common format the information coming from the data management systems of over two dozen donors, who each use their own classifications. Linking their system to the CRS is a challenge for some donor organisations.

Methodological limitations

The standardisation of the NHA methodology for country level health resource tracking is no small achievement. There have been a variety of health accounting approaches developed over the past 15 years (PAHO 2003) and it required a concerted effort, based on the input of a wide group of experts and practitioners with experience in applying the various methods, to reach a consensus on a standard methodology. Similarly, the CRS represents the establishment of a standard in the tracking of ODA to developing countries. There remains a limitation of the CRS in the manner projects are assigned to sectors on an 'all or nothing' basis. A project that supports more than one sector is categorised according to the sector receiving the majority of funds and the other sectors are deemed to receive nothing (Attaran and Sachs 2001, MacKellar 2005).

Demand for expenditure data on specific diseases has increased in recent years and in response, methods have been developed to track these resource flows. Any disease expenditure tracking study, whether at the country level or on a global scale, will face the methodological challenge of apportioning funds channelled through integrated health services to the disease of interest. Accounting systems can categorise information in two ways – by type of resource (e.g. salaries, equipment) or management cost centre (e.g. health facility, vertical health programme). Adding a third level, such as disease categories, is not usually possible. One cannot expect health workers, for example, to fill out time sheets every day stating how much time they spend with HIV/AIDS patients. It is only practical to apportion funds to a disease in the analysis stage, using detailed health service utilisation and cost data, which may not always be available (Janowitz and Thompson 2001).

At the country level, disease accounts are undertaken either as part of a broader NHA exercise or as a stand-alone study. If disease accounts are conducted outside of a general, overarching framework, there is the potential for the sum of the disease expenditures to exceed total national health expenditure. Moreover, it is questionable how reliably, if at all, stand-alone disease accounts can attribute integrated health funds to the disease in question without an appreciation of the overall health expenditure envelope.

The inability of many donors to report on expenditures to a specific disease is illustrative of the inherent tension between the data needs of policymakers and the practicalities of tracking resources (Ethleston, et al. 2004). For donors who use the majority of their budget to support health systems and the delivery of integrated health services, it would not be rational to structure their accounting system around disease categories or interventions. Poor transparency may also be to blame and, as is clear from a recent debate concerning the World Bank's malaria programme, difficulties in reporting disease-specific spending might be explained by either (Attaran, et al. 2006, Sarbib, et al. 2006). A further issue is that the information demanded from donors is often not in discrete categories. The tracking of maternal, newborn and child health, for instance, cuts across diseases and must use methods to apportion not only integrated health funds but also disease expenditures (Powell-Jackson, et al. 2006). The design of any accounting system is founded upon the classification of expenditures into discrete categories and the problem of disentangling expenditures on overlapping health programmes must be resolved in the analysis stage.

A final methodological challenge in health resource tracking relates to the emergence of budgetary support and pooling mechanisms, used increasingly by some donors to disburse aid. As these funds are disbursed through government, PEM systems have to be relied on for accounting purposes. Moreover, general budget support funds are completely fungible; hence it is difficult to attribute them to a specific sector without a complex time trend analysis of all sources of government revenue and expenditure by sector. Crude methods have been used to distribute budget support or pooled funds to specific diseases and demographic groups, but they provide indicative estimates only (Bruijn and Horstman 2005, Powell-Jackson, et al. 2006).

This is not to argue that donors should not disburse aid through such mechanisms. The difficulties faced by health resource tracking are simply a reality of doing business this way. Indeed, the channelling of money through government systems should provide

donors with a stronger incentive to help improve government capacity to plan and account for public funds.

Implementation constraints

Missing data from secondary sources is a major barrier to implementation of NHA. When underlying systems are non-existent or the data weak, surveys must be undertaken to fill the void. Not only are surveys of government ministries, donors and private entities time-consuming and costly, they do not contribute directly to system development. The problem is often government-wide, not soluble within a single sector, and as long as these data gaps continue to exist, NHAs will rely on questionnaires to collect information that should be available routinely, at the expense of timeliness and policy relevance.

Institutionalisation is an important criterion that has been applied to NHA. Certainly, the establishment of an "organisational home and technical capacity to develop ongoing expenditure estimates" is critical for time series analyses (WHO 2003). Frequency in the reporting of NHA estimates suggests institutionalisation across countries has been uneven. Successful institutionalisation does not necessarily preclude external support, but given the unpredictability of donor funding and shifting priorities, the long run viability of NHA and regular reporting of estimates is likely to require governments eventually to bear the cost. An important consideration for the institutionalisation of NHA is who is best positioned within the country to undertake the work. Such a decision should be based on who has access to data, where capacity lies and who is most likely to influence the decision-making process at the top of government. Experience suggests central government is the most effective 'home' for the NHA team (WHO 2003).

The DAC and CRS databases are long established systems. Coverage of commitments from the OECD member countries has improved, and other donor countries and multilateral agencies have integrated their reporting into the system. Nevertheless, a number of donors still fail to report complete information, which has led some to question the transparency of these organisations (Narasimhan and Attaran 2003). The slow pace at which coverage of the OECD's CRS system has increased is perhaps

testament to the reluctance of donors to disclose information or to give disclosure priority, in combination with the absence of a robust system to ensure compliance with data requirements.

Despite the apparent wide acceptance of the NHA methodology and CRS database, disease expenditure tracking studies that use parallel means of data collection and conflicting methods for the attainment of short-term objectives are still pursued and can risk compromising these systems. The 'stand-alone' approach, such as that proposed to measure HIV/AIDS expenditures by UNAIDS, has the potential to confuse and undermine capacity already built in NHA by promoting conflicting classification systems and methods (Dmytraczenko, et al. 2006). Therefore, for both methodological and implementation reasons, NHA should always be the basis for disease-specific studies. The demand for disease-specific estimates at the global level has manifested itself in multiple, uncoordinated data requests to donor agencies, placing additional workload on the providers of information. Not only has this strategy proved largely unsuccessful in providing additional data, for example in the collection of malaria aid expenditures (Narasimhan and Attaran 2003), it threatens to undermine more established and official systems of data collection.

Getting evidence into policy

Even when quality data on health resources are available, there is no guarantee that they will be used to inform policymaking. The challenge of getting evidence into policy is not new, nor is it limited to developing countries or health resource tracking. Nonetheless, it remains an important issue in this context. Evidence-based policymaking is an inherently complex and political process (Sutcliffe and Court 2005) and has been given limited attention in the resource tracking literature. One exception is a review of 21 countries, which analyses how NHA has impacted upon health policy and provides policy stories as illustrative examples from a broad range of developing countries (De, et al. 2003). In total 19 countries reported at least one instance of NHA findings being used to inform policy, suggesting governments do place value on NHA findings. There is a need for further qualitative research into the policy uses of health resource tracking both to

strengthen the case for the development of these systems and to focus attention on how to increase evidence-based policymaking.

6. Discussion

Health resource tracking has seen encouraging advances in recent years in the standardisation of methods and availability of health expenditure data. However, there remains a conflict between satisfying short-term data needs and building systems and capacity in the long-term.

The working group convened by CGD (Global Health Resource Tracking Working Group 2005) identified a core set of basic principles to guide the international donor community in their support for health resource tracking. They include: responding first and foremost to the needs of in-country policymakers; coordinating and aligning their support; utilising modern information management systems; and thinking long-term. While these ground rules and the recommendations which they underpin address closely the main issues in health resource tracking, it is unclear to what extent donors have an effective role to play in improving country level information systems upon which NHA should depend. Experience suggests donor-driven reforms in public expenditure management and conditionality more broadly have met with few successes (Foster and Killick 2006). Rather, the role of donors should be limited to technical capacity building. Genuine government accountability is generated when there is political pressure from within, from service beneficiaries and users on service providers, supported by an independent audit office, effective parliamentary scrutiny and civil society (Roberts 2003).

Donors have a clear role to play in providing recipient governments with timely data on their aid activities, and at the global level for the tracking of aid flows by sector and sub-sector. Central to this is again the issue of accountability. Bilateral donor organisations are accountable to their domestic electorate and lack the incentive to provide recipient countries or the international community with detailed information on their aid activities and commitments. Unless compelled to do so, donors will typically avoid providing

information that might be used to identify poor performance or that impose additional burdens on stretched administrations. The most promising first step forward in this regard is implementation of the principles laid out in the Paris Declaration on Aid Effectiveness (OECD 2005).

There is a growing need to standardise methods for tracking donor aid to specific diseases to ensure that estimates are consistent, particularly in the apportionment of integrated health funds. At the same time, it should be recognised that these techniques provide indicative estimates only, which will become increasingly problematic as more donors move towards budget support funding. Moreover, there is a danger that advocacy efforts, for which the data are typically used, place pressure on donors to channel (and account for) funds in a vertical manner using separate parallel systems, when there is a growing consensus that health system strengthening and integrated funding flows are what is required (Travis, et al. 2004).

Health resource tracking and public expenditure management may not be the most emotive issues on the development agenda, but they are key in providing the robust information base needed to develop equitable financing policies and ensure health resources are effectively mobilised and allocated.

References

Abel-Smith B. 1963. *Paying for health services: a study of the costs and sources of finance in six countries* Public Health Papers, 17. Geneva: World Health Organisation.

Abel-Smith B. 1967. *An international study of health expenditures and its relevance for health*. Public Health Papers, 32. Geneva: World Health Organisation.

Attaran A, Barnes KI, Bate R, et al. 2006. The World Bank: false financial and statistical accounts and medical malpractice in malaria treatment. *Lancet* **368**: 247-52.

Attaran A and Sachs J. 2001. Defining and refining international donor support for combating the AIDS pandemic. *Lancet* **357**: 57-61.

Berman PA. 1997. National health accounts in developing countries: appropriate methods and recent applications. *Health Econ* **6**: 11-30.

Bruijn B and Horstman R. 2005. *Population and AIDS activities in health sector-wide approaches: a method for estimating category expenses in pooled funds*. The Hague: Netherlands Interdisciplinary Demographic Institute.

Bulir A and Hamann A. 2001. *How volatile and unpredictable are aid flows, and what are the policy implications?* IMF Working Paper, 01/167. Washington DC: International Monetary Fund.

Chawla M, Berman P and Kawiorska D. 1998. Financing health services in Poland: new evidence on private expenditures. *Health Econ* **7**: 337-46.

De S, Dmytraczenko T, Brinkerhoff D and Tien M. 2003. *Has improved availability of health expenditure data contributed to evidence-based policy making? Country experiences with National Health Accounts*. Technical Report, No. 022. Bethesda, MD: The Partners for Health Reform*plus* Project, Abt Associates Inc.

De S, Dmytraczenko T, Chanfreau C, Tien M and Kombe G. 2004. *Methodological guidelines for conducting a National Health Accounts Subanalysis for HIV/AIDS*. Bethesda: The Partners for Health Reformplus Project, Abt Associates.

Dehn J, Reinikka R and Svensson J. 2003. Survey tools for assessing performance in service delivery. In: F. Bourguignon and L. Pereira da Silva (ed). *Evaluating the poverty and distributional impact of economic policies*. Oxford: Oxford University Press and the World Bank. Forthcoming,

Dmytraczenko T, Fernanda Merino M, Chanfreau C and Burgert C. 2006. *Comments on the National AIDS Spending Assessment*. Bethesda, MD: The Partners for Health Reformplus Project, Abt Associates Inc.

Eiseman E and Fossum D. 2005. *The challenges of creating a global health resource tracking system*. Arlington: RAND Corporation.

Ethleston S, Bechtel A, Chaya N, Kantner A and Gibb Vogel C. 2004. Progress and promises: trends in international assistance for reproductive health and population. Washington DC: Population Action International.

Expert Group on Child Health Accounts. 2005. *Minutes of conference call on boundaries of child health accounts*.

Foster M and Killick T. 2006. *What would doubling aid do for macroeconomic management in Africa?* Working Paper, No. 264. London: Overseas Development Institute.

Global Forum for Health Research. 2004. Monitoring financial flows for health research. Global Forum for Health Research.

Global Health Resource Tracking Working Group. 2005. *Following the Money in Global Health: Recommendations for Global Health Resource Tracking*. Washington DC: Center for Global Development.

Griffiths A and Mills M. 1982. Money for health: a manual for surveys in developing countries. Geneva: Sandoz Institute for Health and Socio-Economics Studies and the Ministry of Health of the Republic of Botswana.

Griffiths A and Mills M. 1983. Health sector financing and expenditure surveys. In: K. Lee and A. Mills (ed). *The economics of health in developing countries*. Oxford: Oxford University Press,

HLF. 2004. *High level forum on the health MDGs: summary of discussions and agreed action points*. Geneva: World Health Organisation and World Bank.

Hotchkiss DR, Rous JJ, Karmacharya K and Sangraula P. 1998. Household health expenditures in Nepal: implications for health care financing reform. *Health Policy Plan* **13**: 371-83.

ILO. 1959. *The cost of medical care*. Geneva: International Labour Office.

IMF and IDA. 2001. *Tracking of poverty-reducing public spending in heavily indebted poor countries*. Washington DC: International Monetary Fund and International Development Association.

ISSA. 1961. *Volume and cost of sickness benefits in kind and cash*. Geneva: International Social Security Association.

Izazola-Licea JA, Avila-Figueroa C, Aran D, et al. 2002. Country response to HIV/AIDS: national health accounts on HIV/AIDS in Brazil, Guatemala, Honduras, Mexico and Uruguay. *Aids* **16 Suppl 3**: S66-75.

Janowitz B and Thompson A. 2001. Why it is difficult to determine resource requirements for family planning. *J Biosoc Sci* **33**: 551-67.

Kam PM, Malotle MP and Raditladi MD. 1977. A country case study: financing of health services in Botswana. Gaborone: Ministry of Health of the Republic of Botswana.

Levine R. 2006. *Following the money in global health*. Global Health Link, Washington DC: Global Health Council.

Levine R and Blumer K. 2004. *Gaps and missing links: what do we know about resource flows in global health?* Global Forum for Health Research, Forum 8, Mexico City: Center for Global Development.

Mach E and Abel-Smith B. 1983. Planning the finances of the health sector: a manual for developing countries. Geneva: World Health Organisation.

MacKellar L. 2005. Priorities in global assistance for health, AIDS and population. *Population and Development Review* **31**: p. 293-312.

Michaud C and Murray CJ. 1994. External assistance to the health sector in developing countries: a detailed analysis, 1972-90. *Bull World Health Organ* **72**: 639-51.

Narasimhan V and Attaran A. 2003. Roll back malaria? The scarcity of international aid for malaria control. *Malar J* **2**: 8.

O'Donnell O, van Doorslaer E, Rannan-Eliya RP and Somanathan A. 2005. *Who benefits from public health spending in Asia?* Equitap Working Papers, Thessaloniki: Equitap.

OECD. 2000. A sytem of health accounts. Paris: Organisation for Economic Co-operation and Development.

OECD. 2001a. *Is it ODA?* Paris: Development Assistance Committee, Organisation for Economic Co-operation and Development.

OECD. 2001b. 2000 Development Co-operation Report. Paris: Organisation for Economic Co-operation and Development.

OECD. 2002. *Reporting directives for the Creditor Reporting System*. Paris: Development Assistance Committee, Organisation for Economic Co-operation and Development.

OECD. 2004. OECD health data 2004. Paris: Organisation for Economic Co-operation and Development.

OECD. 2005. *Paris declaration on aid effectiveness: ownership, harmonisation, alignment, results and mutual accountability*. Paris: Organisation for Economic Co-operation and Development.

OECD. 2006a. *OECD.Stat*. Paris: Organisation for Economic Co-operation and Development. Web site: [www.oecd.org/document/33/0,2340,en_2649_34447_36661793_1_1_1_1,00.html] accessed in May 2006.

OECD. 2006b. *Coverage of ODA committments*. Paris: Organisation for Economic Co-operation and Development. Web site: [www.oecd.org/dataoecd/49/22/1911065.xls] accessed in May 2006.

OECD. 2006c. *Coverage of CRS aid activity data by sector*. Paris: Organisation for Economic Co-operation and Development. Web site: [www.oecd.org/dataoecd/49/60/24735282.PDF] accessed in May 2006.

PAHO. 2003. *Health accounts approaches*. Pan-American Health Organisation.

PAHO. 2005. Health analysis and information systems area. Regional core health data initiative: technical health information system. Washington DC: Pan-American Health Organisation.

Pearson M. 2002. Benefit incidence analysis: how can it contribute to our understanding of health systems performance. London: DFID Health Systems Resource Centre.

PHR*plus*. 2004. National Health Accounts trainers manual. Bethesda MD: Partnership for Health Reformplus, Abt Associates.

Poullier JP, Hernandez P and Kawabata K. 2003. National Health Accounts: concepts, data sources and methodology. In: C. J. Murray and D. B. Evans (ed). *Health systems performance assessment: debates, methods, and empricism*. Geneva: World Health Organisation, p. 185-194.

Powell-Jackson T, Borghi J, Mueller D, Patouillard E and Mills A. 2006. Countdown to 2015: tracking donor assistance to maternal, newborn and child health. *Lancet*.

Reuser M, Willekens F and Eckhardt-Gerritsen J. 2004. Real time estimates for donor assistance for population and AIDS activities. The Hague: Netherlands Interdisciplinary Demographic Institute.

Roberston RL, Zschock DK and Daly JA. 1979. Guidelines for analysis of health sector financing in developing countries. Bethesda, MD: United States Department of Health, Education and Welfare.

Roberts J. 2003. *Managing public expenditure for development results and poverty reduction*. Working Paper, 203. London: Overseas Development Institute.

Rose A. 2005. *Results-orientated budget practice in OECD countries*. Working Paper, 209. London: Overseas Development Institute.

Sarbib JL, Nankani G and Patel P. 2006. The Booster Program for Malaria Control: putting knowledge and money to work. *Lancet* **368**: 253-7.

Schieber GJ and Poullier JP. 1986. International health care spending. *Health Aff (Millwood)* **5**: 111-22.

Sutcliffe S and Court J. 2005. *Evidence-based policymaking. What is? How does it work? What relevance for developing countries?* London: Overseas Development Institute.

Travis P, Bennett S, Haines A, et al. 2004. Overcoming health-systems constraints to achieve the Millennium Development Goals. *Lancet* **364**: 900-6.

UNAIDS. 2005. *Resource needs for an expanded response to HIV/AIDS in low- and middle-income countries*. Geneva: Joint United Nations Programme on HIV/AIDS (UNAIDS).

UNFPA. 2004. Financial resource flows for population activities in 2002. New York: United Nations Population Fund.

van Dalen H and Reuser M. 2005. *Assessing size and structure of worldwide funds for population and AIDS activities*. The Hague: Netherlands Interdisciplinary Demographic Institute.

van Doorslaer E, O'Donnell O, Rannan-Eliya RP, et al. 2006. Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. *Lancet* **368**: 1357-64.

Waddington C, Martin J and Walford V. 2005. *Trends in international funding for malaria control*. London: HLSP Institute.

Wagstaff A and van Doorslaer E. 1993. Equity in the finance and delivery of health care: concepts and definitions. In: E. van Doorslaer, A. Wagstaff and F. Rutten (ed). *Equity in the finance and delivery of health care: an international perspective*. Oxford: Oxford University Press,

WHO. 1978. *Financing of health services: a report of a WHO study group*. Technical Report Series, No. 625. Geneva: World Health Organisation.

WHO. 2000. The World Health Report 2000: health systems: improving performance. Geneva: World Health Organisation.

WHO. 2003. Guide to producing national health accounts with special applications for low-income and middle-income countries. Geneva: World Health Organisation.

WHO. 2005. Global tuberculosis control: surveillance, planning and financing. Geneva: World Health Organisation.

WHO. 2006a. World Health Report 2006: statistical annex, explanatory notes. Geneva: World Health Organisation.

WHO. 2006b. *National Health Accounts: country information*. Geneva: World Health Organisation. Web site: [www.who.int/nha/country/en/#N] accessed in May 2006.

WHO. 2006c. *Immunization financing: countries*. Geneva: World Health Organisaition. Web site: [www.who.int/immunization_financing/countries/en/] accessed in May 2006.

WHO. 2006d. *Immunization financing: data limitations*. Geneva: World Health Organisaition. Web site: [www.who.int/immunization_financing/data/about/limitations/en/index.html] accessed in May 2006.

World Bank. 2006. World development indicators 2006. Washington DC: The World Bank.

Conflict of Interest

We declare that we have no conflict of interest

Acknowledgements

Support and funding for this work was in part provided by the United States Agency for International Development (USAID) through the Basic Support for Institutionalising Child Survival (BASICS) project. We would like to thank David Collins and two anonymous reviewers for reviewing the paper and providing helpful comments. Tim Powell-Jackson and Anne Mills work for the Health Economics and Financing Programme, which is funded by the UK Department of International Development. The views represented in this article are those of the individual authors and do not necessarily represent the views of their institution.