Guide to producing national health accounts

with special applications for low-income and middle-income countries

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Guide to producing national health accounts

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Technological advances, demographic transitions, rapidly changing patterns of morbidity and mortality, and the emergence of public health problems such as HIV/AIDS all call for a more efficient use of resources, and in many cases more resources. In a wide range of countries, health care is provided by a complex and shifting combination of government and private sector entities (both for profit and non-profit). In such an environment, policy-makers need reliable national information on the sources and uses of funds for health, preferably comparable across countries, in order to enhance health system performance.

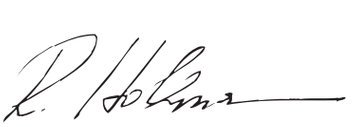
National health accounts (NHA) help provide that information. They depict the current use of resources in the health system. If implemented on a regular basis, NHA can track health expenditure trends, an essential element in health care monitoring and evaluation. NHA methodology can also be used to make financial projections of a country's health system requirements. Finally, they offer the possibility of comparing one country's health system expenditures with those of other countries — of particular value when setting performance objectives and benchmarks.

As the global community seeks better ways to alleviate world poverty and to ensure better health in low-income and middle-income countries, NHA provide a basis for tracking external resources contributed to the health sector. Health accounts can facilitate monitoring the implementation of resources within initiatives such as the Poverty Reduction Strategy Plan, and they can help track use of resources to achieve the Millennium Development Goals and other global initiatives.

National health accounts are designed to answer precise questions about a country's health system. They provide a systematic compilation and display of health expenditure. They can trace how much is being spent, where it is being spent, what it is being spent on and for whom, how that has changed over time, and how that compares to spending in countries facing similar conditions. They are an essential part of assessing the success of a health system and of identifying opportunities for improvement. In the long term, a country can institutionalize the health accounts process and produce a time series of standardized tables, permitting a more thorough assessment of the progress being made toward national goals for the health system.

The World Health Organization, the World Bank, the United States Agency for International Development and other partners joined forces to produce this *Guide* to assist countries embarking on the measurement of their national health expenditures. The preparation of the *Guide* benefited from close collaboration with the Organisation for Economic Co-operation and Development, whose manual entitled *A system of health accounts* serves as the basis for this *Guide*. Our aim is to provide a resource that allows national teams of health accountants to take advantage of the common experience of those who have already embarked on NHA exercises and to begin a dialogue that can lead to international standards in health expenditure measurement.

It is our hope that this *Guide* — and its future updates — will facilitate the task of countries interested in embarking on a national health accounting exercise. We hope that it will be useful as a practical resource for the training of health accountants. The *Guide* reflects a consensus among many of the leading experts on national health accounting, but we clearly recognize that each new set of NHA produced gives rise to a new set of questions about the right way to account for specific expenditures. Thus the *Guide* represents the first steps on a journey — not the final destination.



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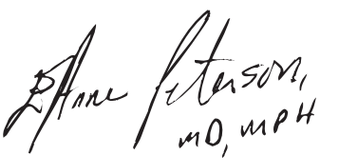

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Preface

National health accounts (NHA) constitute a systematic, comprehensive, and consistent monitoring of resource flows in a country's health system. They are a tool specifically designed to inform the health policy process, including policy design and implementation, policy dialogue, and the monitoring and evaluation of health care interventions. They provide the evidence to help policy-makers, nongovernmental stakeholders, and managers to make better decisions in their efforts to improve health system performance.

This *Guide* takes advantage of extensive work on standards for health accounts undertaken for the Organisation for Economic Co-operation and Development (OECD). Ten years of endeavour by national experts in health accounts in OECD Member countries culminated in the publication in 2000 by OECD of *A system of health accounts*, a manual proposing a set of classifications and dimensions for use in health accounting. The standards embodied in the OECD system of health accounts (SHA) have been adopted by the European Union as the goals towards which Member states are to work, and many non-OECD countries have decided to use the SHA standards as the basis for their accounts as well. The SHA framework can be related to other national accounts frameworks, which can help in the implementation of health accounts. Over time, the SHA framework could evolve into a truly international standard for health accounts. This *Guide* encourages countries to base their accounts on the SHA standards, especially if they wish to use a framework that facilitates international comparison.

The *Guide* differs from the SHA standards in several ways. Most of these differences are small, and are adopted to make it easier for low-income and middle-income countries to apply health accounting rules. The *Guide*, however, departs from the SHA standards in one significant respect. In the OECD system of health accounts, the boundary drawn around the set of activities called health expenditure encompasses those activities "performed either by institutions or individuals... through the application of medical, paramedical, and nursing knowledge and technology". This *Guide* considers health expenditure as all expenditures for activities whose primary purpose is to promote, restore or maintain health for the nation and for individuals. This broader definition includes traditional medicine and infrastructure development (which appear only as memorandum items in the SHA framework). Even in this departure, health accountants are strongly encouraged to structure their work in a way that permits estimation of the SHA concept of health spending, should that differ from the concept chosen for national policy purposes.

The health accounts described in this *Guide* possess characteristics that are vital for successful use in policy development and evaluation. They are **comprehensive**, covering the whole health system and all the entities that act in or benefit from that system. They are **consistent**, using definitions, concepts, and principles that are the same for each entity and each transaction measured. They are **comparable** across time and space, allowing evaluation of changes in health expenditure over the years and of differences in experience among different geopolitical entities. They are **compatible** with other aggregate economic measurement systems, so that health expenditure can be examined in an overall economic context. They are **timely**, providing accurate and useful information when policy-makers need it. They are **accurate**, so that those policy-makers can safely use the information they contain to make sound decisions. They are **sensitive** to policy concerns, providing information with the level of detail needed for good macroeconomic planning. And they are **replicable**, providing the openness needed for users to assess the validity of the figures they contain and for staff to update and extend them.

We cannot over stress the importance of institutionalizing a nation's health accounts. By "institutionalization" we mean having an established organizational "home" and stable technical capacity to develop ongoing expenditure estimates. Experience around the globe has shown that a time series of national health expenditure estimates is infinitely superior to a one-time exercise. A time series provides an invaluable temporal context in which policy analysts can look at a given year's figures, providing trend patterns in financing and consumption against which to assess progress towards meeting health system goals. Consistent and comparable estimates require consistent and stable methods and data, which in turn are greatly facilitated by a stable location for the health accounts team. Global experience has also shown that such a location is most effective when it is found within the central government.

A critical part of the institutionalization process is the development of a solid database to use in preparing the health accounts. Indeed, the early phases of the health accounting project in any country are equally devoted to preparing estimates of national health expenditure and to organizing and evaluating the data available for the project. Global experience has shown that the development of an information catalogue and the identification of gaps and weaknesses in the data available are absolutely essential steps in preparing and perpetuating high-quality health accounts. In essence, this work reflects the fixed costs of producing health accounts, and investment in an adequate base will reduce the cost of each subsequent cycle of estimates.

The framework laid out in the *Guide* is only an early step in the development of internationally comparable health accounts. For most countries, what is described here can be accomplished in the short term, albeit perhaps with considerable effort; for other countries, it represents a medium-term goal. No two countries have completely comparable health systems, and no two have completely comparable health accounts. This *Guide* is an important step on the path towards international agreement on standards and practices in depicting financial flows through a nation's health system and the effect of those flows on the health of the population.

Like health accounting itself, the contents of this *Guide* must be seen as a work in progress. The authors have attempted to distil best practices from health accountants around the world, but the *Guide* can only be a snapshot of what is known and done. Through active international sharing of ideas, experiences and case studies, health accountants worldwide can pool their knowledge and energy to improve their work and to establish and refine the body of expertise in health accounting. To the extent that the *Guide* helps to set the stage for this activity, it serves its purpose well. To the extent that the lessons learned in countries developing health accounts can be used to update and improve the *Guide*, it can serve its purpose even better.

Production of this *Guide* was financed by the World Health Organization (WHO) (with the support of funds from Japan and the Netherlands), the World Bank (with the support of the Norwegian Trust Fund), and the United States Agency for International Development (USAID) through its Partnerships for Health Reform Project. The Organisation for Economic Co-operation and Development (OECD) hosted three meetings of the steering committee at its headquarters, and the Swedish International Development Agency hosted a meeting of sponsors, contributors, and selected NHA teams as well as funding the consultancy of Catharina Hjortsberg. The participation of Ravindra Rannan-Eliya was partially funded by the Asia-Pacific National Health Accounts Network, through a grant provided by the Rockerfeller Foundation.

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Chapter 1

Introduction to national health accounts and this *Guide*

1.01. The goal of this *Guide to producing national health accounts* is to provide the conceptual and practical information needed to set up and implement national health accounts (NHA) in a country. The *Guide* reflects developments in international standards and best practice experience gained from real-world efforts to draw up develop relevant and useful health accounts. It is designed for use by analysts who have to estimate the amount and characteristics of spending for health in their country, and for the senior health administrators or planners who supervise those analysts.

1.02. Put simply, NHA are a set of tables in which are arrayed the various aspects of a nation's health expenditure. An example of such an account is shown in Table 1.1 (see page 10). What distinguishes health accounts from other forms of expenditure review are one or more of the following:

- a rigorous classification of the types and purposes of all expenditures and of all the actors in the health system;
- a complete accounting of all spending for health, regardless of the origin, destination, or object of the expenditure;
- a rigorous approach to collecting, cataloguing, and estimating all those flows of money related to health expenditure; and
- a structure intended for ongoing analysis (as opposed to a one-time study).

1.03. When constructed properly, a nation's health accounts complement other reporting systems to provide a more complete picture of the performance of the health system. Because of the similarity between measurement concepts underlying the NHA and the system of national accounts used to estimate a country's gross domestic product (GDP), health accounts can be used to illuminate the interrelationship between health spending and the total output of the economy. Because of the way in which financing is displayed, health accounts can help in understanding the roles of government, industry, households, and external organizations (such as the Red Cross or Red Crescent) in the purchase of health care. Because of their reliance on standardized classifications of providers and functions, NHA illustrate the linkages between financing and delivery and outcomes of health services and goods.

National health accounts in the context of health systems and health system performance measurement

1.04. Because the principal goal for developing health accounts is to support health system governance and decision-making, it is useful to start by clarifying why the NHA are being developed and how they can help to achieve health system goals.

1.05. All nations have health systems, which have been described as "all the activities whose primary purpose is to promote, restore or maintain health"*(1)*. Whether arrived at by conscious creation or by evolution, health systems exist to produce some benefit for societies and their citizens. A health system mobilizes and channels resources into institutions and uses them for individual or social consumption. This consumption of goods and services produces a flow of benefits to the population, which results in some new level or stock of health.

1.06. The performance of a health system reflects a number of facets of its operation. There is the effect of the system on the health of the population. There is the extent to which financing and risk pooling mechanisms afford financial protection from the economic burden of illness and prevent impoverishment resulting from catastrophic expenses for health care. There are other dimensions as well, for example the responsiveness of health systems to the people they serve in aspects such as respect of dignity and privacy. Health system performance must be assessed not only in terms of the level of benefits achieved but also by their distribution in societies. If a nation's health system can be thought of as society's response

to its citizens' desire to achieve certain benefits or outcomes and to distribute these benefits fairly, health system performance refers to how well the system achieves those goals.

National health accounts as an input to stewardship for improving health system performance

1.07. Governments and others can use health accounts in several ways. In addition to a picture of the financial state of the health system, health accounts can provide information relevant to designing better health system policies. Experience in the countries that have developed and used health accounts has been that the accounts are very helpful in answering questions such as those listed below.

1.08. *How are resources mobilized and managed for the health system?* Health accounts help provide the basis for assessing the adequacy of financial resources available to the health system, and for thinking about strategies to increase the resources available. They indicate the types of social structures in the public and private sectors that have been created to raise, organize and pool funds, and to pay for the production of health goods and services.

1.09. *Who pays and how much is paid for health care?* Knowledge about who finances health care and how large the financial burden is relative to their means illuminates the nature of financial protection and the fairness of the financial burden. Knowing who contributes to health spending is also valuable information in designing policies and interventions. For example, many countries are decentralizing their public finances and relying more on provincial and municipal funding for social services. Health accounts can show how well and how fairly those arrangements pool risks across the population. They can also clarify how institutions that pay for or purchase health care compensate providers and with what effect.

1.10. *Who provides goods and services, and what resources do they use?* Answers to these questions describe the allocation of expenditures to different types of providers and to the production factors used in the system. These are dimensions of economic planning and of the analysis of economic efficiency, both of which are important focuses of decision-making.

1.11. *How are health care funds distributed across the different services, interventions and activities that the health system produces?* Health accounts show what is produced and what is spent on the different products. The commitment of resources to health functions is a valuable measure of the actual priorities of a health system. Such information indicates whether or not an allocation always reflects actual priorities. For example, health accounts reveal the share of spending claimed by collective public health interventions, reproductive health, or cardiovascular conditions. Measures like these are also excellent indicators of whether policies to shift resource priorities are working.

1.12. *Who benefits from health care expenditure?* This question can be answered along a variety of different dimensions, including income groups, age/sex groups, geographical regions, health status or conditions, or types of interventions provided. Knowing where the benefits from health expenditure land in terms of their financial value is an important measure in assessment of distributional fairness.

1.13. The attraction of NHA as a tool for policy analysis is that the approach is independent of the structure of a country's health care financing system. Health accounts work equally well in single-payer models and in multi-payer systems, in systems with mainly public providers as well as in those with a mix of public and private providers, in systems undergoing rapid change as well as in those in a steady state, and in systems facing the challenge of epidemic disease as well as in those challenged by ageing of the population.

1.14. Evidence on health financing can contribute to improved performance. Financing information is an essential input for strengthening policies to improve the functioning of health systems. It also contributes to the measurement of the factors that explain the outcomes of the system and whether or not those outcomes are achieved efficiently. For example, in many countries more funds and better-managed financial resources are an essential intermediate step in improving health systems. And achieving a fair distribution of the heavy financial burden of health care — especially reducing its negative effect on the poor — is one of the goals of health systems.

1.15. Although NHA have been proved to be a useful way to organize and present financial information about the health system, they are not the answer to all health policy questions. Health accounts focus on the *financial* dimension of the health system, and NHA data cover health *expenditure*. The health accounts themselves do not distinguish between effective and ineffective expenditures. To answer many policy questions, NHA information must be combined with non-financial data from sources such as epidemiological studies, population surveys, and the like.

Analytical dimensions of health expenditure

1.16. The tables that comprise a nation's health accounts represent different views of the same object - national expenditure on health. Although the viewpoint of each table depends upon which dimensions of health expenditure are being observed, at least in theory the object itself remains unchanged by the shift in viewpoint.

1.17. International experience in the development and use of health accounts suggests a number of useful dimensions for consideration. Some dimensions are particularly suited to assist in the estimation of total spending. Others are particularly suited to evaluating or formulating health policy. Taken as a group, these dimensions address almost every possible request made of the health accounts regarding system performance. These dimensions are:

- financing sources: institutions or entities that provide the funds used in the system by financing agents;
- financing agents: institutions or entities that channel the funds provided by financing sources and use those funds to pay for, or purchase, the activities inside the health accounts boundary;
- providers: entities that receive money in exchange for or in anticipation of producing the activities inside the health accounts boundary;
- functions: the types of goods and services provided and activities performed within the health accounts boundary;
- resource costs: the factors or inputs used by providers or financing agents to produce the goods and services consumed or the activities conducted in the system;
- demographic characteristics of beneficiaries: policy-relevant groupings of those receiving or affected by the goods and services consumed within the health accounts boundaries — age, sex, race, urban or rural residence, ethnicity, and so on;
- socioeconomic status of beneficiaries: policy-relevant groupings of those receiving or affected by the goods and services consumed within the health accounts boundaries — grouped along the lines of educational attainment, income, wealth, or occupation;
- health status of beneficiaries: policy-relevant groupings of those receiving or affected by the goods and services consumed within the health accounts boundaries — groupings typically include condition or disease state, functional status, or type of intervention received;
- regions: subnational groups of the entities involved in the financing or consumption of goods and services transacted within the health accounts boundaries.

Classification schemes for health expenditure

1.18. To understand the myriad transactions that take place in the nation's health system, health accountants make use of classification schemes that allow them to "roll up" or summarize the economic activity in a meaningful way. These classification schemes group transactions that share common characteristics in one or more of the dimensions mentioned above, and are at the heart of the NHA methodology.

1.19. A classification scheme should satisfy several criteria:

- It should represent an important, policy relevant dimension, and should partition the dimension in policy relevant ways.
- It should partition the dimension in a mutually exclusive and exhaustive way, so that each transaction of interest can be placed in one — and only one — category.
- It should respect and reflect, to the extent possible, existing international standards and conventions.
- It should be feasible to implement using the data available.

1.20. To a certain extent, these criteria can create a conflict for the health accountant. For example, the national policy debate may dictate the use of a categorization schedule very different from that found in other countries.

1.21. Like the people they serve, national health systems exhibit as many similarities as they do differences. The differences, which can be traced back to cultures, history, economic organization, and sociopolitical dynamics, present a challenge not only to policy-makers interested in adopting best practices in health delivery and financing from around the world, but also to health accountants interested in adopting best practices in measuring national health expenditure. Fortunately (at least for health accountants), the fundamental building blocks of health systems — the entities that make them up — are fairly similar across nations. National health systems tend to perform many similar tasks and functions, often with institutional entities that have similar characteristics. Consequently, the classification schemes used can be quite similar across national systems. Ready-made classification schemes exist for some of the dimensions mentioned above, although not all these schemes were developed specifically for health accounting. These are described in Chapters 3 and 4 and come from national accounting and other statistical reporting environments.

The International Classification for Health Accounts

1.22. This *Guide* shows how to implement NHA using the International Classification for Health Accounts (ICHA) developed by the Organisation for Economic Co-operation and Development (OECD) and published in *A system of health accounts (2)*. The ICHA is a comprehensive classification system in three important NHA dimensions: financing agents, providers, and functions. It was designed to be compatible with a number of existing classification schemes and practices in international economic statistics — most importantly, with the system of national accounts (SNA).[1] The ICHA classifications in the OECD system of health accounts (SHA) are accompanied by detailed definitions of each item in the scheme.

[1] The system of national accounts (SNA) is a broad structure for national economic accounting, developed jointly by the Commission of the European Communities, the International Monetary Fund, the Organisation for Economic Co-operation and Development, the United Nations, and the World Bank. The rules and structure of the SNA are contained in a manual called *System of national accounts* 1993, typically abbreviated SNA93. The foreword to the SNA93 describes it as "a comprehensive, consistent, and flexible set of macroeconomic accounts intended to meet the needs of government and private sector analysts, policy makers, and decision takers". It provides the definitions that underlie such concepts as gross domestic product (GDP).

1.23. There are several reasons why health accountants should use international classification schemes as the basis for their work. One reason is that doing so makes cross-national comparisons of health expenditure possible. Another reason is that international schemes have already have undergone considerable review and validation, and using them can save the time and cost of developing a schedule from scratch. Yet another reason is that significant economies of scale are to be found in using classifications in common with those used by national income accountants. Also, as has been mentioned, the intrinsic similarities among national health systems make it likely that the international schemes can be applied in a fairly straightforward manner.

1.24. The ICHA is used in this *Guide* precisely because it is broadly applicable to a wide variety of health system structures. It is also used here because it has been tested in a number of health accounts projects, not only in the developed countries of the OECD but also in middle-income and lower-income countries just beginning to develop their health accounts (Box 1.1).

Box 1.1
Experience in implementing the system of health accounts worldwide

This *Guide* uses the OECD system of health accounts (SHA) as the basis for developing health accounts. Not all countries use the SHA; some health accounts are built on the framework of the system of national accounts (SNA) and included in a satellite account, while others have a long-standing structure that varies in the degree of compatibility with either the SHA or the SNA. Following the publication of the SHA manual in May 2000, however, a number of countries have begun to develop or modify their health accounts to bring them into alignment with the SHA standards.

OECD Member countries are currently at different stages in implementing the SHA manual. As of the summer 2002, 18 had a major SHA study completed or under way, 6 had begun preparations for such a study, 3 were considering implementation but had not yet allocated resources, and 3 had no plans for implementation. Several countries were reporting regularly using the SHA framework; more often, the SHA implementation was still at an experimental stage and results had not yet been published.

The attraction of the SHA framework for many non-OECD countries has been that, for the first time, it offers a means to compare both the level and structure of their health care spending with other countries in the same region, something that had not hitherto been possible for those countries outside the OECD. Early drafts of the SHA manual were available to national health accounts (NHA) experts in the Asia-Pacific regions, and one of the first NHA systems based on the ICHA classification system was developed in the Hong Kong Special Administrative Region (SAR) of China. The Republic of Korea has replaced its previous health accounting framework with the SHA, and Australia and Japan have developed the capability to display their accounts in SHA format as well as in their existing national frameworks.

Sri Lanka, in establishing its first official NHA system, chose to base it on the SHA, and its first estimates for the period 1990–1999 were released in 2001. Since then, the Hong Kong SAR of China, Samoa and Thailand have all released SHA-based NHA estimates. By 2003, several other countries were also in various stages of establishing NHA systems based on SHA, including Bangladesh, Indonesia, Malaysia, Mongolia and Nepal.

At the time this *Guide* was prepared, Estonia had published health accounts on a SHA basis and others in that geographical area were in the midst of preparing such estimates. In the Americas, Bolivia, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Nicaragua, Panama, Paraguay, Trinidad and Tobago, Uruguay and others had begun work on health accounts incorporating parts of the SHA framework. In the Eastern Mediterranean region, Algeria, the Islamic Republic of Iran, Morocco and Tunisia were among those doing likewise.

1.25. A slavish adherence to the ICHA is not, however, the intent of this *Guide.* Classification schedules drive the policy usefulness of health accounts, and accounts that do not help the people who provide the funding for them are not likely to survive for long. Here and elsewhere, the *Guide* urges the health accounts team to understand the policy issues of the health system so that the health accounts can be structured to be of maximum value to decision-makers. This may require the development of national classification schedules that differ from the ICHA. Nevertheless, even where the national policy uses of health accounts precludes adoption of the international schemes as such, it is still possible to develop categories that can be translated back to the international one, at least at an aggregate level. In some cases, nationally relevant categories can be introduced as subcategories within the existing international classification. In other cases, a crosswalk reconciliation of the national and international schemes can be built so that results can be reported using either scheme. Although national policy relevance remains the primary goal of NHA, international comparability should be considered to be a very important secondary goal.

Similarities and differences between health accounting and national income accounting

1.26. Inevitably, at some point in the health accounts process, health accountants will interact with colleagues working on national accounts. Those unfamiliar with broader social accounting will find a background in the system of national accounts (SNA) useful. Those who are acquainted with the SNA will see that there are many similarities between the SNA and the NHA frameworks, and they will also observe a number of differences. The formal framework that underlies the NHA developed in this *Guide* is presented in the SHA manual, which devotes a chapter to the subject of comparability with the SNA (see paragraphs 1.40 to 1.42 and all of Chapter 8 of *A system of health accounts*) *(2)*. Work is under way to produce a formal crosswalk between the system of national accounts and the system of health accounts. When completed, this crosswalk will facilitate displaying satellite national income accounts as NHA and vice versa. Pending completion of that task, this section of the *Guide* provides a brief summary of the features of the system of health accounts and their links to the system of national accounts. Despite the differences stemming from differing focuses, the two systems exhibit methodological similarities. Cooperation between accountants dealing with national accounts and health accounts is not only possible, but desirable as well.

1.27. First, the two sets of accounts share a similar concept of output. Goods and services are defined in the same way (see paragraphs 6.7 to 6.13 of SNA93). So, too, is the production boundary; this is particularly important in terms of own-account production of personal services (paragraphs 6.17 to 6.22 of SNA93), unsanctioned or illegal provision of health care goods and services (paragraphs 6.30 and 6.31 of SNA93), and transactions in the underground economy (paragraphs 6.34 to 6.36 of SNA93). The accounts also share the same approach to placing a value on output (paragraphs 6.44 to 6.52 of SNA93).

1.28. Second, national health accountants and national income accountants typically employ similar approaches to the estimation of their figures. They rely on many of the same data sources and many of the same techniques for transforming those data into elements of the accounts. Close cooperation between them is clearly desirable.

1.29. Third, both sets of accounts strive to measure the current use of resources in the provision of goods and services. Consumption of fixed capital, whether booked by the provider or not, is estimated and included in the value of goods and services provided (see Chapter VI, Section I, of SNA93). Although this may seem an alien concept to policy-makers, it is a nontrivial part of the nation's consumption of health care and potentially a significant, hidden cost to government in producing health care.

1.30. As a result of these similarities, there should be substantial comparability between of a nation's estimated gross domestic product (GDP) and its estimated expenditures for health. This is important, for one of the most often used cross-national and intertemporal measures of health spending is its ratio to GDP. Health accountants should consider not only the SHA manual, but also the SNA93 manual to be important parts of their toolkit.

1.31. While NHA share many characteristics of satellite accounts accounts in the sense of SNA93, there are differences. Most of these differences concern the way in which flows of resources are treated in the accounts.

1.32. First, NHA and national income accounts differ in their primary perspective of the economic activity of a society. NHA paint a picture of the c*onsumption and financing* of health care goods and services in the economy, while national income accounts paint a picture of the *production* of goods and services and the factors of production involved. This in itself does not affect the value of goods and services provided, but it does radically change the types of information required to produce the estimates.

1.33. Second, the two sets of accounts embody different treatment of government health programmes. Again, in concept they measure the same valuation of the goods and services produced. However, where the national income accounts treat spending by social insurance programmes spending as a transfer to households and the household as the subsequent purchaser of goods and services (paragraphs 8.38 and 8.39 of SNA93), NHA retain the social insurance programme as a direct financer of goods and services, distinct from the household sector.

1.34. Third, the two sets of accounts also differ in their treatment of employer contributions to health care. National income accountants treat employer payments of health insurance premiums as supplements to wages and salaries, while final consumption of goods and services is charged to households (paragraph 8.8 of SNA93). By contrast, national health accountants treat these funds as belonging to employers. In addition, in the national income accounts, employers' operation of health clinics is treated as a cost of production of the employers' principal product; in the health accounts it is considered part of health spending. Thus, although the monetary value of these activities is the same in the two sets of accounts, the way the value is presented differs.

1.35. Finally, NHA and national income accounts differ in how they draw a boundary around the transactions of interest. NHA draw a consumption boundary around health care, while national income accounts draw a production boundary around health care. Thus, national accounts may show the total production of pharmaceuticals, regardless of whether some of that product is exported, whereas health accounts would show only the domestic consumption of pharmaceuticals. Again, this is not a problem when viewed at the macro level, because there is no conceptual difference in how the production or consumption is valued. It is only a problem in terms of how the transactions are divided between the health system and the rest of the economy.

1.36. In sum, the differences between NHA and national income accounts can be traced back to the purposes of the two sets. Health accounts are useful to managers of the health system, who are interested in the flows of funds among and between the various actors in that system. National income accounts are useful to managers of the nation's economy as a whole, who are interested in tracking factors of production and types of goods and services produced.

1.37. There is a practical difference between national health accountants and national income accountants that must be mentioned. National income accountants are responsible for estimates that cover the entire economy. Quite often, relatively solid information at an aggregate level must be distributed among types of goods or services; for example, a relatively solid estimate of retail sales must be distributed by product line. An underestimate in one type of good is offset by an overestimate in another type, leaving the total fairly well estimated. By contrast, health accountants are focused on the

provision of health care goods and services alone; they have the time and energy to refine their figures to make the best possible estimates. Consequently, there are likely to be divergences between the line items for health shown in the national income accounts and those shown in the NHA. Some of the divergence is of little consequence, being merely a difference in understanding how total sales are dispersed among product categories. Other aspects of the divergence represents a different valuation of the total production of the health care system. Discussions between the two sets of accountants can do much to resolve how much of the difference in the published figures is attributable to each of these, and can lead to better estimates in both sets of accounts.

The process of implementing national health accounts and the organization of this *Guide*

1.38. Starting a health accounts project has three phases, and this *Guide* is divided into three parts to address each of those phases. The first phase is the organization stage: the parameters of the project are resolved, the project is staffed and provided with resources, a preliminary sketch is built of the health care financing system, and the structure of the health accounts is laid out. Chapters 2 to 5 discuss these issues. In the second phase, data sources are identified, catalogued, and examined for accuracy and usefulness to the health accounts, and gaps in information are identified. These are the topics of Chapters 6 to 8. In the third phase, the accounts are "populated" with estimates of spending; the assessment of the gaps in information is refined, and the stage is set for recurrent estimates of national health expenditure. Chapters 9 to 14 focus on this stage of the implementation.

Thoughts before embarking

1.39. NHA are proposed as a way to organize and present economic data about the nation's health care system so as to facilitate policy evaluation and formulation.

1.40. It is never possible to estimate health expenditure perfectly and without error. All countries, no matter how sophisticated their systems, combine "hard" financial figures with "soft" estimates and extrapolations of hard-to-measure items. Health accounting is both an art and a science. The NHA team should be prepared for some uncertainty, and should focus their attention on the big items first, without becoming bogged down in small items of inaccuracy. The team will find that common sense and openness are valuable tools to keep at hand.

1.41. All through the process of building health accounts, it is important to keep in mind what decision-makers want and need to know. Awareness of policy objectives and anticipation of those objectives permits health accountants to develop health accounts that provide the best possible support to decision-makers. Support for NHA is necessary at the highest levels of government; if these people are well served they are more likely to pay attention to other NHA findings and to continue their support of the project.

1.42. Finally, it is important to understand that health accounting is an evolutionary process. Early cycles of a country's health accounts may be rudimentary and lacking in detail. As the health accounts mature and the underlying data sources that underlie it are refined and strengthened, more detail and more aspects of the health system can be introduced. Therefore, while reading this *Guide*, first-time health accountants should not despair of accomplishing everything described here at their first attempt. They should select those aspects that are most relevant to their customers and focus their energy and resources on those aspects. Even the health accounts of countries with decades of experience in doing such work are in a state of continuous improvement.

Table 1.1 Sri Lanka national health accounts, sources to providers matrix, 1997 (OECD SHA[a] format)

Health care goods and services by provider industry	OECD SHA[a] classification	Total current expenditure on health	HF.1 General government	HF.1.1 General government (excl. social security	HF.1.2 Social security funds	HF.2 Private sector	HF.2.1 Private social insurance	HF.2.2 Other private insurance	HF.2.3 Private household out-of-pocket expenditures	HF.2.4 Non-profit organizations (other than social scurity)	HF.2.5 Corporations (other than health insurance	HF.3 Rest of the world
Hospitals	HP.1	11 245	9 648	9 648	0	1 597	0		1 430	0	167	
Nursing and residential care facilities	HP.2	25	25	25	0	0	0		0	0		
Providers of ambulatory health care	HP.3	6 849	953	953	0	5 896	0		5 368	472	56	
Offices of physicians	HP.3.1	4 083	10	10	0	4 073	0		4 073	0		
Offices of dentists	HP.3.2	0	0	0	0	0	0		0	0		
Offices of other health practitioners	HP.3.3	0	0	0	0	0	0		0	0		
Outpatient care centres	HP.3.4	829	829	829	0	0	0		0	0		
Medical and diagnostic laboratories	HP.3.5	1 190	0	0	0	1 190	0		1 190	0		
Providers of home health care services	HP.3.6	0	0	0	0	0	0		0	0		
Other providers of ambulatory health care	HP.3.9	612	114	114	0	498	0		26	472		
Retail sale and other providers of medical goods	HP.4	6 742	0	0	0	6 742	0		6 742	0		
Dispensing chemists	HP.4.1	4 761	0	0	0	4 761	0		4 761	0		
All other sales of medical goods	HP.4.2-4.9	1 289	0	0	0	1 289	0		1 289	0		
Provision and administration of public health programmes	HP.5	1 663	1 663	1 663	0	0	0		0	0		
General health administration	HP.6	1 436	1 329	1 329	0	107	0	107	0	0		
Government	HP.6.1	1 314	1 314	1 314	0	0	0		0	0		
Social security funds	HP.6.2	15	15	15	0	0	0		0	0		
Other social insurance	HP.6.3	0	0	0	0	0	0		0	0		
Other (private) insurance	HP.6.4	107	0	0	0	107	0	107	0	0		
All other providers of health administration	HP.6.9	0	0	0	0	0	0		0	0		
Other industries (rest of the economy)	HP.7	423	423	423	0	0	0		0	0		
Occupational health care	HP.7.1	5	5	5	0	0	0		0	0		
Private households	HP.7.2	0	0	0	0	0	0		0	0		
All other secondary producers	HP.7.9	419	419	419	0	0	0		0	0		
Rest of the world	HP.9	6	6	6	0	0	0		0	0		
TOTAL		28 389	14 047	14 047	0	14 342	0	107	13 540	472	222	

Source: Sri Lanka National Health Accounts (2001).
[a]System of health accounts.

Chapter 2

Getting organized: gathering the resources to prepare national health accounts, and sketching the health system

2.01. The goal of health accounting is to array information about a nation's health system in ways that facilitate health planning, policy, and system performance evaluation. To do this, health accountants must develop pictures of the flows of resources through the health system, refining the overall picture of the system so that details emerge.

2.02. This process requires a combination of human and material resources to undertake the health accounting project itself. It also requires some notion, however provisional, of what the health system looks like. These topics are the subject of this chapter.

Instituting the health accounts project

The cost of a health accounts project

2.03. The cost of implementing and sustaining national health accounts (NHA) varies by country. The amount of resources needed depends upon the current state of a nation's health and financial information systems. If sufficient data are available from existing sources to estimate NHA, then costs are lower. If external expertise and advice are needed, then costs may be higher — but external resources may fund these costs initially. If the institutions collaborating on NHA contribute resources in kind, such as their staff, computers and space, the additional budgetary costs can be very modest. Especially if a country is committed to producing them on an ongoing basis, the cost of sustaining NHA within government institutions is modest, as it becomes a routine part of economic analysis. In a number of countries for which actual figures for development of health accounts are available, first-year costs have been in the range of US$ 50,000 to US$ 75,000 (excluding the cost of new survey work); subsequent year costs have been largely absorbed into the cost of producing recurrent statistics. A number of countries have used external financial support to undertake the initial cycles of their health accounts.

Timeline for setting up health accounts

2.04. Experience shows that in most countries useful NHA can be assembled in 12–18 months with a team of 3–6 analysts working part-time. Preliminary figures sometimes can be produced in a shorter timeframe, but more complete, detailed and specific analyses may require more time, especially if a household or provider survey must be undertaken specially for that purpose or if the International Classification for Health Accounts (ICHA) schemes are being implemented for the first time. Similarly, more time and expenditure are required if the itemized coding process of all underlying budgetary and other administrative reporting systems needs revision.

Housing the health accounts project

2.05. National authorities have taken different approaches to housing the NHA project. Four factors should influence the choice of a location:

- Results can be easily made available to institutions and people who make health policy.
- Political and institutional interference is minimized, so that work can continue without significant upheaval resulting from political and institutional changes.
- Representatives from different institutions that can contribute to NHA can come together to collaborate without major difficulties.
- There is access to the information needed to prepare the accounts.

2.06. The location best meeting these conditions differs from country to country. The location may be a government department, such as the ministry of health, finance, statistics, or planning. Or it may be a specialized agency of government, such as a national health inspectorate, national health economics research institute or national health statistics agency, or national health care financing body. In some countries, the NHA project has been housed outside the government in a university or nongovernmental research institute, although it may be difficult to sustain the exercise for many years outside of government-linked institutions.

Resources required for the health accounts project

2.07. As is true of any production process, NHA rely upon factors of production. Basically, these factors can be divided into three categories: labour (people), capital (tools), and raw material (data).

People

2.08. In most countries, the task of preparing health accounts is best accomplished by a small team of experts, working for (or with) concerned government agencies. In some cases, it may be only a single individual breaking new ground.

2.09. Although there is no professional accreditation for health accounting, certain skills and aptitudes are necessary. The NHA team or analysts or health accountant should be drawn from those who are familiar with national economic statistics and accounting practices, those who are knowledgeable about the nation's health system and health policies, and those who have experience with using the data and information generated by different entities in the health system. Health accounting does not necessarily require training in economics, but having at least one health economist available — if only as a consultant — is very helpful. The most important attributes of a health accountant are a facility with numbers, a willingness to question those numbers, and a willingness to look for and consider alternatives to existing data sources.

2.10. Where practical, the health accounts team should include staff from several different organizations. This variety of background provides access to many different data sources perhaps unknown to one organization, and facilitates a critical appraisal of team results.

2.11. Experience suggests that the health accounts team should have a steering committee as well. A committee of high-level representatives from stakeholder organizations can help to keep the project on track. Such organizations include the ministries of health, finance, and planning; the national statistical office; the social health insurance organization; academic groups; and provider and consumer organizations. Developing health accounts often requires support from different institutions and health system regulators, and it is useful to have representatives on the steering committee who can request or even require their organizations to produce needed information or to validate available figures. A steering committee can serve as an authoritative conduit for communicating findings to policy-makers, and it facilitates the institutionalization of the NHA effort by establishing ownership at a high level of the nation's sociopolitical organization.

Tools

2.12. NHA are quite data-intensive, but the actual tools required to maintain the accounts are modest. The tables can be assembled using a standard spreadsheet program on a typical desktop computer. The same spreadsheet programs also facilitate development of graphics and charts. Most of these programs can be linked to off-the-shelf database software that can be used to assemble the underlying information.

2.13. Although the NHA themselves do not require a lot of computing power, there are times when large survey datasets must be processed. In these instances, the services of another organization (such as the national statistical organization) may be available to do that processing. If not, a more powerful desktop computer and a good statistical software package will be necessary.

Data

2.14. Health accounts require lots of data. This subject will be addressed in greater detail in Chapters 6 to 8 but warrants a brief discussion here. To complete basic estimates of total spending on health and useful breakdowns, data on various types of government and private expenditures are needed. These can often be found in readily accessible sources, such as government financial accounts and records, reports of health insurance agencies, and existing surveys. Much can be done with information that is available; even limited and incomplete data can yield useful findings and stimulate greater interest in acquiring more knowledge. It is quite likely, however, that pursuit of specific NHA objectives will require some new data collection, and one of the primary roles of the steering committee is to advocate the collection of new data as well as to secure access to all existing data sources. As important as the collection of data is the freedom to replace published records — usually held to be official statistics — with better estimates when studies of the relevant kind exist. The value of a good set of health system accounts depends on the quality of the data that underlie them as much as on the staff who prepare them.

Developing a preliminary sketch of the nation's health system

2.15. Although subsequent chapters in this *Guide* describe the process of rigorously defining the dimensions of the health care system, it is important to start with some overall picture of what that system looks like. Just as explorers start with existing maps as they develop a more detailed description of the terrain, this early sketch of the health care system is used by health accountants to guide their efforts in classification and measurement of resource flows in the system. This sketch may already exist in some form, or it may be necessary to write down what is currently kept in the minds of key informants[2], but in either case a review of the material as an orientation exercise is well advised.

2.16. Table 2.1 (see pages 16 and 17) provides an example of a rough sketch of a nation's health care system. As with many of the health accounting activities described in this *Guide*, especially activities in the formative steps, development of such a table benefits greatly from a diversity of inputs. Key informants — members of the steering committee, analysts from ministries, boards, and trade associations, and academic researchers — each have a perspective that provides additional information. The nascent health accounts team that takes the time to hold a brainstorming session to develop this sketch will find their effort well worth the cost.

2.17. The utility of this type of sketch lies in its initial guidance to the health accounts team. It is not essential to have detailed information for each cell in a table such as that in Table 2.1 — indeed, that is in part what the health accounts are intended to provide. The value of such a sketch lies in the direction it provides to sources of information, to data repositories, and to additional key informants. The sketch helps the health accounts team to organize their early efforts so that they can deal with what appear to be the main actors in the system.

[2] In this *Guide*, the term "key informant" is used in the sense that it is used by anthropologists and sociologists, that is, to refer to people with detailed — and often undocumented — knowledge of the workings of the health system and the health care financing system.

2.18. The picture thus developed should, however, be viewed as a preliminary rather than final outline. The charts of early explorers were refined by subsequent explorations which changed both small details and large ones. Similarly, the health accounting project may very well change the commonly held perception of the health system. The health accounts team should bear this in mind as they undertake their work, and keep an open mind about the number, relative position, and activities of the actors in the health system. The first changes to this sketch may well come about as the team undertakes the activities described in the next chapter — defining and categorizing health expenditure.

Table 2.1 Profile of health subsystems in Lebanon

Benefits by health subsystems	Coverage / special categories	Principal financing sources	Provider-payer relationship	Percentage of population covered or eligible	Size of operation
Describes types of services and benefits available	Describes coverage and eligibility criteria, special programmes for specific population groups	Describes main sources of financing	Describes relationship between financing and service delivery functions	Number of people covered or eligible to be covered by health system nationwide	As indicated by staff, beds, or number of facilities
Government Services/Ministry of Health					
a) Provides comprehensive public health services: primary, preventive and curative care b) Performs the following financing functions: • Hospitalization for anyone not covered under an insurance plan • Subject to limits and restrictions pays for chemotherapy, open heart surgery, dialysis, renal transplant, and drugs for chronic conditions	• Everyone not covered under an insurance plan • Highly subsidized primary and curative care for the entire population	• Ministry of Finance (general tax revenues) • Co-payments for services • Donor assistance • World Bank loan	• Ministry of Health purchases services from private providers • The Ministry of Health also runs hospitals where staff are paid on salary	43% of the population	• 9 working public hospitals (482 beds) • 23 primary health care centers • 176 dispensaries
National social security fund					
a) Curative care services, pharmaceuticals, open heart surgery, kidney transplant, and renal dialysis b) Does not cover dental care, opthalmology, immunization, and treatment abroad	• Those working in the formal private sector, contracted employees, wage earners in the private sector • Dependants of beneficiaries	• Government budget • Payroll taxes • Co-payments	Has own facility but largely purchases services from private providers	30% of the population	• One Ministry of Health hospital is run under the director of the national social security fund

Civil servants cooperative					
a) Curative care including hospitalization, physician specialist, and ambulatory care, pharmaceuticals b) Subject to limits and restrictions, covers dental care, ophthalmology, and treatment abroad c) Same benefit as Ministry of Health for open heart surgery, and kidney transplant. Full coverage for renal dialysis	• Government employees and their dependants	• Ministry of Finance • Co-payments	Purchases services from the private sector	8.8% of the population	
Armed forces (army, ISF, GS, SS)					
a) Curative care including hospitalization, physician specialist and ambulatory care, pharmaceuticals b) Covers all dental care, and ophthalmic care with co-payments c) Subject to limit, covers preadmission costs associated with treatment abroad d) Covers all expenses associated with open heart surgery, kidney transplant, and renal dialysis	Those employed in the army and security services and their dependants	• Ministry of Finance • Transfers from Ministry of Defence budget	The army has its own facilities where employees are paid a salary. It also purchases services from the national social security fund and in special cases the private sector	11% of the population	Contracts: 1 hospital
Private Health					
a) Owns and operates private clinics and hospitals for primary and curative care b) Owns and operates pharmacies	• Beneficiaries of any private health plan (self-insured) • Company employees and their dependants • All citizens willing to pay	• Direct out-of-pocket payments • Payments from insurance plans • Payments from employees and employers • Payments from Ministry of Health, CSC and other government agencies	Private hospitals and clinics by contract. Fee-for-service, or through a third-party payer (government, insurance company or employer)	All citizens with a willingness to pay are eligible. Persons referred by the Ministry of Health and other government agencies	• 147 hospitals with 10,387 beds (comprising 90% of all beds and 88% of all hospitals) • 1405 pharmacies and 3146 registered pharmacies • 110 primary health care centres and 734 dispensaries

Source: Lebanon National Health Accounts (2000).

Chapter 3

Defining and categorizing health expenditure

3.01. An early task in the development of a national health accounts (NHA) framework is to decide what types of activities to include and what types to exclude. According to *The world health report 2000 (1)*, a health system includes "all the activities whose primary purpose is to promote, restore or maintain health". Given that health is such an integral part of human life that anything done or not done affects it, dividing activities between "health" and "not health" can be difficult. Of the myriad transactions that take place in the economy, which are counted when measuring national health expenditure, and which are excluded? It is important to have consistent rules in making these decisions, in order to allow for greater cross-payer (and cross-country) comparability of health expenditure estimates, as well as for greater comparability over time within a country's accounts.

Setting the boundary of the national health accounts

3.02. For the purposes of NHA, the boundary is set as follows: national health expenditure encompasses all expenditures for activities whose primary purpose is to restore, improve and maintain health for the nation and for individuals during a defined period of time. This definition applies regardless of the type of the institution or entity providing or paying for the health activity.

3.03. The Organisation for Economic Co-operation and Development (OECD) has proposed a boundary more specifically focused on health care services in the system of health accounts (SHA) manual (p.42): "Activities of health care in a country comprises the sum of activities performed either by institutions or individuals pursuing, through the application of medical, paramedical, and nursing knowledge and technology, the goals of:

- promoting health and preventing disease;
- curing illness and reducing premature mortality;
- caring for persons affected by chronic illness who require nursing care;
- caring for persons with health-related impairment, disability, and handicaps who require nursing care;
- providing and administering public health;
- providing and administering health programmes, health insurance and other funding arrangements."

3.04. This *Guide* recognizes that many countries may legitimately wish to expand the boundary described in the SHA manual. In the SHA, health expenditures are restricted to activities based on "medical" technology. In this *Guide*, goods and services purchased from informal and possibly illegal health care providers, even those not medically qualified, can be allowed as appropriate for inclusion in the accounts. Similarly, purchases from traditional providers, who may not use Western or allopathic medical technology, may be included.

3.05. However one construes the criterion for establishing the boundary of the health accounts, it is frankly impossible to apply this criterion — or any criterion, for that matter — to each of the myriad transactions that take place in the economy. Consequently, health accountants rely on aggregations of transactions already sorted by other statistical authorities or on aggregating transactions that involve entities typically associated with "health". The "primary purpose" is inferred from the type of good or service purchased, or determined from the stated intention of the purchaser.

3.06. An important characteristic of activities included within the sphere defined above is the use of resources. If there is no use of resources, there is no transaction, and the activity is not measured in the health accounts. For example, the decision to stop smoking is clearly health-related. However, while medical goods and services consumed to help cessation are entered into the health accounts, the value

of the act of stopping itself is not. As another example, goods and services consumed by one family member to care for another family member are appropriately included with health spending, but the *unpaid* labour of that caregiver, in a treatment parallel to that used to measure the aggregate output of the economy, is *not* counted among health expenditures.

3.07. There is no clear line that distinguishes those activities that are "in" the health accounts sphere from those that are "out" (see Table 3.1). This ambiguity goes back to the notion that virtually all activity affects health in some way, and it is reflected in the unclear border between the health system and the social services system. For example, installation of basic public water and sanitation systems affects health, but construction of systems with the primary intent to distribute water falls outside the health boundary. In contrast, water treatment primarily designed to counteract disease can be considered inside the boundary. Another frequently encountered example involves the range of different food and nutrition activities implemented in many countries. These programmes include supplementary feeding programmes targeted at malnourished children who are brought to special facilities for that purpose, nutritional education and counselling to prevent malnutrition, general school lunch or lunch subsidy programmes, general subsidies for basic food items, and so on. These programmes may not be provided by the health ministry, but rather by other departments such as social welfare, agriculture, and education. The primary purpose criterion can help distinguish between those that should be included as health-related expenditures and those that should be excluded. If the primary purpose of the programme is health improvement, for example the targeted supplementary feeding programme that provides feeding as therapy to assist recovery from acute malnutrition, it should probably be included. However, when the primary purpose of the programme is general income support, for example generalized food subsidies for basic food items, it should probably not be included in the measurement of national health expenditure. This type of distinction is important to make in order to separate expenditures which many countries will want to include as health-related from those that, though perhaps generating some health benefits, take NHA analysis too far afield, making the results less useful for policy purposes.

Table 3.1 Examples of activities that might be included in or excluded from national health expenditure

Type of activity	Likely to be health-related	Unlikely to be health-related
Water supply and hygiene activities	Surveillance of drinking-water quality; construction of water protection whose primary purpose is to eliminate water borne disease	Construction and maintenance of large urban water supply systems whose primary purpose is access to water for the urban population
Nutritional support activities	Nutritional counselling and supplementary feeding programme to reduce children's malnutrition	General school lunch programmes and general subsidies for food prices, whose primary purposes is income support or security
Education and training	Medical education and in-service training for paramedical workers	Secondary school education received by future physicians or health workers
Research	Medical research; health services research to improve programme performance	Basic scientific research in biology and chemistry

3.08. To distinguish between the two types of activities (in and out), the health accountant must make a judgement, or must rely on the judgement of others in a position to assess the primary intent of the activity. Once such a judgement regarding treatment of the activity has been made, it is equally important (if not more important) to repeat that treatment for each year of the health accounts; including the activity one year and excluding it the next destroys the temporal consistency of the health accounts and makes it difficult to distinguish true trends in health spending.[3]

3.09. It is precarious to rely solely on the nature of the actor to determine whether or not an activity belongs inside the health accounts boundary. For example, hospitals may provide social counselling, or the ministry of health may provide occupational retraining (as opposed to occupational therapy). Such activity, while conducive to better health, does not have health as its primary intent and should be excluded from the health accounts.

3.10. Of course, in practice this exclusion may be difficult or impossible to carry out, as transactions related to "non-health" activities are intermingled with the "health" activities of the entity. Health accountants are urged to remain aware of the slip between theory and practice, but not to become mired in a hopeless chase after theoretical purity. If roughly the same magnitude of misclassification occurs each year, the resulting trends should remain reasonably free of distortion, and it is preferable to have a current and reasonably accurate measure of health expenditure in hand than to have a very accurate measure eternally just out of reach.

3.11. Decisions to include or exclude transactions are, in a sense, arbitrary. This is the nature of any classification. The goal of the health accountant is to be consistent in making such decisions, and to document those decisions thoroughly so that next year's accounts will be consistent with this year's accounts.

The space and time boundaries of national health accounts

3.12. In addition to a boundary stated in terms of the types of activities considered, NHA possess boundaries in terms of space and time. The accounts capture health expenditure for a country, but this measure is not limited to the activity that takes place within the national borders. Rather, it is defined in terms of the nation's citizens and residents. This means that the accounts include spending on health care by citizens and residents who are temporarily abroad, as well as spending of external agencies (such as bilateral aid agencies) on inputs to health care within that country. The accounts exclude spending in the country by foreign nationals — which is technically the "export" of health care. (In practice, this is difficult to do. However, in many low-income and middle-income countries it is not a large item, in which case failing to exclude "exports" of services does not seriously impair the accuracy of the accounts.)

3.13. The time boundary of the health accounts has two elements. First, a particular period must be chosen within which the activities took place. Most often this is a fiscal year or a calendar year. This choice may seem trivial, but in practice it can pose problems. For example, government entities may report spending on the basis of a fiscal year while private entities report on the basis of a calendar year. In such a case, the health accountant must adjust the figures reported so that only one time period is used. Examples of how this can be done are provided in Annex D.

3.14. The other element of the time boundary is the distinction between when the activity took place and when the transaction that paid for the activity took place. In practice, this involves a choice between accrual accounting and cash accounting. Health accounts should use the accrual method, in which

[3] During benchmark revisions of the health accounts — comprehensive revisions to take into account new data and new definitions — it is, however, appropriate to consider whether a particular activity should be added to or dropped from the NHA time series.

expenditures are attributed to the time period during which the economic value was created, rather than the cash method, in which expenditures are registered when the actual cash disbursements took place. For example, if a hospital stay occurs during the last month of the old fiscal year, but is paid for during the second month of the new fiscal year, it should be recorded as an expenditure in the old fiscal year. Health accountants will encounter a variety of accounting practices in their data sources, some accrual and others cash. Their job is to convert everything to an accrual basis, to the extent possible.[4]

Classifying health expenditures by their function

3.15. Because the boundary of the health accounts is defined in terms of the nature of the activity being performed, it is essential to have a sound way to categorize those activities by their nature. Such a scheme is found in OECD's International Classification for Health Accounts functional classification of health care (ICHA-HC) (see Table 3.2, page 28). The ICHA-HC categorizes the types of goods and services produced by health care providers and by institutions and actors engaged in related activities to health care. As such, it plays an important role not only as a basis for identifying transactions that lie inside the health accounts boundary but also as a basis for deciding which transactions contribute to the various specific aggregate measures of "health expenditure".

3.16. In this classification schedule, greater levels of detail are associated with extended codes. Thus, "medical goods dispensed to outpatients" (HC.5) comprises "pharmaceuticals and other medical non-durables" (HC.5.1) and "therapeutic appliances and other medical durables" (HC.5.2); in turn, "pharmaceuticals and other medical nondurables" (HC.5.1) comprises "prescribed medicines" (HC.5.1.1), "over-the-counter medicines" (HC.5.1.2), and "other medical nondurables" (HC 5.1.3).

3.17. Several points are worth considering as health accountants implement the ICHA-HC schedule. First, the scheme is very detailed and specific, and few countries have information on all of the categories listed. Therefore, it will often be the case that as a practical matter the number of categories is limited to those that are relevant and feasible. Second, although for display purposes the accounts may only show detail at the 2-digit level, it is advisable to keep as much detail as possible in the working tables (a point that will be explored in more depth later in the *Guide*).

3.18. The category "prevention and public health services" (HC.6) is of special interest to many countries, and it may be very useful to expand that classification schedule into further detail. For example, national teams may want to separate control efforts for specific diseases such as HIV/AIDS or tuberculosis, under "prevention of communicable diseases" (HC.6.3) and "prevention of noncommunicable diseases" (HC.6.4). Often this can be done by adding subcategories — provided that information available to the team can support the required breakdown into subcategories. The postscript to this chapter contains examples of classification schedules for public health activity used in Sri Lanka and in Malaysia, as well as a schedule developed along the lines of essential public health functions.

3.19. The ICHA-HC classification scheme separates those functions that directly involve current health care from those that are related to the health infrastructure. Fixed capital formation for health care provider institutions (HC.R.1) is used to build (or rebuild) the physical facilities of hospitals and other providers of care. Fixed capital investments for institutions performing health-related functions, such as construction and equipping of research and training facilities, should be included in HC.R.2 to HC.R.5. If there is interest in showing these capital expenditures separately, they can be presented as subcategories under each related higher-level category.

[4] For policy analysis purposes it may also be appropriate to maintain a set of "cash basis" accounts for comparison with outlay figures produced by the ministry of finance.

3.20. In theory the ICHA-HC categories completely partition activities of health, but in practice many transactions will be known to be within the health accounts boundary but will not be clearly identifiable by function. This gap between theory and practice can be bridged by the introduction of a "not specified by kind" category shown in Table 3.2 as HC.nsk and HC.R.nsk.

Establishing aggregate measures of national health expenditure

3.21. Although policy-makers want and need fairly detailed information about the various health care functions financed in their country, they also want and need a summary figure. This summary figure provides a snapshot view of the size and growth of the health system. It also provides a context for thinking about the detailed categories of spending. Therefore, it is important to define the aggregate measure rather carefully.

3.22. In its SHA manual, OECD has proposed three measures of health spending for use in international comparisons:

- *Total expenditure on personal health care*. This is the sum of expenditures classified under categories HC.1 to HC.5 and covers spending for goods and services directed at the care of specific individuals (as distinct from collective health or public health services).
- *Total current expenditure on health* (TCHE). This measure is the sum of expenditures classified under categories HC.1 to HC.7. Thus, it includes the spending for personal health care defined above, plus spending for collective health services and for the operation of the system's financing agents.
- *Total expenditure on health* (THE). This aggregate includes TCHE plus capital formation by health care provider institutions (HC.R.1).

3.23. In addition to TCHE and THE, the SHA manual encourages countries to estimate the other elements of health-related expenditure (categories HC.R.2 to HC.R.7) and to report these as "memorandum items".

3.24. International experience suggests that countries differ in what their policy-makers consider to be total health expenditure. For national policy purposes, some countries may want to estimate total health spending inclusive of some health-related activities in addition to capital investment. Activities such as medical education and health-related professional training, health-related research, and health-related nutritional or environmental programmes may be seen as integral parts of the health system that should be included in national estimates of total health expenditure.

3.25. As with the classification schedule for functions, this *Guide* encourages health accountants to do two things. First, they should establish an aggregate measure that best addresses the needs and concerns of national policy-makers. This aggregate may be TCHE or THE, or it may include any of the health-related functions in the ICHA-HC classification or the national variant of that classification, as long as the measure itself is consistent over time, well defined, and explained to users of the accounts. This aggregate can be called national health expenditure (NHE) or whatever other name conveys the sense of the measure. Second, the NHA should be constructed in such as way that TCHE and THE can be calculated for the purposes of international comparison. (In the remainder of this *Guide*, the term "national health expenditure" will be used to refer to the aggregate chosen).

Summary

3.26. Like any model, NHA are a construct. Their structure can be anything, but in order to be useful that structure must be able to address the policy needs of a country's decision-makers, including the need to compare the country's experience with that of other nations.

3.27. This chapter has developed the beginnings of a framework. The overall boundary of the health accounts is set in terms of the intended functions of activities in the economy. Those activities intended to improve health, change health-related behaviour, or change the systems performing or financing that activity are included. The job of operationalizing this boundary falls to the country's health accountants and their policy audience, and the success of that operationalization depends on the quality of the judgement exercised.

3.28. To health accountants also falls the task of placing a value on the activities included in the health accounts. In some cases this can be done by capturing the market value of the transactions that occur. In others it requires that the "market" value be estimated from the value of the resources used to produce goods or services. In either case, care must be taken to measure the value of transactions and activities in the same way as they are measured in other economic reporting systems.

3.29. NHA analysts should seek input from policy-makers concerning their views of how to handle health-related expenditures for national analytical purposes. Health accounts should provide policy-makers with the information they want and need for national purposes. Rigorous development of a classification scheme based on the ICHA-HC categories and a judicious choice of one or more aggregate measures of health spending will ensure that these needs are met, at the same time providing figures that can be used for international reporting and comparison.

3.30. Chapter 4 is devoted to a discussion of how to categorize the other dimensions of health expenditure in practical and useful ways.

Postscript: Classification schemes for prevention and public health services

3.31. More than for any other category, national health accountants are likely to find a need to modify the ICHA-HC classification categories for prevention and public health services. Not only do these functions tend to be a relatively large and important part of the health system in low-income and middle-income economies and thus a natural focus of policy-makers, they also tend to be the most dissimilar of the functions in terms of their organization across national borders.

3.32. In this postscript, three classification schemes are shown for prevention and public health — two taken from actual country experience and one hypothetical one. The purpose of showing these is not to recommend one or the other, nor to suggest that the IHCA-HC categories are not useful. Rather, the purpose is to highlight the ways in which health accountants have adapted (or could adapt) international classification schedules for national purposes. The three cases are presented in increasing degree of divergence from the ICHA-HC schedule.

Sri Lanka

3.33. Directors of the Sri Lanka national health accounts (SLNHA) convened a special working group to adapt the ICHA-HC for use in SLNHA. The group brought together representatives of the Ministry of Health, Institute of Policy Studies (IPS), United Nations Children's Fund (UNICEF) and United Nations Population Fund (UNFPA), in order to ensure interagency consensus on the categories chosen. The SLNHA

definitions for the functional classification of preventive and public health services expenditures are shown in Table 3.3 (see pages 29–31). With the exception of subcategories added to F6.1 and F6.3, the classification schedule mirrors the ICHA-HC. There is a clear crosswalk between the SLNHA categories and the ICHA-HC categories.

3.34. As part of the consensus-building process, explicit documentation for the categories was developed. For example, the group noted that vaccinations that are part of a public health campaign but that are performed in connection with some other health provider contact are included with that other contact rather than separately in F6.

Malaysia

3.35. The Malaysia national health accounts (MNHA) use a classification scheme for "core functions of medical care" that includes a category for prevention and public health services, shown in Table 3.4.

Table 3.4 Malaysia national health accounts (MNHA): classification of prevention and public health services as core functions of medical care

MNHA code	MNHA description	ICHA-HC code
1.6	Prevention and public health services	HC.6 + HC.R.4
1.6.1	Maternal and child health, family planning and counselling	HC.6.1
1.6.2	School health services	HC.6.2
1.6.2.1	Medical	
1.6.2.2	Dental	
1.6.3	Prevention of communicable disease	HC.6.3 (part)
1.6.3.1	HIV/AIDS	
1.6.3.2	Vector-borne diseases	
1.6.3.3	Other	
1.6.4	Prevention of noncommunicable disease	HC.6.4 (part)
1.6.5	Health education	
1.6.5.1	Communicable disease control	HC.6.3 (part)
1.6.5.2	Noncommunicable disease prevention	HC.6.4 (part)
1.6.6	Food hygiene and drinking-water control	HC.R.4
1.6.7	Other not explicitly classified	HC.6.9

3.36. This example shows two different types of decisions regarding the ICHA-HC categories. First, Malaysian public education campaigns regarding disease are important to decision-makers, so the health accountants separated those activities from the other disease prevention activities and assigned them their own code. Second, food hygiene and drinking-water control were seen as an essential part of public health activity; activities that would be classified as health-related under ICHA-HC.R.4 were assigned a code within the prevention and public health services subtotal.

3.37. Despite the national adaptation of the functional classification of health activities, however, Malaysian health accountants will still be able to construct the MNHA along the lines of the "standard" ICHA-HC for the purposes of international comparison and reporting.

Essential public health functions

3.38. A third example of a classification schedule for public health functions is based on early work on essential public health functions (EPHF) *(3)*. This particular categorization has not been endorsed by any international organization nor adopted by any country, but it does serve a useful didactic purpose and was crosswalked to the IHCA-HC scheme in Annex 9.3 of the OECD SHA manual. It is reproduced with some amendments in Table 3.5 (see pages 32 and 33).

3.39. The scheme in Table 3.5 shows how the boundary of the health accounts can be expanded from that proposed in Chapter 3 of this *Guide*. Control of hazardous substances (part of EPHF 5) and organization of emergency disaster services (part of EPHF 8) lie outside the Chapter 3 boundary and are not included in any ICHA-HC category. A conscious decision to include them within the boundary is perfectly acceptable from the standpoint of national policy analysis; however, for the purposes of international comparison and reporting, this expansion should be well documented and, to the extent possible, data should be collected and tabulated in a way that allow these two sets of activities to be reported separately.

3.40. The case also shows how a classification schedule can cross several ICHA-HC category lines. Adoption of a classification schedule such as that shown in Table 3.5 would likely result in health accountants having difficulty reporting their country's expenditures under the ICHA-HC scheme. (By the same token, those same health accountants would likely have great difficulty employing the ICHA-HC categories in any case, because of the way in which public health is structured and reported in the country.) In such a case the international comparability of the health accounts would be limited to those activities reported under HC.1 to HC.5 plus a combination of HC.6 and HC.7. This is not necessarily a fatal flaw in the structure of the health accounts: national utility takes precedence over international comparability. However, the health accountants in the country would have to make sure that policy-makers were aware of the limited comparability of the results.

Table 3.2 International Classification for Health Accounts scheme for health care functions (ICHA-HC)

ICHA code	Description
HC.1	**Services of curative care**
HC.1.1	Inpatient curative care
HC.1.2	Day cases of curative care
HC.1.3	Outpatient curative care
HC.1.3.1	Basic medical and diagnostic services
HC.1.3.2	Outpatient dental care
HC.1.3.3	All other specialized medical services
HC.1.3.4	All other outpatient curative care
HC.1.4	Services of curative home care
HC.2	**Services of rehabilitative care**
HC.2.1	Inpatient rehabilitative care
HC.2.2	Day cases of rehabilitative care
HC.2.3	Outpatient rehabilitative care
HC.2.4	Services of rehabilitative home care
HC.3	**Services of long-term nursing care**
HC.3.1	Inpatient long-term nursing care
HC.3.2	Day cases of long-term nursing care
HC.3.3	Long-term nursing care: home care
HC.4	**Ancillary services to medical care**
HC.4.1	Clinical laboratory
HC.4.2	Diagnostic imaging
HC.4.3	Patient transport and emergency rescue
HC.4.9	All other miscellaneous ancillary services
HC.5	**Medical goods dispensed to outpatients**
HC.5.1	Pharmaceuticals and other medical nondurables
HC.5.1.1	Prescribed medicines
HC.5.1.2	Over-the-counter medicines
HC 5.1.3	Other medical nondurables
HC.5.2	Therapeutic appliances and other medical durables
HC.5.2.1	Glasses and other vision products
HC.5.2.2	Orthopaedic appliances and other prosthetics
HC.5.2.3	Hearing aids
HC.5.2.4	Medico-technical devices, including wheelchairs
HC.5.2.9	All other miscellaneous medical goods
HC.6	**Prevention and public health services**
HC.6.1	Maternal and child health; family planning and counselling
HC.6.2	School health services
HC.6.3	Prevention of communicable diseases
HC.6.4	Prevention of noncommunicable diseases
HC.6.5	Occupational health care
HC.6.9	All other miscellaneous public health services
HC.7	**Health administration and health insurance**
HC.7.1	General government administration of health
HC.7.1.1	General government administration of health (except social security)
HC.7.1.2	Administration, operation and support of social security funds
HC.7.2	Health administration and health insurance: private
HC.7.2.1	Health administration and health insurance: social insurance
HC.7.2.2	Health administration and health insurance: other private
HC.nsk	*HC expenditure not specified by kind*
HC.R.1–5	**Health-related functions**
HC.R.1	Capital formation for health care provider institutions
HC.R.2	Education and training of health personnel
HC.R.3	Research and development in health
HC.R.4	Food, hygiene and drinking-water control
HC.R.5	Environmental health
HC.R.nsk	*HC.R expenditure not specified by kind*

Note: Entries in italics are extensions to or expansions of the schedule in the OECD system of health accounts (SHA) version 1.0 manual.

Table 3.3 Sri Lanka national health accounts (SLNHA): definitions for the functional classification of preventive and public health services expenditures

SLNHA code	Category title	SLNHA category description	ICHA-HC code
F6	Preventive and public health services	This category includes expenditures on services specifically intended to enhance the health status of the population or specific population subgroups, as distinct from the personal medical services, which repair health dysfunction. Many of these expenditures on these services may be provided in an integrated fashion by general medical institutions as part of their normal activities. These expenditures are not accounted for here, although SLNHA does provide disaggregations of the relevant expenditures, where feasible. Typical examples are vaccination services, campaigns and special reproductive health programmes. Note that many of these items may be grouped to form categories relevant to other classifications. In particular, these can be identified or defined: 1. Safe motherhood services, as defined by some authorities, consist of maternal health (F6.1.1) 2. Maternal and child health, also termed family health, consists of maternal health, well-baby, infant and child care, and family planning services (F6.1.1–F6.1.3). 3. Reproductive health services consist of maternal health and family planning health services (F6.1.1, F6.1.3, F6.1.4). 4. Childbirth services are accounted for separately under personal curative services (F1).	HC.6
F6.1	Family health and reproductive health services	This covers a wide range of services, which comprise significant elements in what is also known as reproductive health care, maternal and child health services, and family health.	HC.6.1
F6.1.1	Maternal health	Maternal health services include all special programmes designed to provide antenatal and postnatal care to mothers, including provision of dietary supplements for malnourished pregnant and lactating mothers, such as micronutrients, and iron and vitamins (Thriposhaya).	
F6.1.2	Infant and child care	This covers special services intended to promote and improve the health and development of infants and preschool children. It includes well-baby health care, growth monitoring and growth promotion of infants and pre school children, and provision of dietary supplements such as Thriposhaya and micronutrients.	

Table 3.3 Sri Lankan national health accounts (SLNHA): definitions for the functional classification of preventive and public health services expenditures (continued)

SLNHA code	Category title	SLNHA category description	ICHA-HC code
F6.1.3	Family planning services	This consists of programmes specifically intended to provide delivery of family planning methods and counselling, and health education in support of such services.	
F6.1.4	Other reproductive health services	This consists of other categories of reproductive health services not classified above and intended to enable both women and men to exercise safely their reproductive health functions. They include services dealing with sub-fertility, sexual behaviour, adolescent health, treatment and prevention of reproductive tract infections and conditions, including cancers of the reproductive system, menopausal problems, and genetic counselling services for the prevention of specific congenital abnormalities. Programmes dealing primarily with sexually transmitted diseases are excluded and are classified elsewhere.	
F6.2	School health services	This consists of special programmes and services intended to promote and maintain the health of children at school. These services are generally delivered within school premises.	HC.6.2
F6.3	Prevention and management of communicable disease	This category includes: compulsory reporting/notification of certain communicable diseases and epidemiological enquiry of communicable disease; efforts to trace possible contacts and origin of disease; prevention and management of tuberculosis and leprosy, and tuberculosis and leprosy control (including systematic screening of high risk groups); immunization/vaccination programmes (compulsory and voluntary); vaccination under maternity and child health care. It excludes: vaccination for occupational health; vaccination for travel and tourism on the patient's own initiative; and environmental health services intended to maintain food safety and hygiene.	HC.6.3
F6.3.1	Immunization	This includes special programmes to provide immunization/ vaccination services, including immunizations provided as part of routine maternal and child health care, and rubella immunization of girls and women. Where immunization services are delivered using existing infrastructure of other services, such as the maternal and child health (MCH) services, only the marginal costs represented are accounted here.	
F6.3.2	STDs	This includes special programmes to control, treat and manage sexually transmitted diseases (STDs), including HIV/AIDS.	

Table 3.3 Sri Lankan national health accounts (SLNHA): definitions for the functional classification of preventive and public health services expenditures (continued)

SLNHA code	Category title	SLNHA category description	ICHA-HC code
F6.3.9	Others not elsewhere classified	This includes services not explicitly classified above. This category comprises public health services of health education, disease prevention, and the promotion of healthy living conditions and lifestyles, directed towards noncommunicable diseases and conditions. It includes services such as those provided by centres for disease surveillance and control, programmes for the avoidance of risks incurred through injurious behaviour, and programmes for the general improvement of the health status of the population.	HC.6.4
F6.4	Prevention and management of noncommunicable disease	This category includes: interventions against smoking, alcohol and substance abuse such as anti-smoking campaigns; activities of community workers; services provided by self-help groups; general health education and health information of the public; health education campaigns; and campaigns in favour of healthier lifestyles; and information exchanges, e.g. relating to alcoholism, drug addiction. Excludes: public health environmental surveillance and public information on environmental conditions.	
F6.5	Occupational health care	Occupational health care consists of health services provided to individuals or population groups in their capacity as employees and workers. They comprise a wide variety of health services such as surveillance of employee health (routine medical check-ups) and therapeutic care (including emergency medical services), provided on or off business premises. No distinction is made as to the sector of employment, including government and non-profit institutions serving households. This excludes, however, remuneration-in-kind of health services and goods, which constitute household actual final consumption rather than intermediate consumption of business.	HC.6.5
F6.9	All other public health services not elsewhere classified	This item comprises a variety of miscellaneous public health services such as operation and administration of blood banks and organ banks, and the preparation and dissemination of information on public health matters not classified elsewhere. It includes public health environmental surveillance and public information on environmental conditions.	HC.6.9

Table 3.5 Classification based on essential public health functions (EPHF)

EPHF description	ICHA-HC
1. Prevention, surveillance and control of communicable and noncommunicable diseases	
Immunization	HC.6.3
Disease outbreak control	HC.6.3
Disease surveillance	cross-funct. (HC.6. and HC.7.)
Prevention of injury	HC.6.4 (and cross-funct.)
2. Monitoring the health situation	
Monitoring of morbidity and mortality	cross-funct. (HC.6. and HC.7.)
Evaluation of the effectiveness of promotion, prevention and services programmes	cross-funct. (HC.6. and HC.7.)
Assessment of the effectiveness of public health functions	HC.6. and HC.7.
Assessment of population needs and risks to determine which subgroups require services	cross-funct. (HC.6. and HC.7.)
3. Health promotion	
Promotion of community involvement in health	HC.6.9 and HC.7.
Provision of information and education for health and life skill enhancement in school, home, work and community settings	cross-funct. (HC.6. and HC.7.)
Maintenance of linkages with politicians, other sectors and the community in support of health promotion and public health advocacy	strategic aspect
4. Occupational health	(HC.6.5)
Setting occupational health and safety standards	HC.7.
5. Protecting the environment	
Production and protection of, and access to, safe water	(HC.R.4)
Control of food quality and safety	HC.R.4
Provision of adequate drainage, sewerage and solid waste disposal services	HC.R.4
Control of hazardous substances and wastes	none
Provision of adequate vector control measures	HC.6.3
Ensuring protection of water and soil resources	(HC.R.5)
Ensuring environmental health aspects are addressed in development policies, plans, programmes and projects	strategic aspect
Prevention and control of atmospheric pollution	(HC.R.5)
Ensuring adequate prevention and promoting environmental services	strategic aspect
Ensuring adequate inspection, monitoring and control of environmental hazards	strategic aspect
Controlling radiation	HC.R.5
6. Public health legislation and regulations	
Reviewing, formulating and enacting health legislation, regulations and administrative procedures	HC.6.
Ensuring adequate legislation to protect environmental health	cross-funct. (HC.1. - HC.4.)
Health inspection and licensing	HC.6.
Enforcement of health legislation, regulations and administrative procedures	cross-sectoral

Table 3.5 Classification based on essential public health functions (EPHF) (continued)

EPHF description	ICHA-HC
7. Public health management	
Ensuring health policy, planning and management	HC.6.1 (and cross-sectoral)
Use of scientific evidence in the formulation and implementation of public health policy	strategic aspect
Public health and health systems research	HC.R.3
International collaboration and cooperation in health	HC.6.1 (and cross-sectoral)
8. Specific public health services	
School health services	HC.6.2
Emergency disaster services	none
Public health laboratory services	HC.6.3
9. Personal health care for vulnerable and high-risk populations	cross-funct. issue
Maternal health care and family planning	HC.6.1
Infant and child care	HC.6.1

Note: cross-funct.: cross-functional issue.

Source: Adapted from OECD *A system of health accounts*, Annex 9.3.

Chapter 4

Classifying entities in the health care system

4.01. In the previous chapter, the OECD International Classification for Health Accounts functional classification of health care (ICHA-HC) was introduced as a way to group activities and transactions in the health accounts by the nature of those activities and transactions. In this chapter, schemes from the ICHA (and from other sources) are introduced as ways to categorize the various actors in the health care system — financing agents, providers, financing sources, and beneficiaries — and the resources used to generate the goods and services provided.

4.02. As mentioned in paragraph 1.19, the categories in any classification scheme need to be mutually exclusive and exhaustive. Mutual exclusivity means that each transaction (or other unit being analysed) *cannot* go into more than one category. Exhaustiveness means that each and every transaction *can* go into one category. Together, they mean that each transaction goes into exactly one category. These two characteristics of classification schemes are critical to the success of the health accounts. Schemes that are not exhaustive subject the accounts to gaps in their coverage of national health expenditure. Schemes that are not mutually exclusive subject the accounts to overestimates of spending where transactions or activities are counted twice. While exhaustiveness is fairly easily identified in a scheme, violation of the mutual exclusivity condition can be quite subtle. Typically it arises where two or more attributes of health spending are combined, such as a mix of provider types and function types. Or it can arise where the unit of analysis can possess multiple values of the attribute, such as diagnoses attached to a medical encounter. Health accountants must take great pains to make sure that their classification schedules (or decision rules) exhibit mutual exclusivity and exhaustiveness.

Classifying financing agents

4.03. The classification scheme for financing agents allows the accountant to categorize the institutions and entities that pay for or purchase health care. Financing agents include institutions that pool health resources collected from different sources, as well as entities (such as households and firms) that pay directly for health care from their own resources. Health accountants using the OECD system of health accounts (SHA) manual will note that this set of actors is called "sources of funding". The term "financing agent" is used in this *Guide* to emphasize the role of these actors as poolers and distributors of money; "financing sources" (described below) is a term used for the entities that provide money to financing agents to be pooled and distributed.

4.04. The classification scheme advocated in this *Guide* is based on the ICHA-HF (shown in Table 4.1) although it incorporates some extensions. As with the functional classification scheme in the ICHA, NHA will likely show policy-relevant subcategories of financing agents under many of the two-digit headings of the ICHA-HF. For example,

Table 4.1 OECD International Classification for Health Accounts classification scheme for financing agents (ICHA-HF)

ICHA-HF code	Description
HF.1	General government
HF.1.1	Territorial government
HF.1.1.1	Central government
HF.1.1.2	State/provincial government
HF.1.1.3	Local/municipal government
HF.1.2.	Social security funds
HF.2	Private sector
HF.2.1	Private social insurance
HF.2.2	Other private insurance
HF.2.3	Private households' out-of-pocket payment
HF.2.4	Non-profit institutions serving house holds (other than social insurance)
HF.2.5	Private firms and corporations (other than health insurance)
HF.3	Rest of the world

under central government (HF.1.1.1), countries probably will add additional categories for the ministry of health, ministry of education, other ministries, and so on (this is demonstrated in Chapter 9). Similarly, where there are multiple social security funds, it would be appropriate to add subcategories under HF.1.2 for the different major funds. The health accounts for Mexico, for example, show each one of the major health insurance schemes as a separate subcategory because the government is interested in tracking their expenditures separately.

4.05. A similar treatment of household out-of-pocket payments (HF.2.3) may also be in order. Experience in middle-income and low-income countries has shown that this category often accounts for more than half of total estimated expenditure. Analysts may want to disaggregate this item further to distinguish between cost-sharing at government facilities, co-payments and deductibles under health insurance schemes, and fee-for-service payments for treatment, pharmaceuticals, and other inputs. This can be done with appropriate 3-digit subcategories.[5]

4.06. In health accounting (and other forms of social accounting), insurance schemes fall into one of three groups. Social security schemes (HF.1.2) are those required by law or regulation[6]*(4).* Social insurance schemes (HF.2.1) are those where enrolment is restricted to subsets of the population; typically, to be covered one must be an employee (or retiree) of a sponsoring firm or a member of a sponsoring trade union or association, or a family member of such a person. Other private health insurance (HF.2.2), often called voluntary medical insurance, is potentially available to any member of society (although often there are physical or medical conditions for enrolment).

4.07. The ICHA-HF scheme follows the system of national accounts (SNA) in its classification of financing agents. In the SNA and in the SHA, activities in which governments act in a fashion similar to private firms are classified as private activities. Thus, health insurance programmes for government employees are counted as private social insurance, and parastatal firms[7] are classified as private firms if they have a significant degree of autonomy from general government operations.

[5] Technically, this treatment combines elements of the financing agent and provider type, but it is an acceptable breakdown within HF.2.3 because the categories are mutually exclusive and exhaustive.

[6] The SNA93 (United Nations Statistical Division, the International Monetary Fund, the World Bank, Eurostat and the Organisation for Economic Co-operation and Development 1993) describes social security schemes thus: "4.111. Social security funds constitute special kinds of institutional units which may be found at any level of government — central, state or local. Before defining social security funds, it is necessary to give a brief description of social insurance schemes in general. Social insurance schemes are intended to provide social benefits to members of the community, or to groups of individuals such as the employees of an enterprise and their dependants, out of funds derived mainly from social contributions. Social security schemes are social insurance schemes covering the community as a whole or large sections of the community that are imposed and controlled by government units. They generally involve compulsory contributions by employees or employers or both, and the terms on which benefits are paid to recipients are determined by government units. The schemes cover a wide variety of programmes, providing benefits in cash or in kind for old age, invalidity or death, survivors, sickness and maternity, work injury, unemployment, family allowance, health care, etc. There is usually no direct link between the amount of the contribution paid by an individual and the risk to which that individual is exposed. Social security schemes have to be distinguished from pension schemes or other social insurance schemes which are determined by mutual agreement between individual employers and their employees, the benefits being linked to contributions.

"4.112. Social security funds may be distinguished by the fact that they are separately organized from the other activities of government units and hold their assets and liabilities separately from the latter. They are separate institutional units because they are autonomous funds, they have their own assets and liabilities and engage in financial transactions on their own account. However, institutional arrangements in respect of social security differ from country to country and in some countries they may become so closely integrated with the other finances of government as to bring into question whether they should be treated as a separate sub-sector. The amounts raised, and paid out, in social security contributions and benefits may be deliberately varied in order to achieve objectives of government policy that have no direct connection with the concept of social security as a scheme to provide social benefits to members of the community. They may be raised or lowered in order to influence the level of aggregate demand in the economy, for example. Nevertheless, so long as they remain separately constituted funds they must be treated as separate institutional units in the System". See also paragraphs 11.4 and following in the OECD system of health accounts (SHA) manual.

[7] Parastatal firms are those entities that operate as though they were private sector firms but which are controlled by the government. In the SNA93 these are referred to as "quasi-corporations" (see paragraphs 4.106–4.110 in SNA93).

4.08. This may not, however, always be the way in which national policy is formulated. The health-related activities of government insurance funds or of parastatal firms may be seen as significant policy tools of the government, and as such policy-makers may wish to have them included with other government spending for health. Further, state-owned railways, oil companies, and airlines sometimes operate at a loss (including the cost of their health care activities) that shows up on the government budget as an expenditure.

4.09. To address a potential need for this reorganization of financing agents within a country's health accounts without departing from the SHA/SNA convention for classifying government employee insurance and parastatal firms' activities, this *Guide* introduces the concept of a public sector (HF.A) and nonpublic sector (HF.B) to the ICHA-HF scheme (see Table 4.2). This is a suggestion only; if the SHA/SNA treatment of government activities described above is not a policy issue there is no need to adopt this modification. Where it is a policy issue, the following steps are taken. First, government employee health insurance schemes are assigned to subcategory HF.2.1.1 and private employee insurance schemes are assigned to subcategory HF.2.1.2. Second, parastatal firms are assigned to subcategory HF.2.5.1 and private firms are assigned to subcategory HF.2.5.2. Third, the public sector is generated by combining total government (HF.1) with HF.2.1.1 and HF.2.5.1; the nonpublic sector is generated by subtracting HF.2.1.1 and HF.2.5.1 from the private sector (HF.2). Following these steps allows policy-makers to look at all government activities combined; at the same time, it allows those interested in comparing the health accounts with the national income accounts for the country or with results from other countries to see figures in the SHA/SNA configuration. The practice is simple to implement, assuming that records are available separately for government employee insurance and for the operations of parastatal firms.

Table 4.2 Classification scheme for financing agents based on the OECD International Classification for Health Accounts classification scheme for financing agents (ICHA-HF)

Code	Description
HF.A	*Public sector*
HF.1.1	Territorial government
HF.1.1.1	Central government
HF.1.1.2	State/provincial government
HF.1.1.3	Local/municipal government
HF.1.2.	Social security funds
HF.2.1.1	*Government employee insurance programmes*
HF.2.5.1	*Parastatal companies*
HF.B	*Nonpublic sector*
HF.2.1.2	*Private employer insurance programmes*
HF.2.2	Private insurance enterprises (other than social insurance)
HF.2.3	Private households' out-of-pocket payment
HF.2.4	Non-profit institutions serving households (other than social insurance)
HF.2.5.2	*Private nonparastatal firms and corporations (other than health insurance)*
HF.3	Rest of the world

Note: Entries in italics are extensions to or expansions of the ICHA-HF schedule in the SHA version 1.0 manual.

Classifying health care providers

4.10. This *Guide* recommends that the dimension of a nation's health accounts that describes the entities that engage in the production of the goods, services, or activities that fall within the health accounts boundary be described using an extension of the OECD ICHA-HP classification scheme. This scheme is shown in Table 4.3.

Table 4.3 Classification scheme for providers based on the OECD International Classification for Health Accounts classification scheme for providers (ICHA-HP)

Code	Description
HP.1	Hospitals
HP.1.1	General hospitals
HP.1.2	Mental health and substance abuse hospitals
HP.1.3	Specialty (other than mental health and substance abuse) hospitals
HP.1.4	*Hospitals of non-allopathic systems of medicine (such as Chinese, Ayurveda, etc.)*
HP.2	Nursing and residential care facilities
HP.2.1	Nursing care facilities
HP.2.2	Residential mental retardation, mental health and substance abuse facilities
HP.2.3	Community care facilities for the elderly
HP.2.9	All other residential care facilities
HP.3	Providers of ambulatory health care
HP.3.1	Offices of physicians
HP.3.2	Offices of dentists
HP.3.3	Offices of other health practitioners
HP.3.4	Outpatient care centres
HP.3.4.1	Family planning centres
HP.3.4.2	Outpatient mental health and substance abuse centres
HP.3.4.3	Free-standing ambulatory surgery centres
HP.3.4.4	Dialysis care centres
HP.3.4.5	All other outpatient multi-specialty and cooperative service centres
HP.3.4.9	All other outpatient community and other integrated care centres
HP.3.5	Medical and diagnostic laboratories
HP.3.6	Providers of home health care services
HP.3.9	Other providers of ambulatory health care
HP.3.9.1	Ambulance services
HP.3.9.2	Blood and organ banks
HP.3.9.3	*Alternative or traditional practitioners*
HP.3.9.9	All other ambulatory health care services
HP.4	Retail sale and other providers of medical goods
HP.4.1	Dispensing chemists
HP.4.2	Retail sale and other suppliers of optical glasses and other vision products
HP.4.3	Retail sale and other suppliers of hearing aids
HP.4.4	Retail sale and other suppliers of medical appliances (other than optical glasses and hearing aids)
HP.4.9	All other miscellaneous sale and other suppliers of pharmaceuticals and medical goods
HP.5	Provision and administration of public health programmes

Table 4.3 Classification scheme for providers based on the OECD International Classification for Health Accounts classification scheme for providers (ICHA-HP) (continued)

Code	Description
HP.6	General health administration and insurance
HP.6.1	Government administration of health
HP.6.2	Social security funds
HP.6.3	Other social insurance
HP.6.4	Other (private) insurance
HP.6.9	All other providers of health administration
HP.7	All other industries (rest of the economy)
HP.7.1	Establishments as providers of occupational health care services
HP.7.2	Private households as providers of home care
HP.7.3	All other industries as secondary producers of health care
HP.8	*Institutions providing health-related services*
HP.8.1	*Research institutions*
HP 8.2	*Education and training institutions*
HP.8.3	*Other institutions providing health-related services*
HP.9	Rest of the world
HP.nsk	*Provider not specified by kind*

Note: Entries in italics are extensions to or expansions of the ICHA-HP schedule in the SHA version 1.0 manual.

4.11. The distinction between the service provided and the entity that provides it is very important and is sometimes the source of some confusion. Health care services can often be provided in a wide range of settings. For example, outpatient treatment of an acute episode of a common infectious disease (such as malaria) may occur in clinics of community-based paramedical workers, in district-level health centres, in the offices of private physicians or in hospital outpatient departments. In this case, the type of service does not coincide with one specific type of provider. Using both the HC (see Table 3.2) and HP (see Table 4.3) classifications to develop NHA tables adds substantial richness to health expenditure information.

4.12. Subcategorizing providers within the ICHA-HP by type of ownership may be very useful for policy purposes related to the financing of public and private health care. For example, decision-makers might be interested in seeing whether regional hospitals are replacing ministry of health hospitals as a locus of care, or they might be interested in the growth in the numbers of private-sector physicians relative to public-sector physicians. Health accountants can inform this debate by developing ownership subcategories that separate provider groups of interest. For example, the category for general hospitals (HP.1.1) could be subdivided as shown in Table 4.4. A similar type of subcategorization can be applied to other providers as needed and relevant for policy.

Table 4.4 Example of possible subcategorization of the general hospitals (HP.1.1) category

Code	Description
HP.1.1	General hospitals
HP.1.1.1	Government-owned general hospitals
HP.1.1.1.1	General hospitals owned by central government
HP.1.1.1.2	General hospitals owned by regional and local government
HP.1.1.2	General hospitals owned by social insurance
HP.1.1.3	General hospitals owned by private-for-profit entities
HP.1.1.4	General hospitals owned by private non-profit entities

4.13. Not all of the ICHA-HP categories are of use in the NHA of any given country, and others may require greater detail. For example, there may be few nursing and residential care facilities (HP.2) or those facilities may be integrated with hospitals. In contrast, there may be a greater variety of outpatient community centres and other integrated care centres (HP.3.4.9) that would be of interest to assess in greater detail, such as those owned by non-profit organizations, government, and others. In cases like this, health accountants can collapse and combine categories not deemed relevant for national policy purposes, omit those for which there are no providers in the country (although it is useful to note this absence in the explanatory material that accompanies the tables), or add additional subcategories to an existing HP category. If this is done, care should be exercised to retain the numbering and sequencing of the ICHA scheme or to develop a crosswalk between the national classification scheme and the ICHA-HP, for international comparison purposes.

4.14. The ICHA-HP must be extended to the extent that the health accounts include traditional forms of medicine (see paragraph 3.04). Suggested extensions are shown in Table 4.3 in italics. Again, if the category of provider does not exist in a country or if a decision has been made to exclude the services typically rendered by such providers, the new categories need not be used. If the providers do exist and are to be counted but data do not show them separately, it is perfectly acceptable to include them in the "residual" category HP.x.9 (for example HP.1.9 or HP.3.9).

4.15. A category has been added for hospitals of non-allopathic systems of medicine (HP.1.4). These are important categories of providers in some countries, especially in South and East Asia. This category is introduced to capture expenditures for hospitals of medical systems such as Ayurveda or traditional Chinese medicine, which are not part of the regular allopathic systems of hospitals.

4.16. A category has also been added to the ICHA-HP for alternative or traditional providers providing outpatient care (HP.3.9.3). As above, this is intended to capture expenditures for providers of systems of medicine not part of the allopathic tradition.

4.17. The category for providers of all other ambulatory health care services (HP.3.9.9) should include the wide variety of informal and less-than-fully-qualified health care providers operating in many low-income countries, regardless of whether these services are sanctioned by the legal system.

4.18. A new 1-digit category has been added to the ICHA-HP to capture institutions that do not provide health care services but which engage in health-related activities. Institutions providing health-related services (HP.8) include research centres, academic institutions, and similar entities. This category would be used if national health expenditure is defined more broadly than the SHA definition (see paragraph 3.22).

4.19. As was done with the ICHA-HC scheme, a category has been added (HP.nsk) for those entities that are known to be engaged in activity within the health accounts boundary but which cannot be allocated to any of the other categories in the HP schedule. There should be very few of these entities, as most of them can be identified by their name if nothing else.

Classifying financing sources

4.20. Analysis of financing sources may be of particular interest in countries where funding for the health system is diverse or changing rapidly in response to new financing strategies. While noting the importance of analysing financing sources for health expenditure, the SHA manual does not include a formal financing sources classification scheme in the ICHA. This *Guide* proposes the scheme shown in Table 4.5 as one approach to categorizing the sources of funds used to purchase health care and related services. The classification is compatible with the existing ICHA schemes and with the guidelines in the system of national accounts for analysing financing sources. It is designed to reflect some of the key policy interests in the health system. The details of the categories in this classification scheme are described in Annex B.

Table 4.5 Proposed classification scheme for financing sources (FS)

Code	Description
FS.1	Public funds
FS.1.1	Territorial government funds
FS.1.1.1	Central government revenue
FS.1.1.2	Regional and municipal government revenue
FS.1.2	Other public funds
FS.1.2.1	Return on assets held by a public entity
FS.1.2.2	Other
FS.2	Private funds
FS.2.1	Employer funds
FS.2.2	Household funds
FS.2.3	Non-profit institutions serving individuals
FS.2.4	Other private funds
FS.2.4.1	Return on assets held by a private entity
FS.2.4.2	Other
FS.3	Rest of the world funds

4.21. The schedule attempts to distinguish among funds that in economic theory elicit different behaviour. Studies have shown that consumers of health care behave differently in response to a given out-of-pocket charge from the way they do in response to the same amount charged as a health insurance premium. That response, in turn, is different from the response were the same amount paid by their employer, and that in turn is different from the response were the same amount levied as an income tax.

4.22. In this scheme, FS.1 covers all public funds. It is further divided: FS.1.1 captures all funds generated as general revenue of territorial government. This includes taxes that are earmarked for health care but collected as value-added, income, or property taxes. For example, in some countries government programmes are partially funded by national lotteries explicitly intended for that purpose. In such cases, the lotteries would be included in FS.1.1. Funds generated as interest on trust funds or other assets held by government health entities are categorized as FS.1.2.

4.23. Unlike general revenues, payroll taxes collected by government that are dedicated to social security funds are not counted under category FS.1.1. These should be tabulated separately and appear according to the contributing source. Employee contributions to social security schemes and to social health insurance are categorized as household funds (FS.2.2).

4.24. Category FS.2 covers all private funds. In addition to contributions to public and private social insurance programmes, employer funds (FS.2.1) include funding for health care activities financed directly by the entity itself, such as self-insurance or operation of its own health care facilities. Similarly, household funds (FS.2.2) include social security and private insurance contributions, and direct payments to providers to cover co-insurance amounts or services not covered by insurance schemes. The category includes funds used to make "grey market" payments to providers. It should also capture (if possible) the market value of barter for services, for example from traditional healers, since if these are measured they must be included in the financing sources as well as financing agents level. Category FS.2.3 is for funds used by national non-profit institutions for health programmes in the current year. The most significant source of other private funds (FS.2.4) is the private capital market, which contributes interest payments on assets held by private-sector health system actors. It also captures net flows of private-sector loans used by providers or insurers to cover current expenses.

4.25. The FS.3 category is reserved for funds that come from outside the country for use in the current year. External resources such as bilateral and multilateral international grants as well as funds contributed by institutions and individuals outside the country are included to the extent that they are used in the current period. Remittances from family members abroad are, however, categorized as FS.2.2. External resources that are used over several years should be recorded that way; for example, when funds are used in equal parts over three years, one-third should appear in each year of the NHA.

4.26. The classification schedule shown in Table 4.5 can be expanded by adding subcategories to accommodate particular sources of revenue that are of policy interest (such as the lotteries mentioned in paragraph 4.22). As always when establishing subcategories, it is very important to remember that they must be mutually exclusive and exhaustive: funds must be able to be placed in one — and only one — category.

Classification schemes for the beneficiary population

4.27. There are many ways to look at the population who uses or benefits from the goods, services, and activities that are included in the health accounts (a point made in Table 3.2 of the SHA manual). The specific categories of the attribute or attributes of the population depend very much on the policy interests of decision-makers, and tend to be country-specific. Like the health systems themselves, however, the population attributes of policy interest tend to be similar across countries. This *Guide* contains a discussion of classification schemes for some of the more common attributes, including demographic, geographical, socioeconomic, and health condition.

4.28. In many cases, there is more than one classification scheme for the relevant population attribute. For example, age categories can be constructed with different cut-off points or numbers of groups. Spending on health problems can be partitioned among disease categories using the International Classification of Diseases (ICD) scheme, WHO's burden of disease classifications *(5)*, or other groupings. In other cases (notably geographical divisions) there are no international standards to guide the health accountant.

4.29. The classification schemes for the distributional and analytical dimensions here are suggestions. National policy needs and data availability will determine the final categories used. The primary responsibility of the health accountant is to ensure that the classification scheme used is policy-relevant and made up of mutually exclusive and exhaustive categories. International comparability and the policy benefits related to it will be increased, however, when countries use schemes that are already being used by other countries and by international organizations.

Classifying populations by demographic characteristics

4.30. Many countries use similar age/sex categories when tabulating population statistics. Sometimes the categories are broad, such as over-65 and under-65 years of age. Other times the categories are as detailed as one year or five year age cohorts.

4.31. A general purpose classification schedule is shown in Table 4.6. It is not intended to be prescriptive, but rather indicative of the types of population groups that often drive health policy.

Table 4.6 Example of an age/sex classification scheme

Age	Sex
Infants (0–12 months)	All Male Female
Young children (1–4 years)	All Male Female
School-age children (5–14 years)	All Male Female
Adults of reproductive age (15–44 years)	All Male Female
Adults (45–64 years)	All Male Female
Adults (65–74 years)	All Male Female
Older adults (75–84 years)	All Male Female
Oldest adults (85+years)	All Male Female

Classifying populations by socioeconomic characteristics

4.32. As with age, the exact socioeconomic grouping of policy interest varies from one country to the next (and often from one policy issue to the next within a country). Household economic condition is one of the most widely used; categories are usually based on household income or household consumption

expenditure (more often the latter, as income is difficult to measure). In most cases, the choice of categories will already be decided for health accountants by the standards and practices of their national statistical agency and by the survey data available to them. One common practice, demonstrated in Chapter 14, is to use expenditure quantiles, which divide the population into equal-sized groups of individuals according to the distribution of their household income. Another practice is to separate the population into those who live below the poverty line from those who live above it.

4.33. Income/expenditure groups are not the only socioeconomic distributions that may be of interest to policy-makers. Other examples include ethnic or religious affiliation, occupation or employment, education, and urban/rural residence.

Classifying populations by health status or disease state

4.34. Partitioning expenditures according to health or disease condition, or, in a related approach, according to activities focused on a particular health or disease condition can be an extremely useful way to analyse the allocation of health resources among specific types of health conditions. Many countries have successfully used the ICD, diagnostic-related groups or other case-based classifications, or health problem/intervention clusters such as reproductive health or HIV/AIDS care and prevention, to categorize the populations that benefit from health expenditure. Being able to link expenditures to specific ICD categories or even to groups of these categories (as in the burden of disease framework) can be a useful approach to tracking resource allocation. Further linkage to health status changes could help develop a powerful monitoring and evaluation methodology.

4.35. Care must be exercised when developing classification schemes to describe this dimension of the health system. Ordinarily, a scheme must contain categories that are mutually exclusive and exhaustive. In the case of diseases or treatments, however, people can be assigned to more than one category, violating the mutual exclusivity requirement. This problem can be solved in a number of ways. One of these ways is to change the unit of analysis from the person to the encounter, which can more easily be categorized in a mutually exclusive and exhaustive way. This approach is very useful when fairly detailed information is available on the individual transactions in the health system. A second approach is to use the scheme to illuminate only parts of the health system (such as reproductive health). Because these partial pictures can overlap, their sum can exceed total national health expenditure and the approach is not useful when actually estimating national expenditure. But the approach is exceptionally helpful for displaying results when policy-makers are interested in how well the health system is doing in specific areas of concern.

4.36. The WHO's global burden of disease (GBD) classification scheme may be a useful way to categorize the nation's health spending in terms of health conditions. It is based on the ICD-10, which in turn has been standardized across nations and is widely used for epidemiological analysis. The GBD analysis is used internationally to generate basic descriptive data at the national level, using a single measurement approach. The categories in the scheme, shown in Table 4.7, can be expanded or compressed as needed and as permitted by the level of detail available in the data; they are often abridged to focus on the high volume and high cost intervention or diagnostic groups that are relevant to decision-making, such as renal failure, tuberculosis, malaria, HIV/AIDS, diabetes, malnutrition, and hypertension.

Table 4.7 WHO's global burden of disease (GBD) classification scheme

Code	Description
GBD.1	Communicable diseases, maternal and perinatal conditions and nutritional deficiencies
GBD.1.1	Infectious and parasitic diseases
GBD.1.1.1	Tuberculosis
GBD.1.1.2	Sexually transmitted diseases
GBD.1.1.3	HIV disease
GBD.1.1.4	Diarrhoeal diseases
GBD.1.1.5	Childhood diseases
GBD.1.1.6	Meningitis
GBD.1.1.7	Hepatitis
GBD.1.1.8	Malaria
GBD.1.1.9	Tropical diseases
GBD.1.1.10	Leprosy
GBD.1.1.11	Dengue
GBD.1.1.12	Japanese encephalitis
GBD.1.1.13	Trachoma
GBD.1.1.14	Intestinal nematode infection
GBD.1.1.15	Respiratory infections
GBD.1.1.16	Maternal conditions
GBD.1.1.17	Perinatal conditions
GBD.1.1.18	Nutritional deficiencies
GBD.1.1.19	All other communicable, maternal, perinatal, and nutritional conditions
GBD.2	Noncommunicable conditions
GBD.2.1	Malignant neoplasms
GBD.2.2	Other neoplasms
GBD.2.3	Diabetes mellitus
GBD.2.4	Endocrinal and nutritional disorders
GBD.2.5	Neuropsychiatric disorders
GBD.2.6	Sense organ disorders
GBD.2.7	Cardiovascular diseases
GBD.2.8	Respiratory diseases
GBD.2.9	Digestive diseases
GBD.2.10	Diseases of the genitourinary system
GBD.2.11	Skin diseases
GBD.2.12	Muskuloeskeletal diseases
GBD.2.13	Congenital abnormalities
GBD.2.14	Oral diseases
GBD.2.15	All other noncommunicable conditions
GBD.3	Injuries
GBD.3.1	Unintentional
GBD.3.1.1	Road traffic accidents
GBD.3.2	Intentional
GBD.3.2.1	Self-inflicted
GBD.3.2.2	Homicide and violence
GBD.3.2.3	War
GBD.3.3	All other injury conditions

Classifying the resources used to produce health care goods and services

4.37. The classification schedules described above are focused on the outputs of the health system, but it is also instructive to look at the resources being used to create those outputs. An analysis of resource spending can have many policy uses, including development of policies regarding payments for human resources, for investment, for expenditure on pharmaceuticals, and for other significant inputs. Further, in a number of countries this type of information has been the first — and sometimes the only — expenditure data breakdown available to health accountants at the start of their work.

4.38. In a few countries, ad hoc breakdowns of the resource cost type have been prepared using whatever classification scheme was available, but there are well-defined and well-accepted schemes that should be used wherever possible. The International Monetary Fund (IMF) *Government finance statistics* manual contains an economic classification of expenses, and the system of national accounts uses the same breakdown. These and similar categories have been used by governments as a standard framework for describing public expenditures by entities such as the ministry of health or social security fund. Comparable breakdowns are often used in tax reports, audit reports and special analyses. Even in countries at a very early stage of development of health accounts, the trend is to develop classifications compatible with the IMF standard. This *Guide* therefore proposes a classification scheme that can be easily crosswalked to the IMF framework. This classification scheme is shown in Table 4.8 and, as with the other schemes, can be collapsed or expanded as required by policy needs and permitted by data.

Table 4.8 A resource cost (RC) or economic classification

Code	Description
RC.1	Current outlays
RC.1.1	Compensation of employees and owners
RC.1.1.1	Wages
RC.1.1.2	Social contributions
RC.1.1.3	Non-wage labour income
RC.1.2	Supplies and services
RC.1.2.1	Material supplies
RC.1.2.1.1	Drugs and pharmaceuticals
RC.1.2.1.2	Other supplies
RC.1.2.2	Services
RC.1.3	Consumption of fixed capital
RC.1.4	Interest
RC.1.5	Subsidies to providersa
RC.1.6	Transfers to households[a]
RC.1.9	Other current expenditure
RC.2	Capital expenditure
RC.2.1	Buildings
RC.2.2	Movable equipment
RC.2.2.1	Vehicles
RC.2.2.2	Other
RC.2.3	Capital transfers to providers[a]

[a]These categories are not applicable when classifying resource costs faced by providers.

4.39. Care must be taken to avoid double counting expenditures when using the resource cost approach to measuring national health expenditure. Costs of one entity may be income of another one, and these intrasector flows must be handled so as to capture the resources only when they are finally engaged.

Concluding thoughts on classification schemes

4.40. It is quite possible that the early sketch of the system described in Chapter 2 will evolve as a result of the process of classifying and categorizing the actors and activities in the health care system. This is a natural outcome of the health accounting activity, and indeed a beneficial one, as it adds clarity to what may well have been a partial understanding of what constitutes the health system.

4.41. The classifications presented in this chapter help to partition national health expenditure in several dimensions: who distributes the money that finances activities, who provides that money, who performs the activities, how the activities are produced, and who receives their benefit. They constitute the main families that can be used to cross-tabulate spending along two dimensions, the procedure by which health accounting tables or matrices are formed or presented.

4.42. This *Guide* uses the ICHA wherever possible, and it is recommended that national health accountants do the same. Examples have been given of ways in which nationally relevant categories can be merged into the ICHA scheme without loss of international comparability.

4.43. Countries' health accountants will adapt the international classification schemes in several ways. First, to better reflect national institutional structures, policy interests, and conditions, countries will want to introduce appropriate subcategories into the schemes. A second adaptation is the elimination of categories or subcategories that are not relevant in a particular country, although health accountants should note this treatment in the explanatory material accompanying the NHA tables. A third adaptation can be found in countries where the sequence or numbering in the classification schemes described above does not fit with their national practice. In such cases, countries have sometimes developed their own numbering schemes. Adaptations are important when they make NHA more relevant and useful. However, analysts should make every effort to retain the overall structure of the ICHA classification scheme at the one or two digit level or to prepare a chart crosswalking categories from the national approach to the standard schemes.

4.44. Adoption of classification standards is a critical point in the development of a country's health accounts. The robustness and the validity of the entire accounting process depends on the care taken at this stage to ensure that the classifications provide policy relevance, comprehensiveness, consistency, standardization, stability over time, and feasibility of implementation.

Chapter 5

National health accounts tables

5.01. In paragraph 1.02, national health accounts (NHA) are described as a set of tables in which are arrayed various aspects of a nation's health expenditure. This chapter contains a discussion of the types of tables that can be produced in this set to support sound policy and good governance.

5.02. NHA tables serve two purposes. One is to display estimates of national health expenditure in ways that resonate with decision-makers. The tables described here — and others similar to them — can be linked to fundamental policy questions such as:

- How are resources for health and health care mobilized? Who pays the money out, who provides the money to be paid, and how?
- How are those resources organized and managed?
- What goods and services are provided and by whom?
- Who uses those goods and services?

5.03. The other purpose of NHA tables is to facilitate the estimation process itself. As will become apparent in subsequent chapters, estimating national health expenditure is not simply a matter of adding up numbers: care must be taken to compare numbers from different sources that produce information about different dimensions of the health care system, and to identify areas in which no information is present. Some of the tables described here provide a framework for estimation, pointing to gaps, overlaps, and other problem areas to be addressed, as well as to those areas that appear to be solid.

5.04. The tables presented here represent a "menu" from which health accountants can draw, but they are not the only valuable ones. Each country's policy-makers have their own information needs that must be addressed with health accounts data. And the usefulness of NHA tables is enhanced when they can be linked with data arrays related to non-financial aspects of the health system, such as morbidity, mortality, and outcomes.

5.05. Nor are the tables presented here a minimum acceptable set. No one nation — regardless of the maturity of its health accounts — has yet to produce all of these tables simultaneously, although many nations have produced some of the tables on a regular basis and each of the tables at one time or another. This chapter should be seen as staking out a field which health accountants can cultivate as resources, data, and national policy purposes allow. Producing any table, or only some tables, is certainly better than producing none. Producing more will often be preferable to producing fewer, although concentrating on a few key tables may be preferable when faced by resource constraints. The choice of which tables to produce should be linked to their potential usefulness as well as the feasibility of their construction.

The structure of national health accounts tables

5.06. The tables described in this chapter incorporate the classification schemes described in Chapters 3 and 4. They are compatible with those proposed in the system of health accounts (SHA) manual, and are derived from the experience of countries in which NHA have already been established. The dimensions of health expenditure they portray include:

- Financing sources: institutions or entities that provide the funds used in the system by financing agents;
- Financing agents: institutions or entities that channel the funds provided by financing sources and use those funds to pay for, or purchase, the activities inside the health accounts boundary;
- Providers: entities that receive money in exchange for or in anticipation of producing the activities inside the health accounts boundary;
- Functions: the types of goods and services provided and activities performed within the health accounts boundary;

- Resource costs: the factors or inputs used by providers or financing agents to produce the goods and services consumed or the activities conducted in the system;
- Beneficiaries — the people who receive those health goods and services or benefit from those activities (beneficiaries can be categorized in many different ways, including their age and sex, their socioeconomic status, their health status, and their location)[8]

5.07. Each of the NHA tables in this chapter displays some facet of health expenditure cross-tabulated by two of the dimensions listed above. One of these dimensions can be thought of as the "origin" of the funds and the other dimension as the "use" of the funds. By convention, the origin dimension is shown as columns in the table and the use dimension is shown as rows. Following this convention, each cell in the table shows the amount of resources used for the row category *i* of "use" from the column category *j* of "origin" ("spent by *j* on *i*") as illustrated in Table 5.1. In a departure from the mathematical convention that matrices are called by their row and column, NHA tables are called by column and row; this convention is rooted in long-standing health accounts tradition and reflects the flow of resources from the origin to the use.

Table 5.1 Structure of a typical table in the set of tables comprising the national health accounts

Use dimension	Origin dimension				
	origin 1	origin 2	...	origin 3	origin 4
use 1	$expenditure_{11}$	$expenditure_{12}$	...	$expenditure_{1n}$	$expenditure_{1.}$
use 2	$expenditure_{21}$	$expenditure_{22}$	...	$expenditure_{2n}$	$expenditure_{2.}$
...	...	...	...	...	...
use m	$expenditure_{m1}$	$expenditure_{m2}$	...	$expenditure_{mn}$	$expenditure_{m.}$
sum of all uses	$expenditure_{1.}$	$expenditure_{2.}$	...	$expenditure_{n.}$	total expenditure

5.08. Experience in countries where health accounts have been created indicates that three of the dimensions listed are critical for accurate estimation of total health spending. These are the dimensions of financing agents, providers, and functions. Consequently, the NHA tables that cross-tabulate these dimensions are important tools in the creation of the aggregate totals or subtotals displayed in all of the tables discussed in this chapter.[9]

- Health expenditure by type of financing agent and type of provider (FAxP);
- Health expenditure by type of provider and type of function (PxF);

[8] Beneficiaries could be sub-divided by demographic characteristics, socioeconomic status, health status, and regions, and are defined in paragraph 1.17.

[9] As mentioned, the tables shown in this chapter are consistent with those shown in the SHA manual. In that manual, ten tables are proposed for estimation:

- Table 1. Current expenditure on health by function of care, provider and financing agent.
- Table 2. Current expenditure on health by function of care and provider industry.
- Table 3. Current expenditure on health by provider industry and financing agent.
- Table 4. Current expenditure on health by function of care and financing agent.
- Table 5. Total expenditure on health including health-related functions (Table 4 with HC.R.2 to HC.R.7 added).
- Table 6. Personal expenditure (HC.1 to HC.5) on health by major ICD category.
- Table 7. Personal expenditure on health by age and sex.
- Table 8. Selected prices for health care.
- Table 9. International trade in health care.
- Table 10. Total employment in health care industries.

Some of these tables are easier to implement than others. Although OECD Member countries are pledged to develop all of them, most countries implementing SHA have concentrated on Tables 2-5.

- Health expenditure by type of financing agent and type of function (FAxF);
- Health expenditure by financing source and type of financing agent (FSxFA);
- Cost of resources used to produce health goods and services;
- Health expenditure by age and sex of the population;
- Health expenditure by socioeconomic status of the population;
- Health expenditure by health status of the population;
- Health expenditure by geographic region.

5.09. Each of these tables is explained below, including a generic depiction of the table. The classification schemes laid out in Chapters 3 and 4 are used at an aggregate level to show how the table is constructed. In practice, health accountants will show more detail, including subcategories of the schemes or nationally-specific schemes.

Health expenditure by type of financing agent and type of provider

5.10. The table showing health expenditure by type of financing agent and type of provider (FAxP) (see Table 5.2, page 57) lays out flows of financing to different types of health care providers from the various financing agents. It answers the question of "who finances whom" in the health system, i.e. which payers and purchasers are supporting which providers in the system.

5.11. The FAxP table has a number of important uses. It describes how funds are distributed across different types of providers - for example, what share of total spending goes to hospitals relative to ambulatory care providers. This distribution can be a valuable indicator of the priority given in practice (as opposed to on paper) to health care. Because different financing agents often use different payment and purchasing methods, this table can also provide a starting point for assessing those differences.

5.12. As with other NHA tables, the FAxP table can be combined with other health system information to explore important questions. For example, knowing the total expenditure on specific types of providers can be linked to measures of the service throughput of those providers in order to estimate average expenditure per unit of service delivered. This provides a basis for cost-efficiency comparisons across types of providers. For example, if a country's health accounts could separate hospital spending into government and nongovernment acute hospitals and if the total number of admissions into each type of hospital were known, then one could calculate average expenditure per admission for each type of hospital. Such aggregate comparisons are a useful first look at efficiency aspects, although further analysis of factors such as case mix and hospital technology is necessary to explain differences adequately.

5.13. Health accounting experience has shown the FAxP table to be an important tool for estimating total health spending, and it should be an early focus of the health accounts initiative.

Health expenditure by type of provider and by function

5.14. The table showing health expenditure by type of provider and by function (PxF) (see Table 5.3, page 58) shows how expenditures on different health functions are channelled through the various types of providers. That is, it tells the reader "who does what". This table provides a useful perspective on the contribution of different types of providers to the total spending on specific types of services. For example, in many countries community public health services are provided by hospitals as well as by ambulatory health care providers. In the PxF table, it is possible to examine total expenditure on public

health programmes (HC.6) and see the shares of spending accounted for by hospitals and ambulatory care providers, to gain a perspective of where spending for this important health system function is located.

5.15. This table has also proved to be valuable for estimating total health spending. With the FAxP and FAxF tables, it should be an early focus of the health accounts initiative.

Health expenditure by type of financing agent and by function

5.16. The table showing health expenditure by type of financing agent and by function (FAxF) (see Table 5.4, page 59) shows who finances what types of services in the health system. It highlights some of the important resource issues that must be considered in health policy. For example, allocating resources to priority health services (such as control of infectious diseases) is one of the important objectives that governments try to achieve to improve health system performance. The FAxF table can be used to describe the overall and specific allocation of resources to the major types of services. It can also highlight the relative emphasis of public and private financing agents with respect to the various functions of health care and related activity. Experience shows this table to be an important tool for estimating total health spending, and it should be an early focus of the health accounts initiative. However, in many countries this table cannot be produced alone. It must be estimated simultaneously with one or both of the two tables discussed above.

Health expenditure by type of financing source and financing agent

5.17. The table showing health expenditure by type of financing source and financing agent (FSxFA) (see Table 5.5, page 60) highlights resource mobilization patterns in the health system. It addresses the question of "where does the money come from" by showing the financing sources that contribute to each financing agent. The table also shows how prominent a role each source plays in the financing of each financing agent and in total spending overall. This table can illuminate important aspects of the distribution of financial contributions to the health care system across the main types of financing sources. For example, households and firms typically contribute to total health spending both through direct expenditures and through contributions to social and private insurance. The FSxFA table provides an accounting of these total contributions and their relative size.

5.18. In the financing sources classification, some funds are categorized as government general revenue. It is possible to trace those funds back even further — to taxes paid by firms, households, and the rest of the world. This further analysis contributes to "incidence of financing" assessments, which have been done as part of the analysis of the overall equity of financing in some countries.

Costs of resources used to produce health goods and services

5.19. A table showing costs of resources used to produce health goods and services can be constructed in two different ways to illustrate the shares of national health expenditure contributed by the value of labour, pharmaceutical supplies, equipment and buildings, and so on. This information is a key monitoring tool in determining overall system performance and provides a basis for the analysis of the efficiency of production and resource use. Because resource cost classifications are a standard tool of analysis for government finance statistics and for compilations of tax registries and other public reporting systems, the "line item" approach of this table is often the first step countries take down the path of developing more comprehensive NHA.

5.20. The two formulations of this table differ in the column dimension used. If the table is prepared to show providers by resource costs (PxRC), the focus is more on efficiency differences across different production patterns, especially when this can be linked to additional information on health care activities and outcomes. If financing agents are used in the column dimension (FAxRC), the table facilitates an assessment of how different financing and allocation strategies affect different mixes of "inputs".

Tables showing the distribution of health spending among the population

5.21. Where the tables discussed so far focus on the financial mechanics of producing the goods, services and activities that lie inside the health accounts boundary, the remaining tables focus on how the expenditures in the system are distributed among the population. Economists refer to these types of distributional breakdowns as "benefit incidence" analyses.

5.22. Simply knowing the shares of total spending reaching these different groups provides an important overall picture of the distributional character — the equity — of health system spending. For example, if the lowest 20% of the population classified by income, which usually also is the least healthy, is the beneficiary of, say, only 10% of the total health spending, this alone sheds light on the overall fairness of health expenditure.

5.23. Health accounts add to this single-statistic type of analysis. In addition to more accurate measurement of health spending than can come from looking at a single dimension, the cross-tabulation of population dimensions with dimensions such as financing agents, providers, functions, and financing sources provides a much richer picture of the equity of the health system. For example, measuring how funds from specific financing agents are distributed among specific population groups can illuminate who is financing health care for whom in the population. The policy-makers in many countries are struggling at present to understand what share of the health care received by poor people is funded by government agencies and what share by direct household spending by the poor themselves.

5.24. Cross-tabulating along other dimensions produces useful information, too. For example, knowing which providers account for the largest share of the value of services delivered to women or children is important to planners designing interventions to improve the health care of those groups. Breakdowns by functions help analysts answer questions on the distribution among the population of expenditures on public health services or inpatient treatment.

5.25. As these illustrations indicate, there are a number of different NHA tables that can be developed to illustrate the distribution of spending among the population. Each has its own relevance for health system policies. The tables discussed in this *Guide* are illustrative of this family, but national policy-makers may demand — and national health accountants should supply — other tables of equal importance.

Health expenditure by age and sex of the population

5.26. Table 5.6 (see page 61) provides an example of a table showing health expenditure by age and sex of the population. This table highlights the distribution of health goods and services among age/sex groups in the population, for example, children, the elderly, or women of childbearing age. Such information can be used to assess the age/sex targeting of expenditures by specific payers; for example, the success of ministry of health efforts to increase spending on child health or women's reproductive health. The table can also help policy-makers assess the actual coverage of social insurance for specific groups, such as older women. The second dimension of this table could also be provider (P), function (F), or even financing source (FxS).

Health expenditure by socioeconomic status of the population

5.27. Does the composition of financing one's health care vary with one's position in society? This is the type of question that can be answered using information from a NHA table cross-tabulating national health expenditure by financing agents and beneficiaries' socioeconomic status (see Table 5.7, page 62). Using measures such as household income or household expenditure — aggregating the population into quintiles, perhaps — health accounts can be used to assess how well specific payers target vulnerable groups and what share of the burden of spending is being borne by different groups. Analysed over time, the accounts can show whether policies to improve the distribution of the burden of health care costs are having the desired effect.

5.28. Similar cross-tabulations can be constructed using other dimensions, such as providers and functions. A table showing health functions crossed against socioeconomic status can help to assess the targeting of specific types of health services by beneficiaries' capacity to pay. Analysis of this type is already widely used in equity studies of health care and has highlighted policy-relevant maldistributions, such as when low-income groups bear a very high share of private spending on ambulatory care or higher-income groups receive a large share of public hospital expenditure. Socioeconomic status measures such as education, occupational prestige, race and ethnicity, can be used to shed light on how well the nation's health care system is protecting society's more vulnerable members.

Health expenditure by health status of the population

5.29. Tabulating national health expenditure by health status of the population is one of the more challenging health accounts activities. It requires reliable health condition or diagnostic data from providers and patients that can be linked with expenditure estimates, and these data are often difficult to obtain. Also, many health encounters, such as routine check-ups and non-specific symptomatic complaints, do not result in a specific attributable diagnosis. This means that large blocks of health activity cannot be attributed to a specific problem. And it may be difficult to partition this dimension of health system activity into mutually exclusive and exhaustive categories. Indeed, achieving a complete allocation of health spending according to health problem/disease categories may be quite difficult - but a complete allocation may not always be required, as many policy questions focus on just one or two health problems.

5.30. Although Table 5.8 (see page 63), shown here as an example, has financing agents as the column dimension, the provider or function dimensions may be as appropriate if not more appropriate for many policy analyses. Using the financing agent dimension shows who pays for health activities addressing specific problems and what share of their total spending goes to these problems. Using the provider dimension shows who provides the health activities addressing specific problems and what share of their total resources goes to these problems. Using the function dimension shows the types of health care services used to handle specific problems and what share of service-related effort (in financial terms) goes to these problems. Each of these sets of questions are important for different purposes relating to policies and programmes, and health accountants will need to tailor their tables to the policy needs at hand and foreseen for the future.

Health expenditure by geographical region

5.31. Very often health accountants are asked to produce tables showing the distribution of expenditures by financing agents across specific geographical regions in a country. These regions typically are defined according to national policy interest — provinces/states or groups of provinces, economic zones, and so on. Geographical breakdowns are especially useful in countries with administrative or financial decentralization, because the tables can be important tools for assessing the fiscal impact of distributed authority on spending.

5.32. Table 5.9 (see page 64) gives an example of a table showing health expenditure by geographical region. As with the other tables described in this chapter, using the provider or function dimension rather than the financing agent dimension in the cross-tabulation helps tailor the tables to policy needs. For example, policy-makers may wish to know the extent to which different regions rely on different provider types to deliver care. The table shown here is only an example of what a regional distribution might look like; national policy concerns will drive the actual dimensions and classifications used.

Time as a dimension of the health accounts tables

5.33. Because of the importance of time trends in the analysis of the health system, many countries have included tables in their health accounts that explicitly incorporate a time dimension. An example of such a table is shown in as Table 5.10 (see page 65).

5.34. Although these tables represent important parts of the health accounts presentation, they are not addressed directly in the *Guide*. The *Guide* does stress the need for consistency across the years being estimated, as well as the usefulness of multiple years of estimates for the purposes of triangulating (that is, cross-checking) those estimates. Health accounts teams should develop a reliable time series of health expenditure estimates as soon as practicable in their work. Tables such Table 5.10 can be derived from the time series of cross-sectional tables described in this chapter, or they can be built as a precursor to those cross-sectional tables.

Developing a set of tables for the national health accounts

5.35. As health accountants lay out their work plans, they must address two questions regarding tables. First, which tables should be included? Second, which tables should be prepared first and which should be prepared later?

5.36. The answer to the first question lies in the policy imperatives of the country. National policy-makers have specific needs for information that must be met if the health accounts are to be useful. These needs may be obvious, or they may need to be teased out of discussions with potential users. In either case, it is wise to include those users in discussions leading to the formulation of a set of health accounts tables. In addition to national policy issues, countries may face other demands on their health accounts. For example, members of the European Union are pledged to work towards development of the tables laid out in the SHA manual, many — but not all — of which also appear in this chapter. Finally, there are some tables that will naturally find their way into the health accounts by virtue of their usefulness in estimating the totals to be distributed or cross-tabulated in other tables.

5.37. As to which tables should be prepared first, again the answer lies in circumstances specific to the country. What has emerged from the experience of countries in which health accounts have been developed is that the starting point is an analysis of financing agents. The subsequent path of estimation depends upon the availability and quality of data available to the health accounts team. Chapters 9 to 14 of this *Guide* present an overview of different approaches to estimation, and a detailed "how to" sequence based on some real world examples and on a fictional country with a moderate amount of data.

Table 5.2 National health expenditure by type of financing agent and type of provider (FAxP)

Providers	Financing agent										Total
	HF.1 General government				HF.2 Private sector					HF.3	
	HF.1.1 Territorial government			HF.1.2	HF.2.1	HF.2.2	HF.2.3	HF.2.4	HF.2.5		
	HF.1.1.1 Central government	HF.1.1.2 State/ provincial government	HF.1.1.3 Local/ municipal government	Social security funds	Private social insurance	Other private insurance	Private households' out-of-pocket payment	Non-profit institutions serving households	Private firms and corporations	Rest of the world	
HP.1 Hospitals											
HP.2 Nursing and residential care facilities											
HP.3 Providers of ambulatory health care											
HP.4 Retail sale and other providers of medical goods											
HP.5 Provision and administration of public health programmes											
HP.6 General health administration and insurance											
HP.7 All other industries											
HP.8 Institutions providing health-related services											
HP.9 Rest of the world											
National health expenditure											

NOTES: This table corresponds to Table 3 in the OECD system of health accounts (SHA) manual.
In practice, additional rows and columns will likely be included to serve national policy interests. This shell is for illustrative purposes only.
HP.8 will be applicable only if national health expenditure is defined more broadly than the total in SHA.

Table 5.3 National health expenditure by type of provider and by function (PxF)

Functions	Providers									Total
	HP.1 Hospitals	HP.2 Nursing and residential care facilities	HP.3 Providers of ambulatory health care	HP.4 Retail sale and other providers of medical goods	HP.5 Provision and administration of public health programmes	HP.6 General health administration and insurance	HP.7 All other industries	HP.8 Institutions providing health-related services	HP.9 Rest of the world	
HC.1 Services of curative care										
HC.2 Services of rehabilitative care										
HC.3 Services of long-term nursing care										
[additional row entries]										
National health expenditure										

Notes: This table corresponds to Table 2 in the OECD system of health accounts (SHA) manual.
In practice, additional rows and columns will likely be included to serve national policy interests.This shell is for illustrative purposes only.
HP.8 will be applicable only if national health expenditure is defined more broadly than the total in SHA.

Table 5.4 National health expenditure by type of financing agent and by function (FAxF)

Functions	Financing agents										Total
	HF.1 General government				HF.2 Private sector					HF.3	
	HF.1.1 Territorial government			HF.1.2	HF.2.1	HF.2.2	HF.2.3	HF.2.4	HF.2.5		
	HF.1.1.1 Central government	HF.1.1.2 State/ provincial government	HF.1.1.3 Local/ municipal government	Social security funds	Private social insurance	Other private insurance	Private households' out-of-pocket payment	Non-profit institutions serving households	Private firms and corporations	Rest of the world	
HC.1 Services of curative care											
HC.2 Services of rehabilitative care											
HC.3 Services of long-term nursing care											
[additional row entries]											
National health expenditure											

Notes: This table corresponds to Table 4 in the OECD system of health accounts (SHA) manual. In practice, additional rows and columns will likely be included to serve national policy interests. This shell is for illustrative purposes only.

Table 5.5 National health expenditure by type of financing source and type of financing agent (FSxFA)

Financing agents	Financing sources										Total
	FS.1 Public funds				FS.2 Private funds					FS.3[a]	
	FS.1.1.1 Central government revenue	FS.1.1.2 Regional and municipal government revenue	FS.1.2 Other public funds	Total	FS.2.1 Employer funds	FS.2.2 Household funds	FS.2.3 Non-profit institutions serving individuals	FS.2.4 Other private funds	Total	Rest of the world	
HF.1.1.1 Central government											
HF.1.1.2 State/provincial government											
HF.1.1.3 Local/municipal government											
HF.1.2 Social security funds							a				a
HF.2.1 Private social insurance							a				a
HF.2.2 Private insurance enterprises							a				a
HF.2.3 Private households out-of-pocket											
HF.2.4 Non-profit institutions serving households											
HF.2.5 Private firms and corporations											
HF.3 Rest of the world											
Total funds provided											

Notes: Shaded cells are inapplicable. In practice, additional rows and columns will likely be included to serve national policy interests. This shell is for illustrative purposes only.
[a]Programmatic contributions only. Contributions by institutions for their employees are included with FS.2.1.

Table 5.6 Personal health expenditure by type of financing agent and by age and sex of the population

Age and sex of population		Financing agents										Total
		HF.1 General government				HF.2 Private sector					HF.3 Rest of the world	
		HF.1.1 Territorial government			HF.1.2 Social security funds	HF.2.1 Private social insurance	HF.2.2 Other private insurance	HF.2.3 Private households' out-of-pocket payment	HF.2.4 Non-profit institutions serving households	HF.2.5 Private firms and corporations		
		HF.1.1.1 Central government	HF.1.1.2 State/ provincial government	HF.1.1.3 Local/ municipal government								
Infants	M											
	F											
Pre-school 1–4	M											
	F											
School-age 5–14	M											
	F											
Reproductive-age 15–44	M											
	F											
Adult 45–64	M											
	F											
Adult 65–74	M											
	F											
Elderly 75–84	M											
	F											
Oldest 85+	M											
	F											
All persons	M											
	F											
	All											

Notes: This table corresponds to Table 7 in the OECD system of health accounts (SHA) manual. Personal health expenditure includes functional categories HC.1 to HC.5.
In practice, additional rows and columns will likely be included to serve national policy interests. This shell is for illustrative purposes only.

Table 5.7 National health expenditure[a] by type of financing agent and by per capita household expenditure quintile

Quintile of per capita household expenditure on all goods and services	Financing agents										Total[a]
	HF.1 General government				HF.2 Private sector					HF.3	
	HF.1.1 Territorial government			HF.1.2	HF.2.1	HF.2.2	HF.2.3	HF.2.4	HF.2.5		
	HF.1.1.1 Central government	HF.1.1.2 State/ provincial government	HF.1.1.3 Local/ municipal government	Social security funds	Private social insurance	Other private insurance	Private households' out-of-pocket payment	Non-profit institutions serving households	Private firms and corporations	Rest of the world	
Lowest Quintile											
Quintile II											
Quintile III											
Quintile IV											
Highest Quintile											
Total											

Notes: Per capita household expenditure is used as an example of socioeconomic status measures. The specific measure and number of groupings will vary on a case by case basis.
[a]In most countries that prepare this table, personal health expenditure (HC.1 to HC.5) is used. Analysts should specify which measure of health expenditure is being used.

Table 5.8 National health expenditure[a] by type of financing agent and by disease group[b]

Disease groups	Financing agents										Total[a]
	HF.1 General government				HF.2 Private sector					HF.3	
	HF.1.1 Territorial government			HF.1.2	HF.2.1	HF.2.2	HF.2.3	HF.2.4	HF.2.5		
	HF.1.1.1 Central government	HF.1.1.2 State/ provincial government	HF.1.1.3 Local/ municipal government	Social security funds	Private social insurance	Other private insurance	Private households' out-of-pocket payment	Non-profit institutions serving households	Private firms and corporations	Rest of the world	
GBD.1 Communicable diseases, maternal and perinatal conditions and nutritional deficiencies											
GBD.1.1.2 Sexually transmitted diseases											
GBD.2 Noncommunicable conditions											
GBD.3 Injuries											
Total											

Notes: Disease groups are shown as examples only. The classification used and categories shown will vary on a case by case basis.
[a]Analysts should specify which total measure is being used.
[b]Accompanying notes should explain how the disease dimension was partitioned so that categories do not overlap.

Table 5.9 National health expenditure by type of financing agent and by region[a]

Regions	Financing agents										Total
	HF.1 General government				HF.2 Private sector					HF.3	
	HF.1.1 Territorial government			HF.1.2	HF.2.1	HF.2.2	HF.2.3	HF.2.4	HF.2.5		
	HF.1.1.1 Central government	HF.1.1.2 State/ provincial government	HF.1.1.3 Local/ municipal government	Social security funds	Private social insurance	Other private insurance	Private households' out-of-pocket payment	Non-profit institutions serving households	Private firms and corporations	Rest of the world	
Region I											
Region II											
Region III											
[additional rows]											
National health expenditure											

Notes: The geographical units are country-specific and correspond to the level at which decisions are made, aggregated to a meaningful subtotal when too numerous (e.g. municipalities).
[a]Analysts should specify whether this table has been prepared by place of residence or by place of service.

Table 5.10 Functional classification of government health expenditures, Nepal, 1990–2000

Summary of Ministry of Health expenditures by function (Rs. '000)	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/2000
Services of curative care	304469	386869	478479	598456	807697	1047330	1089940	1540959	1793431	1986473
Inpatient care	96794	112760	136199	162175	257741	281617	281767	505113	637507	549209
Ambulatory care	207675	274109	342281	436281	549956	765713	808174	1035847	1155924	1437264
Services of rehabilitative care				185						
Ancillary services to medical care	6390	4137	5208	6748	20416	12591	8423	9209	9266	10452
Medical goods dispensed to outpatients	16683	58539	12961	52152	156245	195262	232736	156028	317394	295110
Preventive and public health services	434006	427440	448929	534916	532114	490432	503089	536795	489690	591213
Health programme administration and health insurance	66018	69338	132586	76843	203139	284301	804883	737954	891189	927960
Capital formation of health care provider institutions	15524	39576	106036	117994	74000	121393	147642	133088	130151	189828
Total expenditure on health	843090	985899	1184199	1387294	1793611	2151309	2786713	3114033	3631121	4001036
Health-related functions	41780	37452	30448	74058	276423	384205	671268	736006	276102	316480
Summary of Ministry of Health expenditures by provider (Rs. '000)	**1990/91**	**1991/92**	**1992/93**	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/2000**
Central government hospitals	56787	66251	72815	120848	239448	252706	265520	572795	720137	614151
Regional hospital	10000	10700	37700	72530	271759	375500	662175	728300	269300	309500
Zonal hospital	22895	26500	33000	33000	43000	49000	51450	53800	63800	64000
District hospital	48596	57635	71055	73200	79053	98305	95879	103195	124987	105933
Central non-hospital medical service facilities	9045	6872	9125	10724	24990	16602	12102	13465	13948	14916
District non-hospital medical service facilities	165483	225783	283909	366777	437996	628769	654456	792369	864707	1169889
Government public health service	456993	443756	499933	536877	527540	481921	494410	530039	482508	586749
Central administrative and other institutions	112077	182329	203288	243469	439282	628314	1207514	1041076	1349636	1426578
Production of traditional medicine										
Singha durbar vaidyakhana*	2994	3525	3822	3927	6966	4397	14475	15000	18200	25800
TOTAL expenditures (includes health-related function)	884870	1023351	1214647	1461352	2070034	2535514	3457981	3850039	3907223	4317516

Note: Expenditures are in thousands of rupees.

Source: Data International, Nepal Health Economics Association, and Sri Lanka Institute of Policy Studies. *Equity in Financing and Delivery of Health Services in Bangladesh, Nepal and Sri Lanka*. Colombo, Institute of Policy Studies, 2001, (http://www.ips.lk).

* Government-subsidized Ayurvedic drug outlet that was located in a building named *Singha Durbar.*

Chapter 6

Data and national health accounts

6.01. Once the framework for a country's health accounts has been established, the next task is to assemble a database with which to estimate the parts of that framework. A solid understanding of the characteristics and dependability of the underlying data is fundamental to the development of high-quality national health expenditure figures, and a considerable amount of time should be spent searching for, evaluating, and comparing sources of data to find those that best capture the transactions and flows of resources that occur in the health system.

6.02. In many countries, a great part of the data needed for health accounts can be found "off-the-shelf". Existing reports and various national statistical projects can be excellent sources of data themselves, and can also be used to identify other sources of information. All documents, whether government, academic, reports of external agencies, or other, should be considered. This is a productive start, but the quality of off-the-shelf data as they apply to the health accounts must still be assessed; and a search must still be undertaken to uncover the remaining data needed to complete the accounts. Thus, the data collection aspect of health accounting has four goals:

- using all suitable existing data;
- adjusting existing data to bring them closer to suitability;
- improving or enriching surveys and administrative records with a potential for suitability;
- arranging for collection or generation of "missing" data.

6.03. The dimensions of health spending that are to be estimated should be kept in mind as data are assembled. Will subnational accounts be developed? Is there to be a disaggregation of spending by type of disease, or by population groups? If so, which groupings are to be used? Answers to questions like these help determine what data need to be sought, and how they should be assembled and analysed. Time spent developing and reviewing the analytical plan for use of the accounts – the policy uses to which they will be put – is well spent at this point in the project.

6.04. This part of the *Guide* deals with the strengths and weaknesses of various types of data for use in national health accounts, and provides some suggestions for dealing with these weaknesses. This is important, because in developing estimates for any given entry, the health accountant will encounter one of three situations:

- *No data are available.* This, of course, requires that new data sources be developed, preferably in the most effective and efficient way.
- *There is only one data source.* This situation is better than where there are no data, but requires an assessment of the quality of that one figure - is it too high, or too low, or just right? - with little or no corroborating evidence.
- *There is more than one source of data.* This situation is better still, but poses problems of its own: quite probably the sources disagree on a value for the element being estimated. Which source is likely to be better? How will the use of one and not another be explained? Or should the final estimate lie somewhere between the values reported?

6.05. The matrix nature of health accounting helps a great deal in all three of these situations. It does so by creating a context within which the given estimate must fit, establishing a sort of upper and lower limit on what the number could be.

Creating a data plan

6.06. Before beginning to populate the tables that comprise the NHA — that is, before estimating the entries that they contain — it is important to plan the acquisition of the data that will be used. As with

the other stages of health accounts development, the minutes spent in initial planning save hours of time later in the process as well as the potentially considerable expense of false starts, dead ends, and restarts.

6.07. A very important prerequisite to a good data plan is the preliminary sketch of the health system described in Chapter 2. Collecting data should be neither a random process nor an indiscriminate harvest of every number in sight; both are wasteful of effort. Knowledge of what actors exist in the health system helps to focus health accountants' time and resources on the most likely sources of information, without necessarily limiting the scope of their exploration.

6.08. This phase of the NHA process is another where the existence of a steering committee is useful. Whether the data needed for the health accounts already exist or must be collected, it is likely that some form of persuasion will be needed. A well-connected steering committee can help to identify potential data sources. Its members can open doors in ministries and agencies and secure the cooperation of those staff and their managers. The steering committee can also advocate the collection of new data before the statistical authority and the budget authority.

6.09. The data plan should focus on several questions. For each of the dimensions of the health accounts, the plan should indicate which data sources are to be contacted, and who is responsible for that contact. The plan should indicate what types of information are needed, including the time period covered and the desired detail of the data. The plan should also include a tentative timeframe within which the data will be acquired, although this time line will almost certainly change many times as the availability of the data is explored with the sources of those data.

6.10. It is often the case that the inventory of data covers greater detail than that intended for publication. The goal is not to construct some kind of gigantic matrix, but rather to support the process of identifying whether all regional, local or extrabudgetary units provide information, and to better understand the working of the system and the records generated by each unit or group of agents. It is quite possible that data requirements for the health accounts will change as a result of the information generated in this process, as the actual coverage of the data is documented and the need established for imputing missing values.

6.11. The inventory of data should be comprehensive. It should include all government entities, including those whose activities or benefits are not available to the general public (for example, the ministry of defence). It should also include non-profit institutions and large private actors known to provide or subsidize health insurance for their employees or to deliver health services directly to their employees or to the public.

6.12. Part of the process of acquiring data may well involve outreach and education efforts on the part of health accountants and the steering committee. This activity is useful not only for uncovering new data sources and contacts, but also for "selling" the concept of health accounts and improving the quality of participation by respondents in the generation of data. Box 6.1 (see page 70) provides a real-life example from Rwanda showing how health accounts can be improved when the health accountants move from a passive role to an active role in the collection of data.

6.13. A general word is in order regarding international organizations as information sources. The African Development Bank, the Asian Development Bank, the Caribbean Development Bank, the European Investment Bank, the European Bank for Reconstruction and Development, the European Union PHARE and TACIS programmes, the Inter-American Development Bank, the Islamic Development Bank, the International Monetary Fund, the OPEC Fund, the World Bank, the intergovernmental agencies supplying analysis of the social and economic structures of Member States (including the World Health Organization, United Nations Children's Fund, the International Labour Office, the Council of Europe, and the Commonwealth Secretariat) all produce reports that describe and promote advanced governance principles. These organizations are rarely primary sources of data; with a few exceptions, they provide

Box 6.1
Improving survey response for national health accounts in Rwanda

This experience of the health accounts team in Rwanda illustrates how survey results can be improved by an education campaign. As part of the health accounts exercise, a broad-based steering committee guided systematic and extensive data collection activity.

In September 1999, a first round of questionnaires was sent to 268 entities active in nine different categories of the health sector. After three months, only 30% of the questionnaires had been returned and the validity of the information was not satisfactory. In response, the Ministry of Health, in collaboration with international partners, organized a three-day workshop attended by representatives from the public sector and a one-day workshop with external organizations. The purpose of these workshops was to discuss the need for national health accounts in the context of health sector reforms. At the conclusion of the workshops in January 2000, 268 questionnaires were re-sent to all entities. A team staffed by the Ministries of Health and of Finance helped public sector entities complete the questionnaires. As a result of this assistance, the overall response rate increased to 54% by March 2000, and the questionnaires were better completed.

Low response rates nevertheless persisted among private practitioners and employers. The low rate may be attributable to fears that any information submitted might be used against respondents by tax authorities. The workshops and follow-up visits to improve information gathered from central-level government entities were not very successful, in part because respondents lacked information systems that would allow them to provide data on health-related revenues by source and on expenditures by line items and functions. As a result of these outcomes, a decision was made to gather data at a more aggregated level, such as personnel costs, drugs, and other recurrent costs.

The experience of the Rwandan health accounts team highlighted gaps in the information system and increased policy-makers' awareness of the importance of correct information for policy formulation. An important result was an increased effort to develop a management information system and to improve financial management in the Rwandan health system.

secondary evidence, and they tend not to enter into much detail. Nevertheless they remain of value to the health accountant, by pointing to data sources containing country-specific or subject-specific information and by reporting on newly-developed or modified methodological guidelines. Some of them also help with methodology to reach particular objectives — for example, the Global Forum for Health Research publication, monitoring financial flows for health research *(6)*.

6.14. The search for and assessment of data sources is a never-ending task. Data sources come and go over time, and their quality changes as well. Every few years, it is appropriate to reassess each and every data source, table and classification, and output. In between those comprehensive reassessments, the health accounts staff should constantly probe for new data sources as institutions and financing arrangements change. The data plan should reflect resource availability, staff experience, and the availability of options such as resources to establish new surveys, the potential to amend existing surveys, or use of anecdotes and other types of non-stochastic data to prepare rough estimates and adjustments and to lay the groundwork for better and more systematic data collection in the future. Data plans will evolve as the estimation process goes forward, but having a preliminary structure in place is essential for efficient work of the health accounts team.

An overview of data sources

6.15. Three aspects of each data source should be considered when assembling the data used to build a country's health accounts: the origin of the data, the reason for data collection, and the level of detail of the data. Each of these has implications for likely data quality, appropriateness and sufficiency.

6.16. The origin of the data has implications for their usefulness in NHA. Table 6.1 (see pages 77 and 78) characterizes the data by their origin. These characterizations are very general, so each data set should be evaluated on a case-by-case basis and re-evaluated periodically.

6.17. The second attribute of a data source is the reason for which the data were collected. The motivation has important implications not only for accuracy, but also for bias, as shown in Table 6.2 (see page 79). As with characterization by data origin, the strengths and weaknesses attributed to these categories of data are general and each data source must be evaluated on a case-by-case basis.

6.18. Not only are data captured at different points in the flow of funds from source to final use, they also are kept at different levels of detail (granularity). This aspect of the data is important because of its implications for data storage and for the volume of data to be analysed: there are far more people to keep track of than there are providers, and even more events than there are people. For example, in the United States Medicare insurance system, 485,000 physicians treated 28,700,000 people in 1999, providing 850,000,000 covered services. In this case, maintaining records at the event level requires about 2000 times as much storage as keeping data at the provider level. Table 6.3 (see page 80) contains a general summary of this aspect of data.

What data are needed?

6.19. When cataloguing the data sets available, it is important to bear in mind that this is being done to populate the NHA matrices. This may seem self-evident, but the fact is that it is relatively easy to become sidetracked by interesting data sources or the desire to repair weaknesses in a dataset, thereby losing track of the real goal of the exercise. To populate the tables described in Chapter 5 requires data that provide information about each of the dimensions of those tables.

6.20. Alternatively, one can think in terms of the various actors in the health system, and organize data collection along those lines. The list of actors that follows is not mutually exclusive, but rather intended to map out what needs to be considered when assembling data sources.

6.21. *Government entities* can fill any of the roles in the health accounting framework. They can be a source of funds, a financing agent, or a provider of care. Often, an entity can fill more than one role at a time. Therefore, the data need to capture where government entities get their money from, to whom they give it, and whether they provide funding, reimbursement, or actual services (or some combination). If the entity does more than simply fund other entities, then the data also need to capture the types of goods or services for which expenditures were made and the beneficiary populations for whom the expenditures were made.

6.22. *Employers* also can fill any of the roles in the framework. They may pay taxes to social security funds and premiums to social insurance funds, they may reimburse employees for household spending, or they may provide services directly to employees and their dependants. In a number of middle-income and low-income countries, employers also fund non-profit institutions. The health accounts data need to capture the different types of outlays employers make, and what those outlays were for.

6.23. *Households* pay taxes and insurance premiums, and also make out-of-pocket payments for medical services. They may also receive money in the form of reimbursement for outlays they have made, and the data sources must be able to capture these flows of money as well. To examine the distribution of spending among various subsets of the population, something will need to be known about the household — its income, for example, or its total spending on all goods and services during the year.

6.24. *Nongovernmental organizations and external organizations* can be financing sources, financing agents, or providers of care. As with government entities, it is important to know where their funds come from, to whom funds are given, and the types of goods and services provided or purchased on behalf of consumers.

6.25. *Insurance companies and insurance funds* typically serve as financing agents, but in some countries they also operate their own facilities. As with other actors, it is important to know where these insurers get their funds from, and how and to whom those funds are disbursed. The nature of the insurance has to be understood — is it government social security, private social insurance, or voluntary medical insurance purchased individually? It is also important to know about the operations of the insurers: how much is spent on administration and how much is retained as surplus.

6.26. *For providers of care,* it is important to know what kinds of services or goods they produce and who pays them to produce those services or goods. Data that show to whom the services were provided and what was used to produce them tend to be rare, and health accountants who have access to such data are fortunate.

6.27. *For consumers of goods and services,* information is needed about the social, demographic, economic, and health characteristics of beneficiaries of spending. Knowledge of the level of spending by the beneficiary unit and of the types of insurance coverage available to it also matters greatly for good health accounts. The frequency with which such data are produced will play a large role in the decision about how often to produce the tables showing the distribution of spending among these populations.

6.28. For any of the actors listed above, the goal should be to have information on monetary amounts at the very least. Knowing something about units of service is useful for validity checking and triangulating estimates (cross-checking estimates from different sources). Knowledge of assets of providers or insurers can help a little in checking the reasonableness of estimates, and may be critical if policy-makers ask for a table showing the capital stock of the health system (a subject not discussed in this *Guide*).

6.29. In short, when collecting data on any actors, it is important to keep in mind four questions: Who are these actors? Where did they get their funds? To whom did they give those funds? What did they receive in return? With those four questions in mind, the next chapter treats data issues associated with particular actors in the health system.

Assessing the quality of a data source

6.30. The health accountant's work involves more than simply gathering data, just as the profession of the entomologist is more than just catching bugs. Like the entomologist, the health accountant pursues elusive and fragile subjects. And like the entomologist, the health accountant must catalogue what has been captured, examine their characteristics, compare them with other known species, and eventually decide whether or not they are valuable additions to the collection.

6.31. Deciding whether to use a data source is critical to the success of a NHA exercise. Accuracy and comprehensiveness in health accounts are not simply a function of the quantity of data available in a

country. The most substantial contribution to error in published estimates is not the lack of data, but the uncritical use of available data, or the failure to consider all available sources. Conversely, the most substantial contribution to high quality estimates is an understanding of which data to use, when to use them, how much to rely upon them, and how to adjust them.

6.32. This remainder of this chapter focuses on how to assess the quality of a data set. To some extent quality, like beauty, is in the eye of the beholder, but there are also some very pragmatic dimensions along which it can be gauged. For the purposes of this discussion, data can be separated into two types: survey data and non-survey data.

Quality of survey data

6.33. Survey data play a critical role in the estimation of national health expenditure. Typically, they are the major source of information about household spending on health care (and may also provide significant amounts of information about other dimensions of the health accounts, such as provider and financing agent activities or disease prevalence). Given the importance of the household sector, it is important to enter into use of survey data prudently, because misinterpretation of such data is probably the single most important cause of error in NHA. Making reliable expenditure estimates with survey data requires an understanding of the potential pitfalls in the use of these data and familiarity with methods to overcome their inherent weaknesses.

6.34. Because Chapter 8 is devoted to a detailed discussion of surveys, the discussion here will remain fairly general. Roughly speaking, the quality of a survey as a data source is tied to three attributes. These attributes are sampling error, non-sampling error, and sample frame bias. Evaluation of a survey's quality for health accounting purposes involves consideration of its survey design and — possibly — examination of specific subsets of data for purposes of data verification. Thus, it is important to have access to the design and instruments used, as well as to the data sets themselves. A survey whose instrument and design are not available for examination is greatly reduced in value unless some evaluation of its reliability can be made.

6.35. Any time data are collected from fewer than all of the units of analysis (called the universe or the population), there is a potential for misstating the true nature of things. This potential for misstatement is called "sampling error" and comes about because the survey statistician uses information about observed units (the sample) to infer information about other, unobserved, units (the rest of the population). The concept of sampling error leads to the notion of a "confidence interval" for the estimate — a range within which the statistician is "95% sure" the true population value lies. Clearly, the smaller the confidence interval the better the survey results are for health accounting. Thus, the quality of a survey can be measured in part by the sampling error it brings with its results.

6.36. Although sampling error is well discussed in the survey literature, and a great deal is made about the confidence intervals around a point estimate, there are other, more insidious, dangers in the use of survey data in health accounts. These threats are generally referred to as non-sampling error and can be divided into two classes, which can be called (loosely) "not asking for what is wanted" and "not getting what was asked for". While it is impossible to eliminate non-sampling error completely, there are ways to design and implement the survey that can help to minimize that error.

6.37. Non-sampling error is present to some extent in any survey. Understanding the potential for this error and minimizing that potential are important parts of survey design and implementation. Because non-sampling error affects the quality of the survey for NHA purposes, the survey process and survey instrument should be studied carefully, preferably in consultation with survey statisticians, to understand the potential size and direction of such error.

6.38. Sample frame bias blends sampling and non-sampling errors, but is important enough for national health accounting purposes to warrant its own discussion. Any survey provides definite information only about those entities or people actually surveyed — the survey statistician must infer the characteristics of the rest of the population based on the characteristics of those surveyed. Uncertainty about the size of the whole population (the "universe") introduces two kinds of problems. First, if it is not clear who is in the universe, there can be no assurance that each member has an equal chance of being selected. This throws into doubt the estimate of sampling error. Second, if there is uncertainty about who is in the universe, it is almost impossible to generalize, or inflate, survey results to represent the whole population. For example, a survey of 75 nongovernmental organizations is of diminished quality if the total number of such organizations in the economy is unknown: by how much should the survey results be multiplied to get a national total? By 10 or 25 or by some other factor?

6.39. A second form of sample frame bias relates to the type of respondents selected for survey. If the sample respondents are not representative of the population as a whole, the survey is of diminished quality. For example, a survey of a sample of urban households, however excellent, is of little help in estimating spending by rural households. A survey of a sample of large firms is useful for estimating health spending by all firms only if it can be assumed that small firms spend nothing or that they spend the same amount per employee or per wage unit as large firms. Careful consideration of the way in which the sample was drawn (or is to be drawn) is needed in order to assess the quality of the survey results for the health accounts.

Quality of non-survey data

6.40. Non-survey data come from a wide variety of sources. Government budget data, government special reports ("white papers"), insurers' administrative data, trade association annual reports, academic research, business case studies, are all examples of this type of information. So too are qualitative research documents, focus group results, data from convenience samples and opportunistic data. As different as they all are, there is a common set of questions that can be asked to assess the quality of these sources for a country's health accounts.

6.41. *How complete is the base upon which the source is built?* Government budget data, at one extreme, probably capture all money appropriated for use by the government entity. At the other extreme, anecdotal evidence may consist of an interview with a single respondent. Clearly, the wider the net is cast the more likely it is to bring in a good representation of what is in the sea. Unfortunately, there can be no rules of thumb to deem a source to be inclusive enough: practice and experience — and the advice of others — will lead to an intuitive "feel" for that aspect of data quality.

6.42. *Does the data source or sponsor have an agenda to push?* Very often, data are assembled or created to advance a particular argument or agenda. It does not require that the sponsor or compiler of the data be deliberately deceptive in order for the data to be of poor quality; it is enough that compilers stop looking once they have found a piece of evidence to support their position. Data that conveniently buttress one position or another in a political debate are not necessarily wrong, but their provenance and assembly should be studied very carefully before they are added to the stock of raw material from which the health accounts are built.

6.43. *How were the data assembled?* Was the collection process a rigorous one, or did the compilers accept all entries without question? Did they actively look for pieces of data, or simply sweep up what was close at hand? Is there evidence of an attempt to review the results critically, or simply to document and release the information? Once again, there are no rules of thumb for assessing this aspect of a data source's quality: personal experience and the advice of colleagues are the only guides.

6.44. *How homogeneous are the entities about which the source provides information?* This is somewhat akin to the confidence interval concept for survey data. If there is reason to believe that all the entities in the universe resemble one another closely, then the rigour of the data collection process becomes less important. Unfortunately, there is often no way to assess the homogeneity of the universe without some type of analysis, in which case the non-survey data would not be needed! However, enough anecdotes and indirect evidence from other sources can help to develop a partial picture of the subject universe sufficient to make a tentative guess about its homogeneity.

Choosing among alternative data sources

6.45. Earlier in this chapter the three types of situations were described which confront the health accountant: no data on a subject, one source of data, or more than one source. In the latter case, as often as not the data sources present different pictures of the subject, leaving the question of which to believe.

6.46. Clearly, better quality data sources are to be believed more than poorer quality data sources. That assessment is, however, never straightforward, and is often circular in nature. There are some additional factors that should be considered when choosing among data sources, as listed below.

6.47. *Congruence with boundaries and classification schemes.* Which data source is better aligned with the definition of health care laid out in Chapter 3 and with the classification schedules being used to distinguish among flows of money? Do the labels used by the data sources capture the true nature of the activities or transactions recorded?

6.48. *Congruence with time period.* Which data source more closely fits the time period covered by the health accounts? For example, is one source several years old? Or does one report fiscal year figures and the other calendar year figures? Does one source measure budgeted amounts and another measure actual expenditures?

6.49. *Congruence with content.* Which data source more closely conforms to the concepts being measured in the accounts? For example, does one source measure stocks and another measure flows?

6.50. *Congruence with monetary measure.* Does one measure inflation-adjusted expenditures and the other nominal expenditures?

6.51. *Congruence with geopolitical borders.* Do the various data sources cover the entire nation completely and without overlap?

6.52. One way to resolve conflicting or divergent data source reports is to look for overlapping confidence intervals. These confidence intervals can be rigorously defined, as in sample surveys, or more loosely constructed in the case of non-sample data. If the two (or more) intervals overlap, the health accountant is entitled to suspect that the "real" value being sought lies inside that overlap area, and thus to shrink the ultimate confidence band around the estimate. The result is far from stochastic — that is, it lacks the rigour of the formal confidence interval of sampling theory. But it does provide more than one chance of being correct, and it can help in explaining the accounts to sceptics who suspect biased analysis.

6.53. Another way is to use the conflicting data sources to establish an upper and lower bound on the estimate. Subsequent use of the matrix process described in Chapters 9 to 14 can help to find the most plausible figure in that range.

Concluding thoughts on the choice and use of data

6.54. The choice and use of data to produce health accounts are critical. Poor selection of data or their inappropriate use can undermine the accuracy and reliability of any health accounts. Like a professional woodworker, the health accountant's job involves not only selecting the right tool for the job, but also selecting the best materials for the project. Wood that is appropriate for one use may be totally inappropriate for another.

6.55. Understanding the data is fundamental to high-quality health accounts. Even when what is being measured seems totally obvious, it is important to confirm what is included and what is excluded from the scope of the data. Suppose that budget documents of the ministry of health show spending for hospitals, but fail to indicate that the state-owned electricity utility provides free electric power to those hospitals. Taken at face value, the ministry of health figures will understate the true cost of providing hospital care; it is through careful examination of the budget documents, including discussions with ministry of health staff, that the need to impute utility consumption in the accounts is likely to emerge.

6.56. Finally, it is imperative to remember that each entity that provides data is composed of discrete parts. This is true of households, which comprise several family members. It is true of firms, which have marketing, production, and accounting departments. And it is true of government entities, which have policy divisions, operations divisions, and finance divisions. The quality of any data received, regardless of the care taken in any other aspect of its collection, hinges directly on who provided the information. Asking accountants about the types of patients seen in the hospital, for example, is far less effective than asking medical directors the same question. On the other hand, asking medical directors about revenue sources is often pointless — one must go to the accountant for this kind of information. In short, the quality of the collection tool must be weighed with the quality of the respondent.

6.57. Simply discarding poor-quality data is not necessarily the best course of action. Using incomplete data, data that are not comparable over time or over space, data that reflect inadequate handling of price movements or of currency exchange rates, or data that reflect manipulation of credits and debits, all distort the potential usefulness of the health accounts. Such data can, however, serve as a useful point of departure. Complementary information may be available to identify the extent and direction of the bias, and harnessing the strength of a source with a potential bias while controlling for the effects of the bias is an art expected of health accountants. If nothing else, the data can be labelled as inadequate for health accounting purposes and the reasons for that recorded in the file for future reference.

6.58. As part of the health accounting process, records should be created and maintained that document the quality of the data used and not used. Notes about the nature of anecdotal or indirect evidence can be used to explore paths that may lead to more documented or direct evidence in future cycles of the health accounts.

6.59. The role of the health accountant in the statistical system does not stop with the provision of matrices or tables. It often includes a commentary on the figures therein and even a report to facilitate the interpretation of the tables and the indicators obtained from these tables. With tact, the accountant may discuss the incompleteness of data sources, their partiality, and their biases.

6.60. No health accounts system has succeeded in marshalling all desirable sources in one, two or even ten cycles. In many countries, "benchmark" revisions are carried out periodically, allowing health accountants to integrate new and improved sources of data. Health accountants must not "let the better be the enemy of the good": they must make do with the data at hand while continuing to press for new and improved data sources. As elsewhere in the process, they must document their findings and decisions about data quality as part of the permanent record of the health accounting process to aid in a cycle of continuous improvement.

Table 6.1 Strength and weaknesses of data sources, by origin of data

Origin	Strengths	Weaknesses
Government records • Budget expenditure • Economic censuses and surveys • Tax reports • Import and export statistics • Reports on transfers from external resources	• Most accessible of the different types of data • Reliable and accurate • Comprehensive coverage of the relevant activity • Available on a regular basis • Consistent reporting rules	• Official or unofficial barriers to data raised, attributable to government security practices (such as Armed Forces hospitals and dispensaries' accounts) • Data distorted or misrepresented to protect or advance a program • Data disaggregated into categories dictated by regulation expenditure control (which often differ from the provider or function categories required for health accounts) • Audited data accessible with considerable lag
Other public records • Ministry of health annual reports • Financing and regulatory agency reports • One-time documents such as task force reports, white papers, parliamentary commission reports • NGO reports or studies • Academic studies • International agency reports	• Rich in details, focusing on specific issues • Frequently comprehensive for relevant cells in tables • Information collated for a specific enquiry that may otherwise not be regularly monitored	• Typically focused on single dimensions - restricted geopolitical, demographic, socio-economic, epidemiological scope • Variable analytical rigour • Classifications may not match those needed for health accounts
Insurer records • Individual companies • Industry association • Special analyses of tax records or other official reporting requirements	• Restricted to medical care and related expenditures • More rapidly available after the end of the fiscal year than government budgetary reports	• Frequently weak on functional detail • Exclude co-payments, deductibles and other patient financial liabilities • Absence of centralized information system or financial reporting • Unwillingness to share proprietary data • Difficulty in keeping track of all organizations in a rapidly-changing market makes it difficult to estimate an industry total

Table 6.1 Strength and weaknesses of data sources, by origin of data (continued)

Origin	Strengths	Weaknesses
Provider records • Financing and regulatory agencies (administrative records and surveys) • Industry associations • Special analyses of tax records	• Specific and comprehensive for relevant cells • Records contain little spending that falls outside the boundaries of the accounts	• Difficult to assure that all providers are represented by data • Rapid turnover in small providers makes surveying difficult • Incentives exist to inflate expenditure claims in financing systems with reimbursement and to under-report taxable revenue • Basic records may not be adjusted when tax and other authorities "correct" for fraud • Reporting classifications designed for administrative and auditing purposes, not economic accountability
Household surveys and records and related reporting • Censuses and surveys • Academic and non-profit institution studies • Marketing studies	• Cross-classification with relevant demographic, economic, social and other payer and user characteristics • The only source of information on spending that occurs in the "grey market" • Detail on liabilities available only indirectly through other sources	• Sampling and non-sampling errors in reporting can present major challenges to analysis and accuracy • Patient not always aware of the full cost of medical services records • Records relating mainly to personal medical services, few details may be usable to approximate the value of collective and public health services

Table 6.2 Strengths and weaknesses of data sources, by reason for data collection

Reasons for collection	Strengths	Weaknesses
Budget data	• Typically focus on functions or activities that are directly related to health accounts • Subject to enough scrutiny that the figures can be considered reliable, especially for executed and audited figures	• May be deceptive in terms of completeness — not including every type of expenditure that might be assumed to be included • Can be very aggregate in nature, not amenable to analysis
Administrative data	• Usually complete and non-overlapping • Commercial self-interest can be a powerful force to ensure maintenance of high quality data, especially for private entities	• Reporting entity may be reluctant to provide commercially valuable data • Reporting entity may be reluctant to provide data that could be used against it by regulators
Tax or other data mandated by regulatory agencies	• Can be quite reliable if taxation is well enforced • Even if financial data are not available or are inaccurate, non-financial data may be reported accurately to health authorities • Likely to be most thorough in coverage of private entities	• Usefulness of tax data is directly related to the audit or other quality assurance measures used by the tax authority • Regulations can often create incentives for entities to report particular outcomes, which biases data reports
Research or survey data	• When survey is properly carried out, respondents have no incentive to bias their answers • Studies can be specially tailored to collect data specifically for health accounts, providing specificity that is not typical of other data sources	• Potential for unintentional reporting biases • By definition, not routinely produced, leading to estimation gaps and problems with comparability over time • Expensive to design and conduct

Table 6.3 Strengths and weaknesses of data sources, by level of detail (granularity) of data

Granularity	Strengths	Weaknesses
Event level • Associated with specific transactions (for example, insurance claims data are mostly event-level data)	• Very useful in linking expenditures to some patient characteristics (such as age and sex), to diagnoses and to interventions	• Can be difficult to collect, process, and analyse • Do not easily provide information about overhead and infrastructure development
Person level	• Usually more comprehensive in coverage than event-level data • Often connected with social, demographic, and economic characteristics	• May not capture all costs involved in treatment of an individual (such as overhead, capital spending, and administration) • May not capture all contacts with the health care system
Provider level	• Can be complete in coverage of costs involved in the production and delivery of specific services	• Often lack distributional information or data on the characteristics of patients treated
National level • Includes ministry budget reports and similar types of information	• May be more complete and accurate than data of other granularity	• Typically lack any descriptive details useful to health accounts

Chapter 7

A guide to non-survey sources of data for national health accounts

7.01. The preceding chapter provided an overview of the main data sources and how they may be linked to different dimensions of the health accounts. This chapter provides a more detailed guide to non-survey sources of data. It is organized according to the main types of institutions or entities in the health accounts, as these are most frequently the places where the health accountant goes to collect the required data. Chapter 8 deals with surveys related to the various entities.

Data on government entities

7.02. In most countries, government data sources provide the greatest wealth of information of any source available, but they may also pose subtle traps for the health accountant. The sheer mass of government data may mask differences of definition and operational differences between governmental and national health accounts (NHA) practice, and the complexity of government transactions introduces a risk of double counting or undercounting health expenditure (or both).

7.03. Government expenditures for health as a rule can be obtained from government budgetary records. Often, budgetary and revenue data[10] are available from finance ministries, finance commissions, and other auditing bodies in more detail than is published in public documents. For that reason, establishing and maintaining a good working relationship with such agencies should be an early priority. Ideally, arrangements would be set up to ensure access to advance copies of documents, and to the actual electronic records where relevant.

7.04. Among the early tasks in the preparation of the NHA — one that never ends — is the enumeration and evaluation of all the various reports that could bear on health spending and financing. Dozens (perhaps even more) of such reports may appear each year, and an analysis is required for each one of them. Do they track central/federal, state/provincial/regional and local/municipal health expenditures? Is social insurance considered? Are special expenditures, such as poverty health programmes, included? Are ministries that engage in health care spending, other than the ministry of health, included? Are external resources included? Are parastatal firms included that provide health care to their workers (whether as a specific additional benefit or as part of compulsory social protection)? Are transfers to nongovernmental organizations included? Are debt payments by the ministry of health, included? Are health-related expenditures of universities and other public organizations included? When the content of data is analysed, specific definitions should be determined for each category listed. For example, do personnel expenditures include both active and inactive (retired) staff? Does the health function include non-health social services, such as social insurance? Do expenditures include the value of in-kind benefits and cash benefits? Are the data in sufficient detail to enter into the accounts framework, or must they be adjusted for timing, definitional, or other differences?

7.05. Government budgets are typically highly structured, and often exhibit considerable stability in organization over time. This aids systematic compilation of such data in a database. Although the granularity (level of detail) available in budgetary records can be variable, generally speaking the greater the level of disaggregation by programmatic purpose the better. The ideal situation is where programme budgeting is the norm in the government sector and is detailed enough to disaggregate all government health expenditures into single elements of spending associated with a single functional use and single provider type (for an example of this, see Box 7.1).

[10] On the revenue side of government ledgers, the proceeds of taxes and contributions may be earmarked for health. If this is the case, those figures should be collected for use in developing the financing sources by financing agents (FSxFA) table of the health accounts.

Box 7.1
Use of provider and function keys to code government spending in Sri Lanka

The Family Health Bureau in Sri Lanka's Ministry of Health has multiple responsibilities for coordinating and implementing maternal and child health services in the public sector. Much of its budgetary resources are used for purchasing and distributing supplies to lower-level facilities (Ministry of Health units) in all provinces of the country, but some are also used for centrally delivered services. Despite this, in the government budgetary reports, only its combined total spending is reported. Expenditures therefore need to be disaggregated and coded twice, by providers and by functions. Since total expenditures are known, this involves a two-stage estimation of the distribution of spending — first according to centrally run programmes and provincial programme support, and then (at the provincial level) by function. The total budget is eventually disaggregated into more than 25 different expenditure items, each given its own provider and function codes. An excerpt of the resulting data is shown below.

Provider code	Provider	Function code	Function	Regional code	Amount (Rs. millons)
18121	Family Health Bureau	61100	Maternal health	1	7.853
18121	Family Health Bureau	61200	Infant and child care	1	12.580
18121	Family Health Bureau	61300	Family planning services	1	52.137
16110	MOH[a] units, WP[b]	61100	Maternal health	11	4.001
16110	MOH[a] units, WP[b]	61200	Infant and child care	11	6.409
16110	MOH[a] units, WP[b]	61300	Family planning services	11	26.561
16111	MOH[a] units, CP[c]	61100	Maternal health	12	2.798
16111	MOH[a] units, CP[c]	61200	Infant and child care	12	4.482
16111	MOH[a] units, CP[c]	61300	Family planning services	12	18.575

[a] Ministry of Health. [b] Western Province. [c] Central Province.
Note that the regional code refers to the geographical target of spending, and is used to develop the subnational breakdowns of spending that are required in the Sri Lanka national health accounts (SLNHA) (1 is national, 11 is Western Province, 12 is Central Province). All codes refer to internal database codes used in the SLNHA database. They are not used for publication of results, when the corresponding SLNHA classification code is used.

7.06. Government budgetary systems may classify expenditures using a functional classification system that is not consistent with health accounting definitions, or that is not sufficiently detailed. When this is the case, the health accountant must sift through expenditure items to identify which expenditures are for health and which are not, as well as which expenditures can be assigned to which health functions. This, in turn, requires thorough documentation of those decisions, not only for the benefit of analysts who will be replicating the work in future years, but also to explain to budget analysts why the estimates of national health expenditure differ from the "official numbers".

7.07. The International Monetary Fund (IMF) reports functional expenditure data for central governments, which, although too aggregate for health accounting purposes, can be of great use in developing the health accounts. The IMF reports can lead to the original source in the ministry of finance or the central bank, excellent starting points to get a good grasp of the funds of central (and sometimes subnational) authorities that are earmarked for health. As with other reports, however, many governments report to the IMF under each heading only what the ministry most concerned spends — an institutional or main activity classification rather than a functional classification, notwithstanding its label. Simply using the IMF data in such cases generates the risk of both omission of health spending by other ministries and inclusion of non-health spending by the ministry of health.

7.08. Data on financial flows through treasuries should be tapped and analysed for NHA purposes, as should those from the central statistical office or any other agency that has previously attempted to

create a health row in the national accounts or has classified central and general government data according to their economic purpose (final consumption expenditure, subsidies, transfers, investment and other capital outlays).

Actual or estimate?

7.09. An important consideration with government budgetary records is the distinction between anticipated spending, executed spending, and audited spending. Budgetary estimates of anticipated spending, of course, may never materialize, or may be subject to overruns or underruns. Estimates of executed spending, although more solid than budget estimates, may be subject to revision as later data become available. Audited accounts of actual government expenditures are the most reliable, and in theory are preferable to data on projected or unaudited spending. When data are not customarily published, for example in the form of parliamentary reports, they can usually be obtained from audit agencies.

7.10. There is, however, a time cost to using audited data. There is typically a 1–2 year delay between the end of the fiscal year and the availability of data on audited actual expenditures. Waiting for these data can reduce the timeliness of the health accounts. Generally, the most practical solution is to use provisional (unaudited) figures on executed budgets. In many budgetary systems, such figures are released well before the final audited version and are sufficiently close to the final numbers that it is possible to use them instead of final audited figures without substantial loss in reliability. If there is a consistent pattern to the relation between provisional numbers and final numbers, that pattern can be reflected by adjusting the provisional numbers before incorporating them in the accounts. As a time series of NHA estimates evolves, "provisional estimates" for a year can be made using provisional data, and then revised as more complete data become available. In practice, many countries' health account estimates for a given year are labelled "preliminary" when they first appear, "revised" a year later and often become final only after two years. Sometimes, new information emerges several years after accounts are considered closed and from time to time benchmark revisions that integrate these new data are completed.

Comprehensiveness of data collection

7.11. In compiling data on government health spending from budgetary records, health accountants must be attentive to the fact that health expenditures are not confined to the health ministry, nor to expenditures already classified for administrative purposes as health. Ministries of finance frequently release expenditure data using an institutional rather than a genuinely functional classification, in which all ministry of health expenditure is allocated to the health function, even though some of that spending may apply to social programmes for children, youth, family, and so on — spending related to better health but defined to lie outside the boundaries of the health accounts. Conversely, institutional classifications may omit from the health category sizeable programmes conducted through ministries of education, housing, agriculture, and so on, or through special boards. For this reason, it is important that the NHA project have access to people who have a thorough knowledge of the working of health policy in the country and who can identify programmes that should or should not be included in the NHA.

7.12. In some cases health accountants may face resistance from "protected ministries" whose expenditure figures are considered sensitive or classified. These expenditures still need to be included in national health expenditure, as they represent a part of the nation's care of its citizens. Several countries have accomplished this by aggregating spending categories so that no sensitive information is divulged. Transparency is an objective of a public accounting system, but comprehensiveness and consistency can be achieved without compromising other goals of society.

7.13. Comprehensiveness also requires an investigation to ensure that all reports are obtained. It is not uncommon for governments to issue separate reports on current spending and capital spending, or to issue separate reports detailing external resources or spending under specific programmes.

Subnational authorities

7.14. Collecting data from subnational authorities can present a number of challenges. The most common one arises when expenditures by subnational authorities are not reported in the consolidated budget reports of the central government. This can present difficulties in access to data, since data must be collected separately from every governmental level of authority. In some cases, the large number of government authorities involved may make it impractical to collect data directly from all of them. In these circumstances, surveying a sample of subnational governments should be considered. For example, health accountants in the United States rely on estimates derived from a census of all government units conducted every five years; in between, annual reports from each state government are supplemented by a survey (conducted by the central statistical authority) of a sample of lower-level governments. A similar strategy is being used in Sri Lanka, where annual updates of the NHA depend upon a sample survey of the lowest subnational authorities.

7.15. Many countries with decentralized governmental systems have arrangements for intergovernmental fiscal transfers. A good understanding of these arrangements and how they relate to funding of government health services is important when it is time to assign the funds to a particular financing agent.

7.16. As mentioned earlier, IMF reports, central statistical offices, and other agencies engaged in the analysis of public expenditure often possess consistent data for state/provincial/regional and for local/municipal authorities. Such data should definitely be considered for inclusion in the health accounts, although the health accountant should still conduct a consistency check on them.

Data on social security, social insurance and voluntary medical insurance

Social security

7.17. As with government budgetary data, data on the executed financial operations of social security schemes are relatively easy to obtain. By definition, social security is mandated, and mandates usually imply a minimum level of financial reporting either to government agencies or to the public. For the purposes of the NHA, information is required both on the sources of revenue (to construct tables on financing sources), and on actual expenditures. Often the information readily accessible conforms to administrative and statutory reporting requirements, but much of the time data are kept at a level of detail that permits aggregation according to the economic classification schedules used in the health accounts.

7.18. In collecting data on sources of revenue, care must be taken to distinguish tax subsidies, employer-paid premiums, employee or household premiums, and investment income. Each of these types of resource flows is treated differently in the health accounts. If the flows are not differentiated in the data source, they should be estimated by kind of benefit and by scheme, using information about applicable laws and regulations.

7.19. Social security may involve decentralized schemes that should be accounted for. For example, the law may mandate coverage of state workers under specific risk pooling institutions and facilities, while private-sector workers have special arrangements under the same law but with different institutions. In the German system, the law requires membership in a sickness fund, but does not require that each

sickness fund be open to all members of society. Country arrangements may provide for multiple co-existing social insurance schemes, each one of which should be treated as described in the preceding paragraph. In addition, careful monitoring of cross-financing flows between these schemes must take place to avoid improper counting of subsidies, transfers, loans and debt write-off among the schemes that do not result in an expenditure on health.

7.20. Difficulties can arise with social security when the schemes involved are highly fragmented and there is no centralized reporting of financial operations. In such a situation, the options are either to institute regular reporting mechanisms through official action, or to survey existing schemes. Depending on the programme, insurance agencies are capable of providing quite detailed information on the distribution of expenditures by types of provider, types of service reimbursed, and broad beneficiary group. These may require special tabulations of existing data, in which case the cost of those tabulations should be built into the budget of the health accounts project. The objective is to clearly disaggregate the monetary value of benefits from other gains or losses, as well as to separate the financing agent and provider functions of the institutions examined.

7.21. The scope of the insurer's operation can present another difficulty. For example, social security benefit may not conform to the boundaries of health care defined in Chapter 3, requiring work to eliminate the monetary value of the benefits that fall outside the boundaries (sickness insurance is often accompanied by income-loss benefits, which should not be counted as national health expenditure). If the social insurance agency engages in other lines of business, such as commercial insurance, care must be taken to separate as far as possible the money flows associated with these different lines of business. This is needed to avoid distorting the picture of the health care system and to avoid counting the same money flows in two different places.

7.22. Broader social accounting reports may be of help to health accountants. The European Union and the OECD are developing social protection accounts that identify a range of benefits (most notably sickness, maternity, and accidents); the International Labour Office, as part of its monitoring of the cost of social security, has begun to encourage extension of that approach to other parts of the world. (Several Eastern European countries are already reporting along these lines, although using other classifications and reporting frameworks.) This work is useful because health accounts overlap with different ways of calculating social spending more broadly. For example, workers' compensation, an element of social protection, may include health expenditure. Similarly, health insurance may include spending for income support for sick beneficiaries – a type of expenditure that lies outside the health accounts boundary. The international organizations mentioned are working to standardize these concepts and measures, to make it possible for most countries to introduce similar concepts and principles in their own accounting schemes. At present, publications in these areas at the international level are not sufficiently detailed for use in health accounting, but they indicate the existence of sources that the NHA team may wish to use.

7.23. It may be possible for social security funds to provide data on patient co-payments associated with covered services. If so, the quality of those estimates should be explored, as they could be a source of information to verify consumer information coming from other sources.

Private insurance companies: social insurance and voluntary medical insurance

7.24. From a conceptual perspective, private health insurance may be the most difficult segment of the health care system for which to acquire data. In many countries the insurance industry is evolving rapidly, with a bewildering variety of insurance products available. Often, health insurance is available in forms other than the conventional liability insurance contract (which has the main or sole purpose of reimbursing beneficiaries against medical expenses). Examples include health insurance as a rider to life insurance policies, and health insurance as an additional benefit for holding a credit card. Where medical

insurance is offered by general or life insurance firms, it may not be treated as a separate line of business, and administrative data may only report these expenditures aggregated under less specific insurance headings such as miscellaneous or general insurance. At the other end of the spectrum, some benefits provided by medical insurance policies fall outside the boundaries of health as defined in Chapter 3. For example, it has already been mentioned that payments made to compensate an injured worker for lost income are not health care spending; separating these income benefits from medical benefits at the data source is preferable to making a guess at the split later on.

7.25. In some countries, the lines between social security, social insurance, and voluntary medical insurance are blurred. As defined in social accounting, *social security schemes* are those required by law. *Social insurance* (sometimes called group insurance) includes those schemes where enrolment is restricted to subsets of the population; typically, to be covered one must be an employee (or retiree) of a sponsoring firm or a member of a sponsoring trade union or association, or a family member of such a person. *Other private health insurance*, often called voluntary medical insurance, is potentially available to any member of society, although often there are physical or medical conditions for enrolment (see also paragraph 4.06).

7.26. Insurance companies may handle two or even all three types of insurance. In such cases, data sources need to be able to distinguish between the three types, to avoid double counting flows of insurance premiums. Health accountants must familiarize themselves with institutional and legal descriptions and analyses of the industry so that they can convert administrative records into meaningful economic flows. Even so, they are bound to discover intricacies that require a deeper analysis of institutional and regulatory features than those readily available.

7.27. The quality and level of detail of private insurance company data are correlated with the maturity of the market. Some data on the insurance industry may be available from routine sources. For example, government and regulatory agencies may collect official statistics. Countries with an established private insurance market may have a chamber or association of private insurance companies that can centralize data at a high level of detail. Private surveys by insurance brokers or employee benefits consultants may be available for use in the accounts. These data sources often provide a very low level of detail, however, such as the number of firms operating in the market, total premiums and total claims, and number of policies issued, but not a breakdown of claims by type of service. In other countries a private insurance market has only recently been introduced. In the latter countries, rapid turnover in the entities participating in the market and rudimentary regulation of the market can combine to make private insurance data relatively more dubious.

7.28. Where available data are insufficient, primary data collection through surveys is usually necessary. The goal of such collection is to have information about the allocation of expenditures by types of service and provider, and by type of beneficiary. One role of the health accounts steering committee is to use the authority or influence of its members to persuade industry bodies or the national statistical authority to carry out such a survey. Delegating responsibility for such a survey is usually wise, because the task of designing, funding, and conducting a survey can be quite burdensome. In collecting aggregate insurance expenditures, the survey must be constructed to include all relevant insurance products in the sampling frame, and - if multiple types of medical insurance exist - to make appropriate distinctions.

7.29. Insurance firms may be able to report aggregate premiums and claims from their medical insurance business, but they may not collect claims data by type of service or by type of beneficiary. When their internal information systems cannot yield such data, one solution is to examine a representative sample of insurance claims records and extract the data directly.

7.30. It is important to collect data in the correct time frame. Often, insurance data are reported on a cash basis, which reflects when benefit payments are actually made to the provider or policy-holder or when premium payments are actually received. Unless it is impossible to use an accrual method of accounting (see paragraph 3.14), figures should reflect when the covered services or goods are provided or when the months covered by the premiums occur. Sometimes cash flows can differ significantly from these incurred measures, so it is important to understand which set of numbers has been provided. Typically, incurred figures are calculated by actuaries at the level of the individual insurance firm, but they may require some additional effort to obtain. As is always the case in health accounting, it is important to document the basis (cash or incurred) of the data used.

7.31. In the NHA, there are two different spending measures related to private insurance. One is a measure of total incurred benefits, disaggregated by type of provider or by type of service. The other is a measure of earned premiums. The difference between these two measures reflects administrative costs, additions to reserves, and retained surpluses. Data are required on all of these constructs in order to complete the NHA tables.

Data on firms and employers

7.32. In their capacity as employers, firms make several kinds of payments on behalf of their employees. One kind is social security premiums, which typically are mandated payroll taxes. These payments are best captured by direct data collection from the social security agencies themselves, as this aggregation reduces the data collection burden on the health accounts team. Differences between the system of national accounts (SNA) and the NHA in the treatment of employer contributions for social security and social insurance should be kept in mind if SNA sources are used for these categories of spending. (In the SNA these contributions are treated as supplements to wages and salaries, essentially making them household income; in the NHA they are treated as a financing agent activity of the employer, not the household.)

7.33. The degree of employer involvement in health care activity tends to vary by industry. More mature and stable industries tend to be more likely to offer non-wage benefits. Sometimes, the type of health expenditure made or the insurance offered is related to the nature of the industry. For example, when a high proportion of workers are female, reproductive health services might be routinely covered, even when this is not required by law. Industries that involve worker exposure to lead, asbestos, and other toxic elements may have monitoring and abatement programmes in place that should be accounted for as on-site health services. If resources do not permit systematic sampling of employers, a deterministic survey of industries might be useful. The establishment of contacts between the health accountants and industry groups is very useful.

7.34. Data collection challenges related to employers mainly arise regarding voluntary payments employers make for employees or their dependants. There are four categories of this type of expenditure:

- employer expenditures for on-site health services (acting as a financing agent);
- employer payments to outside providers for delivering services to eligible beneficiaries (acting as a financing agent);
- employer payments to employees to reimburse them for medical expenses they paid out of pocket (acting as a financing agent);
- employer expenditures to purchase health insurance coverage (whether social insurance or otherwise) for employees or dependants (acting as a financing source).

7.35. There are a number of potential routine data sources that can be used to make estimates of these expenditures. The government may conduct routine official surveys of employee benefits. When the survey is sufficiently representative and the questions are sufficiently comprehensive, this can be a reliable

and sufficient data source. Even when official surveys are not available, private organizations such as employer federations or insurance consultants may conduct surveys, often to establish industrywide estimates of employee compensation before setting or negotiating new compensation scales. Larger firms may keep track of their health expenditures, or may record intermediate purchases such as pharmaceuticals that can be used to approximate that expenditure. The existence of such data sources should be probed, with the recognition that if the data relate only to specific types of firms they will need to be supplemented using other sources.

7.36. Surveying firms for health care spending is very difficult, and should be done in consultation with national statistical authorities. In addition to the general survey matters reviewed in Chapter 8, the following statistical and data aspects are especially important in surveys of employers.

7.37. *Sampling.* Firms are often difficult to sample because of lack of any established and reliable sampling frames. This is especially true of small firms, which may come and go faster than the tracking ability of the government authorities. It is frequently the case, however, that small firms make little or no expenditure of the type discussed here, in which case weak or nonexistent surveys are not a problem. At the same time, larger firms, which are more likely to make such expenditures and more likely to keep records of that spending, tend to be more stable and easier to find.

7.38. *Double counting insurance expenditures*. If firms use insurance schemes to provide medical benefits to their employees, then any data collection instrument needs to distinguish between direct payments to providers and payments made to insurance companies. This is done to avoid counting the money involved once when the firm pays it to the insurance company and again when the insurance company pays it to the provider.

7.39. *Double counting household expenditures.* Similarly, if employers reimburse their workers for some medical expenses incurred by the workers' households, then the data collection instrument must be able to identify such payments. This helps to avoid counting this money both under employers (appropriately) and also under households (inappropriately) as financing agents.

7.40. *Lack of detailed cost data.* It is unlikely that any survey of employers will provide detailed breakdowns of health care spending (such as type of provider or type of service). Typically, this distribution must be estimated separately. For example, where employers reimburse employees for purchases of health care, it may be possible to tabulate a sample of claims submitted to those employers. Where employers contract with or employ providers, it may be possible to infer the type of expenditure from the nature of those providers.

Household data

7.41. There are two reasons to be concerned about data on household spending for health care. The first is the importance of the household as a payer. Based on observations gathered during the 1990s in middle-income and low-income economies, household (or out-of-pocket) spending is often second only to government expenditures in terms of size and share of total health spending. Indeed, where there is no social health insurance, out-of-pocket spending can account for between one-third and two-thirds of total health expenditures (*The world health report 2002*, Annex Table 5). It is in out-of-pocket spending that inequalities in the financial burdens of the health care system are most likely to appear.

7.42. The second reason for concern is the difficulty of acquiring good estimates. With the exception of small amounts recorded by government providers as user fee revenue, most of these expenditures are not reported in routinely available provider statistics or other administrative data sources. The number of

households in a country, their mobility, the wide range of their socioeconomic and demographic characteristics and of their spending patterns, coupled with frequently tight budgets for data collection faced by governments, typically result in data on household health expenditure being a weak link in the chain of official government statistics.

7.43. The most common and important source of information about households is a survey. A properly designed and conducted survey can provide valuable details about households' health spending as well as their composition and distributional characteristics. But misinterpretation of household survey data is probably the single most important cause of error in NHA estimations. Even a properly designed and conducted survey can lead analysts astray.

7.44. Although most health accountants rely heavily on survey data for their household estimates, other sources may be of use as well. In fact, when a significant household survey is available or there is the potential for carrying one out, health accountants may be lulled into a false sense of security and feel inclined to prefer it as a major source of information to the compilation of many different pieces of information from other sources. Yet other sources of data, such as those mentioned below, may be more accurate and reliable in measuring different elements of household spending. They often have the added benefit of routine collection and of validation over time.

7.45. One source of information may be provider records. To the extent that providers collect patient payments and keep their business accounts in a way that allows those payments to be identified, these data can be a cost-effective way to triangulate (cross-check) or substitute for a household survey. Unfortunately, such data are typically aggregated at the provider level, and so do not capture the demographic detail that can be found in a survey.

7.46. Similarly, insurer records can be used to generate estimates of household co-payment amounts or of amounts reimbursed to households by insurers. Applying co-insurance rates to benefit payments can establish a first estimate of co-payments, although an allowance must be made for patients defaulting on payments and for deductible amounts as well as co-payments. Correcting household expenditures for amounts received as reimbursement from insurers or public programmes has proved to be an important part of developing a more realistic model of the actual health care financing system. These transfers must be considered in both household survey design and other complementary data collection to avoid large errors in estimation.

Data on providers

7.47. Collecting data on providers poses challenges similar to those posed by collecting data on financing agents. On one hand, the problems may be even greater, because of the number of providers involved.

7.48. On the other hand, estimates of provider activity may be more readily available from other national authorities than is the case for financing agents. Staff engaged in activities related to the SNA, such as estimation of gross domestic product or preparing input/output tables, are interested in the same types of measures as health accountants, and aggregate estimates they have already completed may be of use in preparing the NHA.

7.49. Even when this is the case, the health accountant's work is not done. Where the definitions and boundaries used for health accounts differ from those used by the SNA staff, adjustments to the estimates will be needed. The basis of the estimates created by the NHA staff should also be evaluated. Health care spending is only a modest part of a country's total economy, and SNA staff may have other priorities in their work that would result in their giving less attention to health expenditure than NHA staff would be prepared to give.

Government sector providers

7.50. In certain situations, it may be necessary to supplement data from government budgetary documents with data collected directly from government providers. This can happen when budgetary documents omit certain items of expenditure or income, or when additional information is required on the use of expenditures, for example to allocate spending to specific functions.

7.51. In some countries, government facilities are empowered to collect revenues (such as user fees) from non-budgetary sources without having to report all such revenues to the government. In these circumstances, facilities must be surveyed to obtain details of such revenues. In the case of user fees, this information can be used to triangulate the estimate generated from household surveys. Nevertheless, national and local cost-sharing arrangements vary greatly cross-nationally, as do the instruments developed to monitor them, making it difficult to suggest a single rule.

7.52. In most government hospital systems, budgetary documents will only record the total budget allocated to the facilities. In tax-funded systems with fixed budgets at the facility level, cost-accounting systems within facilities are usually not available - there is little need for them. If the health accounts are to disaggregate expenditures by function of use, then additional information will be required. Special cost studies are needed to disaggregate spending, for example, into inpatient and outpatient services. If resources do not permit conducting cost studies in all facilities each year, then data from a sample of facilities can be used to estimate cost ratios for all other facilities. The data would need to be updated on a regular basis (subject to resource availability).

Private sector providers

7.53. Estimating income of and expenditures at private sector providers is a common challenge, except in countries that rely predominantly on insurance mechanisms for funding health care. With insurance-based systems, the health accountant can often rely on data provided by insurance plans on their payments to providers. In other countries, the health accountant must rely on reconciling information based on demand-side data (for example, household surveys) with that derived from supply-side data. It is often not easy to obtain such supply-side data from private providers.

7.54. *Private hospitals.* There are a number of potential sources of administrative or routine data that might be used to obtain estimates of private hospital revenues. These include information reported to tax authorities, financial statements provided as part of licensing requirements to agencies registering private companies, and routine data collected by hospital industry associations. The existence and availability of such data sets must be determined, and whether they are reliable sources of information. It may be possible to arrange for industry bodies to collect this revenue information if they are not already doing so. If routine data are not considered reliable or do not exist, there is usually no alternative but to survey private hospitals. The information collected in this manner must also be subjected to the standards of evaluation described earlier (see paragraphs 6.29 and following).

7.55. *Private practitioners.* Private doctors (and other private practitioners) present greater challenges than private hospitals because of their greater number and smaller economic size. Tax records do exist in some countries, but unreliability of such data is commonplace, owing to incentives to underreport income. Revenues can sometimes be estimated indirectly, for example, when patient charges and volume are known; this is the case when third-party payers, such as social security and other prepaid financing, are predominant. Often, though, the only practical solution is to conduct surveys to estimate the revenues of these practitioners. Obtaining the cooperation of practitioners often is not easy; providing stringent undertakings of data confidentiality and obtaining the cooperation of professional associations will help, but are no guarantee of success. Compounding this problem, there may not be a good sampling frame

for the private practitioner population, which greatly complicates the survey process. If surveys are not feasible, an alternative is to use Delphi techniques, where knowledgeable informants are asked to provide estimates.

7.56. *Pharmacies and medicine retailers.* Collecting data directly from pharmacies or other retailers of medicines presents challenges similar to those described for private doctors. One option may be to use the national accounts estimates. Another may be to use reliable industry estimates of retail sales if such already exist; this is done in Hong Kong Special Administrative Region (SAR) of China, as well as in Malaysia, Sri Lanka and the United States, where health accountants use data collected by a private company when estimating pharmaceutical sales.[11] Pharmaceutical firms need accurate data to plan marketing strategies, and thus there are strong commercial incentives for generating high quality data. Private trade associations and market research firms may be obliged by the legislation of countries in which they operate to share part of the information they collect when the bulk of the sales are to government entities. Elsewhere, they may make aggregate information accessible at no or token cost to health accountants or non-market agencies facilitating the compilation of health care accounts. In many cases, however, purchase of data on audited and non-audited markets is prohibitively costly, and trade associations may be reluctant to share information when their interests could conflict with health accounts used to monitor and evaluate the market. In any case, as with any other data source, the reliability and accuracy of the data collection methods used to create any third-party estimates must be evaluated before those estimates are put to use in preparing the health accounts.

7.57. If estimates are not available, or if they do not fit the definitions of the health accounts, another option is to generate production-based estimates of retail sales of medicines (see Box 7.2). This requires an understanding of the production and distribution channels for pharmaceuticals in a country. If reliable data are available for production, import and export of pharmaceuticals, estimates could be prepared of the value of pharmaceuticals in a country at factory or import prices. However, to estimate retail sales requires making estimates of the mark-ups at all stages in the distribution system, as well as the value of purchases by non-retail users. If data do not exist, it may be possible to collect them by conducting special surveys, for example of pharmaceutical importers and producers. This method can be subject to considerable inaccuracy because of difficulties in obtaining reliable data. For example, trade data may not capture illegal trade in pharmaceuticals, there may be incentives to misreport factory production, and mark-ups may be difficult to quantify.

Box 7.2
Estimating spending for prescription drugs in Bolivia

In Bolivia, household spending for prescription drugs was estimated using the equation

HE = NP + I - HIFE - PSE - CIE - NGOE - X,
where:
HE = household expenditure;
NP = national production;
I = imports;
HIFE = health insurance funds expenditure;
PSE = public sector expenditure;
CIE = expenditure by supplies provisioning centre + essential medical supplies expenditure;
NGOE = nongovernmental organization expenditure; X = exports.

Metadata may be the source of information on imports, exports and national production values of pharmaceuticals. Budgetary and institutional records are almost always available for public entities, and often for larger private institutions (both providers and financing agents, such as private medical insurance). Even where household surveys are the primary source for estimates of household spending for prescription drugs, this type of equation can be used to verify and adjust the various figures reported.

[11] Among the various third-party databases useful for health accounting, IMS is a health pharmaceutical market information research firm which operates in more than 100 countries.

Data on local and international nongovernmental organizations and other external organizations

7.58. Non-profit nongovernmental organizations operate in most health systems. In some cases, they operate health care facilities; or they may engage in public health activities, or finance health research. What distinguishes a non-profit nongovernmental organization (also called a non-profit institution serving households, in the terminology of national income accounts) from a private firm is that most of its revenue is derived from private and external sources and most is spent in non-market activity. What distinguishes it from a government organization is the absence of a controlling government influence on its operation. Nongovernmental organizations can be indigenous local organizations, or local representations of larger international nongovernmental organizations.

7.59. Typically, it is difficult to obtain data on nongovernmental organizations. The organizations tend to work independently of each other, and record-keeping and reporting practices are comparatively weak (except for the largest organizations). The degree of national supervision varies considerably from country to country. Some governments require detailed reporting and approval of expenditure; in other countries nongovernmental organizations (and even official external resource providers) operate with great autonomy and little official control. There may be a public or private organization that tracks these entities, and if so that organization could be an extremely useful contact. The government may keep a registry of nongovernmental organizations for tax purposes or other regulation, which could provide valuable insight into the relative size of such organizations and the focus of their activities. That registry could also serve as a sample frame should a survey of nongovernmental organizations be undertaken. Finally, there may be academic sources of information about the nongovernmental organization sector, as that sector is often of interest to academic economists, sociologists, and business schools.

7.60. When examining government expenditure accounts, care should be exercised to isolate transfers from public budgets to nongovernmental organizations. These funds are treated differently in the health accounts from direct spending by government, and it is important to avoid double counting them when aggregating the various financing agents in the summary tables.

7.61. The classification schedules introduced in Chapters 3 and 4 help to group together the activities of external resources in a country's health system. These external resources include official development assistance, such as bilateral aid programmes and loan programmes, where the government is one of the parties to the agreement. They also include activities of international nongovernmental organizations such as the Red Cross or Red Crescent, Doctors without Borders, Pharmacists without Borders, Project Hope, Caritas, the Salvation Army, Oxfam, Save the Children, and so on.

7.62. Accounting for expenditure flows relating to external resources can be difficult. Although many countries in theory have mechanisms to monitor aid disbursements, challenges are posed by the manner in which many international assistance activities are funded and by the lack of standardized reporting systems across organizations. The complexity of financing arrangements also complicates the development of usable data. If international assistance is significant in the country's health economy, collection of this information — in aggregate and with the appropriate detail — may involve substantial effort.

7.63. Several generic challenges arise when measuring external resources. Often, external organizations incur expenditures that they do not report to national authorities or that may not be covered under formal bilateral cooperation agreements. In the case of official development assistance these unreported expenditures can include central administrative costs incurred by the external agencies themselves in administering assistance to countries, and funding to contractors who are based outside the country but provide services to the country's health economy. Official development agencies may maintain financial control systems designed to meet the demands of their own national authorities, and there is considerable diversity in the financial data available at different organizations. Financial expenditures may be reported using different fiscal years, data may not distinguish between actual and obligated expenditures, and accounts will typically be maintained in some foreign currency.

7.64. There are a number of potential data sources related to external resources, and these will be discussed in the next few paragraphs. Experience indicates that in most countries there will be discrepancies between these sources in regard to the expenditures reported. The reason for such discrepancies must be investigated and the relative reliability and comprehensiveness of each data source determined. This will involve collection of data from all major sources, and careful analysis of data from each source for specific projects. Although considerable effort may be required initially, once reliable data sources have been identified subsequent rounds of estimation will be easier.

Government expenditure accounts

7.65. Budgeting rules in many countries require that international assistance to government programmes be recorded at full value in the financial accounts for the relevant programmes or departments. Ideally, such financial flows are recorded both on the revenue and expenditure side of public expenditure accounts. Cash transfers are recorded in the equivalent national currency; assistance in kind is valued at some appropriate monetary value, such as the national price of the good or service involved. Unfortunately, in many countries the ideal is not met, and the lack of rigour in adhering to formal accounting and financial reporting rules render these budgetary data unreliable. In such cases the health accounts team must look elsewhere; if no other data are available, they must do the best they can to adapt the data to the accounts framework and hope to triangulate the estimate using other elements of the accounts.

Government records on external assistance

7.66. Some countries require all external financing assistance to be reported to a central government agency. This requirement may be strengthened in some cases by legal requirements that all external financing assistance to any local entity be approved by such agencies. These reporting systems are subject to the same completeness and reliability problems outlined above for government budgetary records. Where such data do exist, they typically relate to amounts disbursed in a given year. Additional data may, however, be needed to identify the specific health components, and to classify expenditures by health function.

Routine surveys of external financing assistance

7.67. Often there are routine annual surveys of all external financing assistance activities in a given country. These may be carried out by local United Nations Development Programme (UNDP) offices or – in the case of health sector assistance – by World Health Organization (WHO) offices or health ministries. UNDP usually releases such information in published report form, but the data are only as reliable as the reports submitted by individual organizations. UNDP also maintains the Development Cooperation Analysis System (DCAS) database containing information on the funding agency, recipient agency, annual disbursements and general purpose of individual projects (see below). The adequacy and accuracy of DCAS data should be checked against data from other sources before deciding whether additional or alternative information is required.

7.68. The OECD Development Assistance Committee (DAC) monitors official international assistance by fourteen OECD countries, through the Creditor Reporting System (see below). The OECD Secretariat publishes this information in the form of annual reports, and the data can be considered reliable. However, DAC data may not be disaggregated sufficiently or detailed enough for health accounting purposes. DAC data may also not be informative on expenditures that are not channelled through bilateral country assistance programmes. Consequently, they are more often an indicator of where to look for data than a source of data themselves.

Special surveys

7.69. In the absence of reliable routine data, a survey of external financing agencies is needed. In that survey, organizations should be asked to provide information on all projects they support, with details of annual disbursements, recipient agencies, and sufficient information to allocate the money spent among providers, functions, or target populations. Some organizations (such as the Japan International Cooperation Agency) publish reliable annual data on their country activities, and direct surveys may not be necessary when these reports are available.

7.70. Unlike other financing sources, external financing expenditures can be extremely variable from year to year, because assistance is tied to specific projects. As a result, surveys of a sample of organizations should not be used to estimate trends in spending; a complete survey (essentially, a census) of all major organizations is needed. This implies that it is wise to explore formal mechanisms to obtain such data on a routine annual basis. If a survey is conducted, it may be useful to recruit the assistance of key organizations, through the influence of the NHA steering committee. Support from the — or even delegation of responsibility to — WHO or UNDP can be effective in some contexts. For example, the NHA project staff might work with UNDP to modify existing DCAS data returns and collection procedures.

The Development Cooperation Analysis System

7.71. The Development Cooperation Analysis System (DCAS) is a computerized, searchable database of development cooperation projects (both multilateral and bilateral). It is maintained by UNDP and includes project descriptions and objectives, the beneficiaries, executing institutions, commitments and obligations, disbursements, classification types, current project status, related projects, and so on. The quality and completeness of the data nevertheless varies by country. If the DCAS is available, it can be accessed in the local UNDP missions. In some countries (Sri Lanka, for example), UNDP has installed the DCAS on the health accounts team's computers.

The Creditor Reporting System

7.72. The Creditor Reporting System (CRS) is an information system comprising data on official development assistance, official aid and other lending. Data are collected from the country members of the Development Assistance Committee, from the World Bank and from regional financial institutions. The system is sponsored jointly by OECD and the World Bank, and operated by OECD.

7.74. The CRS is essentially a project information system. Data are collected on individual aid activities of more than 60 aid agencies. The amount committed, the purpose, the terms, and other information are shown for each activity. Database coverage varies somewhat between donors, but in general the coverage is high regarding loans and capital aid grants. By contrast, a number of reporters do not supply data on technical cooperation, or cover it only partially.

7.74. The CRS as an information system lends itself admirably to statistical compilations and analysis. Its concepts and definitions are the same as in the DAC reporting system. Consequently, the data can be analysed in association with the annual aggregate statistics of the DAC. The CRS is the major source for statistics on the purpose and geographical distribution of aid as well as the terms and conditions of aid. Data are published both in electronic and paper format in CRS regional reports and the CRS online database (part of the International Development Statistics Online databases), and all of CRS data are available in .csv format in the International Development Statistics CD-ROM.

7.75. A subset of the CRS consists of official and officially supported export credits, as well as loans categorized as "other official flows". These data also pertain to individual activities, but they are confidential. Aggregate data can be made available on request concerning a given creditor country's transactions with all recipient countries (or with major groups of recipient countries) or, conversely, those of a given debtor country with all creditor countries (or with major groups of creditor countries reporting to the CRS). This part of the CRS database is also the foundation of the statistics on the external debt of countries.

7.76. Although the CRS is a good source of information, the data should be used with care. It is important to note that the figures typically reflect commitments (agreements with the aid recipients) rather than disbursements (actual expenditures). Committed funds often are disbursed over the course of several years, and health accountants must determine or estimate the pattern of disbursement. They must also distribute the disbursements into greater functional or provider detail, using other data as an aid in this activity. For these reasons, CRS data are most useful as a roadmap for exploring external flows and their effects on the country's health system.

Summary

7.77. Data come in all forms and in all stages of readiness for inclusion in the health accounting process. It is often paradoxically true that better information is available for the small actors in the health system than for the large actors. The general lists of data sources reviewed in this chapter should be seen only as a guide for the health accounts team as they prepare their data plan. Interviewing key informants is a crucial part of the identification of data sources, and health accountants will find that one source leads to another.

7.78. Filling data gaps may require specific data collection. Usually, public expenditure records are easily found for the ministry of health and for social security entities. Nevertheless, as NHA tables are to be filled with specific distributive figures, complementary studies may be necessary for the following specific types of entities:

- Other ministries — covering at least the central government agencies known to have health programmes, such as ministries of education and defence.
- Firms (including parastatal firms) — the information should focus at least on the major spenders on health (whether or not they own health facilities and include resources involved in health care payments.
- Universities — information is needed on programmes and activities directly offered to the population as health goods and services; training for health services personnel can also be included under the proper classification label.
- Special task forces and programmes.
- Specific sources of resources, such as lotto, external entities, cost-sharing payments;
- Funds and activities of external entities.
- Nongovernmental organizations.
- Private medical insurance.
- Private health providers.
- Households.

7.79. It is impossible to overemphasize the never-ending nature of the search for data. Complacency in this regard can seriously reduce the accuracy and utility of the accounts.

Chapter 8

Developing and using surveys in health accounts

8.01. A central activity in health accounting is the generation and use of data collected through surveys. Administrative records and other recurrent reports provide a huge share of the information desired to construct health accounts, but they typically provide little information about the transactions of households, non-profit organizations, private medical insurance, specific public entities and external financing agencies. For this type of information, health accountants often must turn to primary data collection — survey data.

8.02. Survey data are an important source of information on actors with an important role in total health spending, and must be used very carefully. Making reliable expenditure estimates with survey data requires understanding the potential pitfalls in the use of these data and familiarity with methods to overcome their inherent weaknesses. Survey data are valuable only to the extent that they can be assumed to reliably reflect the reality of a country's health system.

8.03. The validity of data rests on the way in which the data are generated. There is a clear trade-off involved in data collection in any information system, including health accounts. On one hand, the more comprehensive is the data collection, the more it costs to undertake and the longer it takes to complete, whereas the typical health accounts project has little money and is asked to produce results quickly. On the other hand, small-scale non-random surveys can cost very little to undertake but often produce results that cannot be generalized to the population as a whole, whereas health accountants are asked to produce information about the whole population in a way that supports informed policy decisions. The art of the survey is to strike a balance between cost, timeliness, and quality.[12]

8.04. Surveys come in a variety of sizes. At one end of the spectrum are censuses and large-scale random surveys. These are capable of providing good coverage of the subject population and can be very accurate. There is a well-established body of literature on designing and conducting these types of exercises. But these studies require considerable resources, which are not easy to mobilize in low-income countries. As a result, WHO, the World Bank, and other institutions have worked to develop approaches to small-scale surveys and simplified selection procedures. The techniques of rapid assessment and rapid evaluation, or similar methods, may provide an answer to data needs in countries where the health accounts budget cannot stretch to censuses and large-scale surveys.

8.05. This chapter deals with three ways in which data can be collected: a survey of the universe (a census), a survey of a random sample, and a survey of a non-random sample. In each of these three categories, data collecting has implications for the validity, reliability and nature of the information gathered. The resources available for health accountants (see Annex A) include a sample of specialized material for readers interested in a more complete treatment of the subject of surveys.

Census data

8.06. If data collection were arrayed along a spectrum from most complete to least complete, census data would be at the "most complete" end. In a census, each and every unit in the population (alternatively called "the universe" in the jargon of statisticians) is sought and surveyed for the information being collected. In theory, everything is known, and nothing must be guessed. Population censuses and economic censuses are well known examples of this type of data collection, but there are others. Government budget documents that reflect every government unit and every expenditure made by those units also are censuses.

[12] An anonymous policy analyst once phrased the balance thus: "We do good, fast, cheap work (choose any two)."

8.07. In practice, a complete census is usually impossible to attain, especially those that collect data from households or businesses. The universe itself can change during the course of a census, and some of the units may hide or be missed by enumerators. The units missed during a census are usually qualitatively different from those enumerated, and some effort must be taken to adjust even census results for undercounts of the population. For this reason, it is quite possible for a census to be of poor quality, and census methods should be reviewed before accepting the results as authoritative.

8.08. A census is at the high end of the spectrum in terms of completeness and is also at the high end of the cost spectrum. A census is complex to organize and execute (except when the universe is very small), and most statisticians agree that there is much information for which census collection is not cost-effective: a survey of a random sample may provide even more accurate results at a fraction of the cost. Nevertheless, at some point there has to be some type of census — to establish the size of the universe, if nothing else.

8.09. Very often census results arrive too late for direct use in the health accounts. It can take years to complete and tabulate a census because of the complexity surrounding its design and execution. Given that policy-makers more often want to know what will happen next year rather than what happened five years ago, steps must be taken to adjust the census data to bring them "up to date". This can be done by applying growth factors to the census data based on assumptions about determinants of that growth.

8.10. The message for the health accountant should be clear. When a good-quality census is available, it should be used; tardiness notwithstanding, the comprehensiveness of a census is an asset. However, when no data for a specific entry are available, using a census to collect that data should be considered only when the population is small and heterogeneous (for example, when the population comprises external organizations that finance or deliver health care and related services in the country). Under other circumstances, surveys of a sample of the population are cheaper and faster and, in the case of random samples, may even be a more reliable representation of the universe.

Random-sample surveys

8.11. Surveys of a random sample of the universe are very well known. In fact, the term "survey" has almost come to be associated with the random sample. In this type of survey, a certain number of respondents are chosen from the universe to receive the survey and their answers are "generalized" to the rest of the population. Each member of the universe has a known probability of being selected for the sample, a probability equal to that of every other similar member of the universe. An entire body of literature is devoted to the process of designing and drawing a sample and to the inferential statistics that come from the resulting survey. Rather than attempting to distil that body of literature to a handful of paragraphs, this *Guide* concentrates on various aspects of random-sample surveys that are of special importance in health accounting (see Box 8.1). These comments are intended to facilitate a discussion with survey experts about existing or proposed work to be used in the health accounts.

Box 8.1
Aspects to be evaluated when considering a survey for use in building health accounts

Several aspects of any given survey should be evaluated before its results are used in the health accounts. Each bears on the reliability, validity, and generalizability of the results: What is the margin of error? How well does the survey measure the concepts of interest? How well do the results characterize the population as a whole? These aspects are:

- Rationale for survey
- Sampling design and sampling error
- Non-sampling error
- Sample frame
- Detail and specificity of questions
- Mode of administration
- Feasibility of cross-checks
- Access to survey instruments and data sets
- Regularity of survey

Rationale for survey

8.12. When evaluating a survey as a source of data for the health care accounts, it is important to consider the principal reason for the survey. Surveys fall into two broad categories. One category includes surveys conducted for general or multiple purposes; these collect a broad range of data, including some that bear directly on the construction of health accounts. The central statistical authority often conducts such surveys to establish employment and unemployment characteristics and rates, household consumption patterns, economic production, and so on. Such surveys are standard (though not universal) to establish price indices and to estimate national income and product accounts.

8.13. The second category consists of surveys conducted to collect information on specific topics. The subject may be health status, production and use of medical services, expenditure on medical goods and services, and so on. These types of surveys are more commonly conducted by academic institutions, nongovernmental organizations interested in the health system, and analysts engaged in health system evaluation or reform.

8.14. Each of the categories has relative merits. General household expenditure surveys have two principal advantages. They are commonly conducted on a regular basis by national authorities for the purpose of compiling general economic statistics, and record expenditures other than those to be included in national health expenditure; this may be helpful in adjusting the survey for non-sampling error (discussed below). General-purpose household surveys also provide information useful for ranking households by consumption status, an important element of national health accounts (NHA) tables showing spending by socioeconomic groups of the population.

8.15. The relative advantage of a targeted survey of the health industry or of health expenditure is its focus on the health system. In the case of household surveys, this focus helps to reduce recall bias (discussed below) and it can increase the level of detail obtained. Broader surveys do not collect much detail on spending for medical and paramedical care, that consumption being combined with other personal services such as recreation, or placed in a larger category with other expenditure items, for example cosmetics and hygienic products. By concentrating on health care and medical events, targeted surveys can reduce recall errors and, by definition, collect more detail. Targeted surveys are, however, susceptible to overreporting as respondents tend to "telescope" events (to report events that occurred outside the reference time period).

8.16. In the case of economic surveys, a focus on health care helps regarding sample size. Typically, surveys that cover the entire economy contain few health care providers in the sample, which is tilted toward entities with large revenues or large assets. As a result, these surveys are fairly weak in their ability to characterize activity in the health system. By contrast, an industry-specific survey that focuses its sample on health providers is likely to produce more robust results, provided that an appropriate sample frame for the universe of such providers can be found.

Sampling design and sampling error

8.17. The sampling design of the survey has implications for the generalizability of results, as well as for the size of sampling error. Surveys that are representative only of subpopulations or of selected regions should be avoided when preparing national estimates: those surveys are unlikely to be generalizable, that is, they are unlikely to reflect experience nationwide.[13] If nothing else is available, such surveys can be used, but only with great caution and with explicit adjustments to reflect assumed differences between the population surveyed and the population in general.

[13] Of course, such surveys can and should be used if the work focuses on that particular subpopulation or region.

8.18. The size of a sample has implications for survey accuracy. All other things being equal, the bigger the sample size, the smaller the sampling error. This makes intuitive sense: a larger sample requires information to be inferred for fewer members of the population, and there is less likelihood of being misled by one or two extreme cases drawn by chance. The more homogeneous is the population, the smaller is the sampling error. This too is intuitive: at the extreme, if everybody were exactly alike, the statistician would need to know about only one respondent to draw conclusions about the universe.

8.19. Sampling errors and their relationship to sample size are well understood by most survey users, and adequately discussed in most standard statistical texts. In well-designed surveys reports, sampling errors are reported explicitly, or can be computed easily. The size of such errors needs to be taken into consideration when survey data are used. When designing a survey, it is important that the sponsors discuss with the survey statistician the "power" of the survey and its ability reliably to capture infrequent events as well as frequent events.

8.20. Survey statisticians can also provide advice on stratification of the sample. In most, if not all, situations, it is useful to discuss subsets of the universe – for example, to characterize the experience of people in the worst health or of the greatest age, or to describe health spending patterns among small businesses. When at all possible, surveys should be stratified by characteristics believed to relate to probability and level of expenditure. For example, spending by enterprises for health care typically varies by industry, enterprise size, ownership (public and private sectors, foreign or domestic), etc. A survey of 250 randomly chosen small firms and 250 randomly chosen large firms (a stratified sample) can produce more reliable information about the small firms than a random sample of 500 firms of which 75 turn out to be small. Stratification allows development of a statistically valid average cost per employee in each stratum, which can be multiplied by the estimated aggregate employment in the strata (from the country's labour force survey) to produce a national estimate. In these situations, departing from a strict random sample and drawing respondents at random from population strata makes sense, because for the same cost the surveyor improves the robustness of the survey overall.

8.21. Sampling error leads directly to the notion of a "confidence interval" or "margin of error" for the estimate. Given the uncertainty inherent in any sample survey, stating with absolute certainty the exact value of the concept being measured in the population is not possible. It is, however, possible to establish a range for that value and to associate some confidence with that range. A statistician may, for example, state that "the average value of this measure is 45 in the sample, and I am 95% confident that the population value lies somewhere between 41 and 49". A confidence interval depends upon many factors, including sample size, how closely sample responses cluster, how confident the statistician wants to be, assumptions about the universe, and the nature of the sampling model (randomly chosen respondents, and so on). Confidence intervals can be constructed for any degree of confidence. Frequently, the 95% level is chosen, but this can be relaxed or tightened according to the consequences of errors for the estimate produced. Because the quality of a survey can in part be measured by the sampling error associated with its results, it is advisable to make explicit the magnitude of the margin of error so that those using the data to prepare the health accounts, and those using the health accounts themselves, can judge the values involved.

Non-sampling error

8.22. Although sampling errors are well discussed in the survey literature, and a great deal of attention is paid to the confidence intervals around a point estimate, there are other more insidious dangers in the use of survey data in health accounts. These threats are generally referred to as non-sampling errors and can be divided into two classes, loosely categorized as "not asking for what is wanted" and "not getting what was asked for". Eliminating non-sampling errors completely is impossible, but there are ways to design and implement the survey that can help to minimize those errors.

8.23. The case of "not asking for what is wanted" principally arises when survey respondents do not understand the survey questions. Subtle changes in the wording of a question, or in its placement in the survey, can affect how respondents understand the question. The surest way to reduce this type of error is to pilot test the questions with a small sample of respondents chosen to reflect the types of people who will eventually be surveyed and to carry out some qualitative tests such as debriefing individuals, inviting them to think aloud and so on. Pilot tests cost time and money and, unfortunately, that stage of the survey process is often skipped. An alternative to pilot testing in order to reduce this type of non-sampling error is the use of "off-the-shelf" questions that have proven to be effective in other surveys. Even then, it helps to validate the questions used because, even where populations broadly share the same culture, questions may be understood differently and small variations in the wording may be required to obtain comparable answers.

8.24. Non-sampling errors grouped in the class of "not getting what was asked for" deal with the unwillingness or inability of respondents to reply accurately. For example, respondents to industry surveys may underreport activity because of concerns about review by tax authorities or other regulators. Among households there is a reluctance to report contacts with illegal providers, grey-market transactions, or contacts for socially undesirable conditions or diseases. (In addition, it is not unheard of for respondents to "manufacture" events in an effort to please the interviewer.)

8.25. One of the most common problems in surveys of household spending on health care is recall bias - respondents cannot remember accurately how many events they experienced or when those events occurred. Recall bias has a number of different causes, which induce bias in both directions. Downward bias in reporting usually dominates the upward bias, and the net non-sampling error is negative. Recall bias varies with the length of the recall period, the nature of the item being recalled and the characteristics of respondents. It is largest for small, irregular payments, a frequent occurrence in regard to spending on medical and paramedical care, more so than is the case for other types of consumer expenditure; recall biases are thus a particularly important concern for health accounting, and for ambulatory care more so than for inpatient care.

8.26. Recall biases can be affected by the way in which the survey elicits information on health expenditure. General household consumption surveys usually ask respondents for the sum of expenditures on items of medical service or goods in a given time period. Specialized health surveys, on the other hand, elicit information by first prompting respondents to remember episodes of illness or use of different medical services during a given time period, and then to recall the expenditures associated with these. All other things being equal, the second approach elicits better recall than the first, although errors remain in either case. Respondents to a specialized survey may well "telescope" events, that is, they may report expenditures or services that occurred outside the time frame of the survey because they do not recall the exact date of the event.

8.27. Another common problem in getting what was asked for is lack of knowledge. Typically, one person completes the survey for his or her entire household or institution. That respondent may not know all the relevant information for other members of the household or institution. For example, a clerk in the hospital's accounting department may have little knowledge of the case-mix treated in the hospital, while the medical director has little knowledge of the total costs incurred by the hospital. Typically, surveys attempt to reduce this source of bias by probing for the best respondent and by encouraging help from other members in the surveyed unit. However, even the best possible respondent may simply be unable to reply accurately to the question; for example, patients may not know at all the cost of their hospital stay.

8.28. Different styles of interview affect non-sampling error. Some surveys are conducted by mail, others by telephone, and still others in person-to-person contacts. Some surveys employ a diary kept by a respondent. Each method has its advantages and disadvantages in terms of cost and ability to reduce

errors. These advantages and disadvantages are amply discussed in the professional literature and usually well understood by statistical officers with experience in conducting or supervising surveys. Beyond the aspects relating to survey theory, the experience in many low-income and middle-income countries has been that some of these techniques may simply be impractical.

8.29. Understanding the potential for non-sampling errors and minimizing that potential are important parts of survey design and implementation. These errors are present to some extent in any survey. Because the quality of the health accounts is affected directly by the quality of the underlying data, the survey process and the survey instrument should be studied carefully, preferably in consultation with survey statisticians, in order to understand the potential size and direction of non-sampling error. Further, that size and direction should be mentioned in the documentation that accompanies the health accounts, not only in the spirit of full disclosure but also as a reminder for future development work *(7)*.

Sample frame

8.30. Sample frame bias was discussed in broad terms in Chapter 6 (see paragraphs 6.38 and 6.39). The quality of survey results depends in part upon the extent to which the survey participants can be said to be representative of the universe of interest.

8.31. Even surveys deemed "nationally representative" may omit key groups of individuals. Frequently, national surveys do not cover institutionalized individuals or hospital patients. Such populations will tend to have above average health expenditures, so some type of special treatment of these populations may be needed. This may take the form of a targeted survey, which may be both expensive and difficult to implement, depending upon the form it takes (random or non-random). An alternative to the additional survey is ad hoc adjustment of existing survey results to account for the omitted populations. This is similar to the correction process for census data discussed above. For example, if a survey of the population of people living in urban settings produces an estimate of inpatient spending per capita of 50 and other evidence suggests that people living in rural areas spend half as much as urban residents spend, then it is possible to conclude that rural residents spend 25 per capita on inpatient care. This is a sort of hybrid survey result, not amenable to classic notions of confidence intervals, but it is the type of data adjustment characteristic of health accounting, as illustrated in work done in Argentina (see Box 8.2).

Box 8.2
Adjusting household survey results to eliminate bias in Argentina

Private household expenditures are an important share of total spending in most countries of Latin America. These expenditures are estimated mainly from survey data, but experience has shown that existing household surveys cover the urban population better than the rural population, and that there is a general underestimation of expenditure. Even with surveys specifically designed to highlight medical care spending, comparison with industry data suggest an underestimate of the expenditure level on pharmaceuticals. This may be attributable to the failure of surveys to define allopathic medicines, non-allopathic medicines, vaccines, and traditional medicines precisely enough; and to the fact that respondents may be more fully aware of hospital episodes and special journeys to consult a medical practitioner than of the associated prescriptions (all features that a survey re-design could help better to capture). Further, in many surveys some population groups are excluded by design.

In Argentina, efforts are being made to make the raw survey results more representative of national health expenditures. Adjustments that have been developed to correct specific biases include the following:

- Adjustments for non-covered geographical areas are made using demographic profiles by household type.
- Adjustments for households that did not reply to the survey are based on household income and their average expenditure.
- A final adjustment is made for general survey underestimation, based on line items and then distributed by income group and geographical area.

Detail and specificity of questions

8.32. Surveys differ in the level of detail collected about facets of health expenditure. Greater detail is better for two reasons. It permits disaggregation of spending by function and by provider, and it facilitates cross-checks with other information sources. The ideal survey would collect information on all expenditures related to the health system, and would categorize such expenditures both by provider and by function. In practice, such surveys do not exist and health accountants must be prepared to work with less complete sets of information. On the other hand, analysts should beware of false precision — asking for or reporting more detail from survey respondents than they are capable of knowing. Each survey must be evaluated to determine the extent to which it offers sufficient detail to support the primary and secondary analytical needs of the health accounting process.

Mode of administration

8.33. There are many ways to conduct a survey. Each has advantages and disadvantages. One way is to conduct the survey by telephone. When possible, this can be the least expensive method of surveying. Its disadvantage is that, by definition, population members without a telephone are missed. This jeopardizes the random nature of the sample and biases results against the poorer members of the population, who may have above average outlays or greater health care needs.

8.34. Another method is mailed or postal surveys. These are somewhat more expensive than telephone surveys, but have the advantage of being accessible to a larger proportion of the population. The disadvantages of a postal survey are, first, that it still may not reach all members of the population, such as those without a fixed address and those out of reach of the postal system. Second, postal surveys are less effective with illiterate respondents, who must either ask for help to respond or simply do not complete the form. Again, this can bias the results. Finally, there are no genuine checks to make sure that the right person completes the survey. For example, a postal survey of employer health spending could end up in the hands of the human resources department, when in fact the finance department is the unit that has the information on actual outlays.

8.35. A third type of survey consists in keeping a diary. Potential respondents receive a notebook or journal in which to write down whatever is being surveyed (purchases, events, and so on). The journals are then collected and tabulated. The advantages of this type of survey are that it requires somewhat less intervention by survey staff than telephone or in-person surveys and that respondents are encouraged to record events as they occur. The disadvantages are that underreporting can occur when respondents do not remember to log events, and that the method requires some level of literacy and experience with formal record-keeping.

8.36. A fourth type is a survey carried out in person. Trained surveyors travel to the respondents' locations to ask the survey questions and record the answers. This is the most powerful type of survey, as it bypasses the problems of illiteracy and to some extent allows surveyors to interview even persons without a permanent address, as well as permitting on-site adjustments to make sure that the right respondent is interviewed. Nevertheless, this is a costly way to conduct surveys, it can entail danger for the surveyors, and respondents are known to alter their responses in the presence of a surveyor, sometimes searching for responses which they believe the survey is eliciting. If this mode is used, survey-specific training and supervision is required for those staff conducting the interviews.

8.37. The newest form of survey uses the Internet or email to distribute questionnaires and collect responses. A body of literature summarizing difficulties, successes and lessons learned is rapidly emerging, and this mode of administration can be inexpensive and easy to use. Even where the diffusion of computers is widespread, however, this type of survey is more successful at reaching the younger, more literate, and higher income subgroups of the population.

8.38. Many surveys employ more than one method. For example, a mailed survey can be followed up by a telephone call to non-respondents. This can be followed, in turn, by a personal visit. Or a diary method can be combined with in-person interviewing. When done properly, this approach can combine the strengths of the various methods and mitigate some of their weaknesses. Advice from a survey statistician can be invaluable in designing the optimal survey approach.

8.39. As mentioned earlier, some forms of survey administration are impractical in low-income and middle-income countries. Health accountants lobbying for a new survey should be very careful to make sure that the proposed mode of administration is consistent with what is known about the survey environment: for example, to belabour the obvious, a telephone survey will not work when the bulk of the population does not have a telephone. In many countries with poorly developed infrastructures, an in-person survey is the only viable mode of administration.

Feasibility of cross-checks

8.40. No survey is perfect and without error. Sampling error exists in all sample surveys, and non-sampling error is inevitable and usually of more concern to the health accountant. The statistician's task is to quantify such errors, and the health accountant's task is to adjust for them. The primary method for making that adjustment is triangulation — comparing survey estimates with other independent sources of information of which the reliability is known. For example, household survey estimates of purchases of medicines at pharmacies often can be checked with industry estimates of such sales or with data from a central purchasing channel.

8.41. Surveys should be evaluated to determine which items could be verified in this manner. This verification does not have to be restricted to items related to health systems; with general-purpose surveys, verification of the survey's overall reliability can be made by checking other areas of expenditure (such as food or clothing). The more easily that a survey can be checked for reliability and bias can be quantified, the more useful it is.

Access to survey instruments and data sets

8.42. Evaluation of a survey's data for health accounting purposes usually requires consideration of the survey design and — possibly — examination of specific subsets of data for the purposes of data verification. Thus, it is important to have access to the design and instruments used as well as to the data sets themselves. The value of a survey for which the instrument and design are not available for examination is greatly reduced unless some evaluation of reliability can be made.

Regularity of survey

8.43. Other things being equal, a regularly repeated survey should always be preferred to a one-time survey. Recurrent surveys have had an opportunity to "work out the kinks", and results from one year can be compared with results from other years to assess their reliability. Unfortunately, regularly conducted surveys are usually implemented for other reasons than populating the health accounts, and may not offer sufficient detail for that purpose. This is why special surveys on health expenditure are often commissioned.

"Piggy-backing" on existing surveys

8.44. Although it is tempting to design and implement a freestanding survey to obtain data for the health accounts, that is often not the most cost-effective approach. Modifications of existing official surveys often can be negotiated to collect more detailed data on a permanent basis for use in the health accounts. For example, in the Hong Kong SAR of China, much of the information used to construct estimates of private spending relies on data collected by adding small modules to various rounds of the permanent labour force survey. Obviously, the closer the original purpose of the survey is to the kinds of information needed for health accounts, the better are the prospects for grafting health-related questions onto the survey.

8.45. A second reason for preferring amendment of an established survey for use in health accounting is that, besides the cost, a new survey brings with it unmeasured degrees of non-sampling errors. By contrast, the types of sample and non-sample errors associated with existing surveys have usually already been explored, so that the task of coping with these has already partly been accomplished.

Improving the quality of survey data

8.46. There are several ways to improve the quality of a survey for health accounting purposes. It might seem that increasing the sample size is the best way, but that is not necessarily true. The first way is to *reduce sample frame bias,* because no matter how good a survey is, if it cannot be generalized to the population as a whole its quality is severely compromised.

8.47. Once that bias has been confronted, the next step is to *reduce non-sampling error*. A tight confidence interval around the wrong estimate is of little help in preparing health accounts (or anything else). Reducing non-sampling error through survey redesign, or understanding the extent of bias through some type of survey evaluation, can cost less and be easier to implement than an increase in the number of surveys administered.

8.48. Only after sample frame bias and non-sampling error have been overcome should consideration be given to whether or not to *increase the sample size*. The number of sample cases is the largest factor in the cost of the survey and in the timeliness of its results, so this aspect of a survey needs careful consideration. Survey statisticians can compute the "power" of a survey — its ability to detect small changes or rare events in the population. Working with those statisticians, survey sponsors can establish the optimal sample size to achieve the desired power of the survey; increasing the number of cases beyond that point is not likely to be cost-effective.

8.49. Once a decision is made to increase the sample size of a survey, it should be borne in mind that some ways of doing so are more cost-effective than others. Particularly where the health system has been decentralized or where subnational estimates are desired, or where subgroups of the population are of policy interest, it is useful to *stratify the sample*, that is, to over-sample some groups. Stratification produces better estimates for the populations that have been over-sampled, usually with a small loss of accuracy at the national level compared with a purely random sample.

8.50. An inexpensive and powerful way to improve the quality of a survey is to *triangulate the results*. Triangulation refers to comparison of the survey data with data from other sources that use different approaches or methods to study the same subject. (The triangulation procedure does not necessarily require three data points; more than three can be used.) For example, household survey estimates of purchases of medicines at pharmacies can be checked against industry estimates of such sales. In the case of a difference among the various estimates, a review of the potential causes of the difference should be systematically performed, and the more credible source should be given more weight. The review might also suggest ways to improve each data source. Surveys should be evaluated to determine which items could be verified in this manner. Such verification does not have to be restricted to health-related items;

with general-purpose surveys, verification of a survey's overall reliability can be made by checking other areas of expenditure (such as clothing or food). The more easily a survey can be checked for reliability and that reliability can be quantified, the more useful it is — the greater is its quality.

8.51. Another way to improve the quality of a survey is to *repeat the survey regularly (8)*. A regularly repeated survey is of better quality for two principal reasons. First, cross-checks can be made with a larger number of other information sources and for more points in time, increasing the reliability of any point estimates derived from the survey data. Second, because much of a survey's bias and error is specific to the survey design, inter-temporal comparisons of expenditure based on different rounds of the same survey will tend to have greater reliability than inter-temporal comparisons of data from two independent surveys. This method of improvement, however, is probably the most expensive method. It requires an ongoing budget, the ability to retain trained interviewers over time, and the sustained interest of policy-makers to support the budget. Building the health accounts questions into a more general-purpose recurrent survey whose costs can be borne by several agencies improves the chances of these three events occurring.

Rapid assessment and other small-scale, low-cost survey techniques

8.52. Almost all processes to construct health accounts require the use of triangulation, iterative data analysis[14] and additional data collection to better understand, validate and complement expenditure data. Random surveys, to be well designed, require metadata,[15] skilled personnel and other resources that not always are available in a country. The same caveats apply as to any of the non-random techniques.

8.53. Non-stochastic (non-random) surveys are characterized by use of a non-representative but deterministic sampling — that is, a deliberate selection of respondents. In some cases, these may be people who can provide clues as to what is happening, where, and why. In other cases, the sample may consist of a handful of respondents whom the surveyor believes to be the major players, for example the main parastatal and private enterprises that are already known to be the major spenders on health. Rapid appraisal techniques can provide basic knowledge on the variability within a population, making it possible to select a more appropriate sampling frame. For example, if a comprehensive measure of total expenditure is wanted but information on expenditure by enterprises is lacking, an exploratory approach might consist of interviews with representatives of a few large enterprises. In health accounting, they help to explore an unknown market segment and fill information gaps about a selected population group (major stakeholders, key informants, HIV patients, etc.). The results of such a rapid appraisal would form the basis for deciding whether a comprehensive survey was justified, as well as contributing to a better estimate of total heath expenditure, pending the results of a larger sample survey.

8.54. Non-stochastic surveys have the following advantages: they can generate a fairly large amount of relevant information; they require only a low commitment of resources; they can provide in-depth understanding and information with regard to financing; and they are useful in identifying the need for further studies. Their reliability is dependent on the subject under study, the availability of time and resources to carry out the survey, and the nature of data required. They are very useful in conditions of data scarcity. Experience has proved their usefulness in estimating national accounts, notably in identifying changes in price, market composition, and market size. Their limitations nevertheless have to be borne in mind. In particular, the reliability and validity of the information obtained can be

[14] An iterative process replicates a cycle to produce results that approximate to the desired result. The shifting between data analysis and additional data collection is an iterative process.

[15] Metadata refers to data and other documentation that describes objects in a formalized way. Metadata is also referred to as meta-information. See United Nations Statistical Commission and Economic Commission for Europe, *Terminology on statistical metadata.* Conference of European Statiticians Statistical Standards and Studies No. 53, Geneva, United Nations, 2000.

questionable because of sampling or non-sampling bias, or logistic constraints. The results of non-stochastic surveys cannot be generalized to a national level.

8.55. Such non-random surveys may take different forms depending on selection. They include:

- key informant interviews;
- specifically selected household interviews (by district, by income, etc.);
- focus group discussions;
- community or group interviews;
- structured direct observation;
- exit interviews (for example, with clients after a visit to a clinic);
- record review and data extraction;
- meta-information analysis.

8.56. Rapid assessment or rapid appraisal is a low-cost and quick technique that can be used with one or a combination of the survey approaches listed above. It permits a sufficient understanding of a situation to make decisions regarding the design of additional research or to assess projects during implementation. Rapid appraisal techniques provide an order of magnitude. Their results can be integrated into a comprehensive approach to estimating health expenditure. They can be used to analyse the relevance of performing a nationally representative survey or to complement data obtained through another procedure. They can also help to establish reference values. In this case, the results constitute metadata that can be used to facilitate the adjustment of existing data for the triangulation or validation of available information.

8.57. In the case of small-scale surveys, the design focuses on reducing the sample size, collecting the underlying information needed to select the sample, reducing expenses for travel and for handling the questionnaire, and making the maximum use of the information available about the variable under study and its distribution in the population. For example, some researchers have had success using the Lot Quality Assurance Method (LQAS) to estimate expenditures for particular population subgroups (such as people with HIV/AIDS) *(9)*. Survey statisticians may be of help in designing such surveys.

8.58. In most countries, some aspects of expenditure data are considered to be sensitive, such as payments to health personnel made directly by the population. There is a lack of records on these payments. Focused surveys are thus required to obtain this information. A survey of key informants can indicate an order of magnitude of payments, along with details of how these payments are made. Such information can form the basis for a more comprehensive exploration of the matter.

8.59. As for any study, the following steps need to be taken in order to obtain good results: planning, preparation, data collection, analysis, and completion. This systematic approach requires, in particular:

- a clear statement of the areas to be studied, a full review of existing relevant data, and the identification of the most pertinent additional information needed for the planning of subsequent action by the responsible authorities;
- the selection of the most suitable method and definition of the sample size with prior field-testing of the instruments, instructions, indicators, and study design to be used.

8.60. In focus groups, a small number of people from the target population, under the guidance of a facilitator or moderator, discuss the selected topics in depth. A focus group usually has a flexible format, but discussion generally moves from general to specific issues. The discussion is tape-recorded so that a complete analysis can be made after the meeting. In contrast to individual interviews, which tend to be more structured, participants in a focus group should feel free to discuss sensitive issues. The interaction

within the group stimulates memories and feelings, leading the group to consider the topic in greater depth. Focus groups can be used to validate the content and wording of questionnaires, to discuss such sensitive matters as direct private payments to health personnel, and to validate or explain unexpected results.

Concluding thoughts on surveys

8.61. Information needs must be assessed in context in order to define the most effective way of collecting the missing elements. A basic tenet is that the cost of obtaining the data has to be commensurate with the relevance of the data obtained. For example, in a country where private medical insurance represents a very low share of health expenditure, it would not be advisable to develop a high-cost strategy to obtain data on such insurance unless a specific policy concern were related to it. At the same time, the lack of resources to carry out a random-sample survey should not deter health accountants from exploring an unknown dimension of national health expenditure using other methods. The lack of resources should not be an excuse for missing information in the health accounts, but neither should it be an excuse for a lack of credibility in the accounts.

8.62. A key message that appears throughout this *Guide* is that health accountants should not rely exclusively on their own expertise in generating data. Most central statistical offices, and ministries dealing with population or labour and employment matters have statistical experts among their staff. Organizations such as the United Nations agencies, multilateral and regional institutions, and development banks can usually provide relatively easy access to such specialists, although not without cost.

8.63. The improvement of surveys requires a continuous effort, as needs and the available technology evolve. Collective learning has proved to be important in this area of health accounting, as in other areas. In the Americas, the Inter-American Development Bank, the World Bank, the United Nations Economic Commission for Latin America and others are working to improve surveys, notably under the Programme for the Improvement of Surveys on Living Conditions in Latin America and the Caribbean (MECOVI) project,[16] with activities in countries and at regional level. Technical and geographic coverage have been improved, as has the analysis and use of data. The latter has included building up important linkages and communication between data producers and data consumers. Demographic and economic survey activities are developing in Africa, Asia and Eastern Europe as well, at the initiative of individual nations and prodded by multinational investment banks, regional development agencies and institutions associated with the United Nations family.[17]

[16] Detailed information available in http://www.eclac.org

[17] The Asia-Pacific National Accounts Network (http://www.apnhan.org) and similar institutions in the making in Africa and Eastern Europe are vehicles through which health accountants can quickly acquire a sense of regionally available resources. For the Americas, the Shared Alliance Network (http://www.lachealthaccounts.org) is a potentially useful site (as is http://www.eclac.org).

Chapter 9

Organizing the estimation process: developing a route map and establishing a list of financing agents

Organizing the estimation process: developing a route map and establishing a list of financing agents

9.01. The third stage in implementing national health accounts (NHA) is estimation of the elements of national health expenditure. Chapters 1 to 5 dealt with the concepts of health accounts, definitions to use when setting them up, and principles to use when filling them in. Chapters 6 to 8 dealt with collecting and evaluating data to be used in the accounts. It is during this third stage that the importance of the data attributes discussed in Chapter 6 will become apparent. Relevance and reliability, in particular, play a critical role in determining what numbers populate the health accounts tables. Frequent reference to previous chapters will be quite useful while working through the steps described in this and subsequent chapters.

9.02. Where should one start in estimating national health expenditure? There are so many aspects of the accounts, and so many dimensions, that it may seem bewildering. The natural temptation is to start off on what seems to be the easy road, but this may not be the best way. Through careful planning, the health accounts team will avoid becoming mired in seemingly contradictory data or producing accounts of dubious quality.

9.03. Experience in countries where NHA have been set up suggests that there are many paths to the completed product, but that some paths are more productive than others. This chapter begins a "task path" that has proven successful in many countries. In it, the NHA team of the fictitious country of Appia take their first steps along that path. Subsequent chapters are devoted to the remaining steps on the path.

Sequencing the estimation steps

9.04. Although the logical flow of health accounts follows the flow of money through the health care system, this is not necessarily the best way to sequence the estimation work. Money flows from financing sources to financing agents, then to providers who engage in functions. In fact, it is probably easiest to begin in the middle of the stream – with financing agents. From there it is possible to work back upstream to financing sources, and downstream to providers and functions.

9.05. This recommendation is driven by two basic considerations. First, financing agents represent a sort of bottleneck in the flow of health care spending. Compared to the number of providers or the number of beneficiaries of spending, there are relatively few financing agents, making the process of capturing (or at least representing) them relatively easy. At the same time, the flow of money through financing agents is often more easily separated into funds targeted at health care and those targeted elsewhere than is the case of money flowing from financing sources. It is easier to track agents' funds back to the source than to try to identify which flows from the source will end up in the health care system. The second consideration is that the data pertaining to these agents is often the soundest of any of the data available, and so this is the strongest dimension of any in the accounts.

9.06. Although the estimation path shown in Figure 9.1 (see page 129) indicates movement in one direction only, in practice health accounting involves considerable iteration. For example, the process of completing the table of financing agents and providers may lead to rethinking the estimates for those financing agents. The most important thing to remember in completing the accounts is that every piece of information provides a new opportunity to look at everything else that has been done; the beauty of the table approach used in the NHA is that, like double entry bookkeeping, there are at least two views of every entry in the accounts.

9.07. This path is one that has had success in many countries, but is not necessarily the best in all situations. The data sources available may not be robust enough to support this approach. In such cases, it may be possible only to estimate the margins of the NHA tables, using budget or expenditure classes (the resource cost dimension described in Chapter 4) as a guide. In some cases, the country's financing may be so complex or fragmented that the approach simply puts the NHA team on one of the harder

paths. If this is the case, other paths should be explored; for example, it may make sense to estimate expenditures by provider type first. This *Guide* is a map drawn by others who have already started on their journey, but ultimately each country must follow its own road. The most important point to be made here is that although a country's health accounts team should try to follow standard practices, its approach should be one that fits the individual situation.

9.08. The chapters in this latter part of the *Guide* describe a process for estimating different aspects of the health accounts. This chapter deals with the work planning prior to actual estimation and with developing a rough sketch of the health system and organizing a tentative list of financing agents.

Organizing the health accounts effort

9.09. This section of the *Guide* starts with the premise that an individual has been given the task of producing health accounts for the country. The first steps on that path should be to create a team, build a steering committee, and develop a workplan.

Securing team mates

9.10. As discussed in Chapter 2, health accounting is done more easily and effectively when there is a diversity of backgrounds and skill sets involved. Wherever possible, the analyst assigned to the health accounts task should negotiate with his or her management to build a team. Team members may be involved in the project on a part-time basis, or perhaps engaged on a consultant basis, but having more than one person engaged is definitely preferable to a solo effort. Of course the budget available to the project will be a key element in any discussion of staffing, and it may well be that the initial phases of the project must be accomplished by one person.

Building a steering committee

9.11. A good steering committee is as important as, if not more important than, a well-staffed team. The roles of the committee are many: They advocate for budget, they advise on their structure of the health system and on the policy issues to be addressed using the health accounts, they open doors to sources of information, and they communicate and advocate for NHA outputs.

9.12. It is therefore critical to choose steering committee members wisely. Each of the major stakeholders in the health financing system should be represented - providers, financers, and financing sources. Each of the key statistical entities should be represented, too - those that collect data, those that tabulate data, and those that interpret data. Steering committee members should be high enough in their organization's hierarchy to wield influence, but not so high that they have no time to devote to the project. Members should also be relatively conversant with the "numbers" side of health policy, so that they can actively participate in supporting the health accounts project.

Developing a work plan

9.13. It is important to establish a shared set of expectations very early in the project. The NHA team should sit with its management and clearly lay out what is expected, when it is expected, and in what format. These expectations should be shared with and validated by the steering committee.

9.14. Part of the process of establishing reasonable expectations for the project is the development of a timetable. Rough times should be laid out for each phase of the project and milestones or waypoints identified to track progress. Of course, such a timetable can never be considered accurate down to the day; but it can help the team and its management to see whether the project is approximately on schedule to deliver the products expected in the time expected, and to adjust the expectations of customers if necessary.

Mapping out the health care system

9.15. Again, as discussed in Chapter 2, having a sketch of the health care system in hand before beginning to construct the health accounts tables is of critical importance. In some cases a sketch — or a partial sketch — may already exist; in others it may need to be updated, expanded, or created from scratch.

9.16. For each of the actors identified in this sketch, some basic information is useful. For example, it is useful to compile information about each of the major stakeholders concerning:

- its infrastructure, geographical distribution, and human resources;
- expenditure reports produced about its activity;
- health services it produces;
- its main programmes or interventions;
- the population covered;
- external funding it receives;
- health reform processes it is experiencing.

9.17. Other data concerning major stakeholders may be equally useful but more difficult to find immediately:

- payments by users;
- external funding;
- transfers;
- private expenditure records;
- private tax records;
- private health services provided;
- pharmaceutical expenditures incurred;
- investments.

9.18. It is also helpful to secure details about the benefit structure of each major insurance scheme. This can help to estimate or validate estimates of household payments for health care.

9.19. The task of developing this information requires a balance between speed and thoroughness. On one hand, it is important not to become bogged down in the minutiae of the health system, so much so that the accounts never get started. Nor is it important to wait to begin the table construction until every piece of information is in place for every actor. On the other hand, without a fairly detailed understanding of how the system works it is difficult to be sure that all the actors and transactions are being reflected in the health accounts outputs. In addition, the research done at this stage may make subsequent steps a bit easier to accomplish. It is worth while using the steering committee or an ad hoc focus group comprising policy analysts, academic researchers, and similar parties to review or develop the preliminary model of the system.

Creating a data plan

9.20. Looking over the sketch that has been developed for the health system, the health accounts team should work with its management and the steering committee to develop a plan for acquiring data (see paragraphs 6.06 to 6.14). In countries where there has already been some analysis of the health care financing system, country profiles and reports on different segments of the system may indicate data sources. In other countries, the health accounts team may need to interview key informants at stakeholder institutions to identify their organization, data collection, and data dissemination. Especially for private stakeholders, it is important to seek out umbrella organizations, such as nongovernmental organizations and industrial associations, to make it easier to find reports, data, relevant information and key informants (see Box 9.1).

9.21. Especially at the start of the process, contact with international organizations may be of help. Certainly national data may be more complete and current; but in many countries this information may be complemented through international information sources that can lead to data, explanations of that data content, and indications of who is handling the data in each country. Using International Monetary Fund (IMF), World Bank, and regional development bank data files and policy analyses, as well as myriad national sources, the World Health Organization (WHO) has developed an information base, which could be the point of departure for NHA teams just beginning their work. This is available at http://www.who.int/nha

Box 9.1
Initial contacts for information

At the national level

- Executed budget and institutional reports of the ministry of health, social security institutions, and other institutional segments of the health system
- Expenditure reports, etc.

At the international level

- Caribbean Community (CARICOM)
- International financing institutes and African, Asian, and Caribbean Development Banks
- World Bank: sector reports
- European Commission and Council of Europe: social security and social integration report (MISSOC)
- Eurostat: statistics and reports on social protection, employment, national accounts and other cross-classification areas
- International Labour Organization (ILO): household surveys, social security statistics
- International Monetary Fund (IMF): government finance statistics, international financial statistics
- MERCOSUR: economic comparisons and trade statistics (pharmaceuticals, services)
- Organisation for Economic Co-operation and Development (OECD): health data, country economic surveys, health at a glance, national accounts
- Pan American Health Organization/World Health Organization (PAHO/WHO): health conditions of the Americas.
- United Nations: national accounts
- World Health Organization (WHO): health systems country profiles, *The world health report annex of national health accounts*, health system in transition monographs.

Sketching in potential financing agents

9.22. A good first step in the process of sketching in potential financing agents is to list all the various central government organizations that spend money on health. It is not important to try to match money amounts with these sources just yet, nor even to work out whose money they are spending – the goal is to get a complete listing of financing agents. The framework for this list was laid out in Chapter 4.

9.23. Of course, the ministry of health comes to mind immediately, but there are most likely other central government ministries that have some role, too. Most governments do not restrict health service expenditures to their health ministry; programmes are frequently found in other departments for both practical and historical reasons. For example, the ministry of education may spend money for health research and for medical education. The ministry of defence often maintains its own system of health care facilities, and if so it should be included in the list. Systematic reviews usually reveal many areas of expenditure not normally regarded as health-related, such as expenditures for prison health services. For that reason, it may be easiest to take a central government organization chart and run down the list of ministries, committees, and agencies to make sure that every possible financing agent is included on the list. This review process is easier if officials responsible for particular programmes are consulted during the exercise.

9.24. As these potential financing agents are enumerated, each should be assigned a code, following the ICHA-HF classification schedule in Chapter 4. For example, the ministry of health could be assigned HF.1.1.1.1, the ministry of education HF.1.1.1.2, and so on. There is no specific coding scheme to follow below the HF.1.1.1 level, so a schedule should be chosen that makes sense to the country's policy-makers.

9.25. Subnational government units must be included if they spend money on health care. This includes both regional and municipal governments, and it is most often useful to list them separately. As with central government units, each of these units can be assigned its own code within the HF.1.1.2 group. The choice of how detailed to be depends upon data availability and policy needs: if the data do not distinguish among various entities of the same type, there is no benefit in keeping them separate. On the other hand, if the data do distinguish among them there is a potential benefit in terms of time-series stability and presentation possibilities. Whatever the level of aggregation, however, at this stage of the process it is not important where the money comes from; what is important is a list of the entities that spend money on health or health care.

9.26. Social security schemes (HF.1.2) should be included if they pay for health care (see paragraphs 9.41 to 9.43). If more than one scheme exists, the costs and benefits of keeping each of them distinct within the HF schedule should be considered.

9.27. Parastatal firms, such as government-owned mining, petroleum, or power companies, should be listed if they engage in health activity through company clinics or insurance schemes. These should be assigned codes in the HF.2.5.1 group.[18] Other extrabudgetary entities should be assigned codes in the HF.1.1 group, or in the HF.2.5.1 group, depending upon their nature - general government or parastatal organization.

9.28. Once the list of potential government financers of health care spending is completed, nongovernment spenders should be considered. Is there a private insurance industry? If so, it should be listed here. If both a private social insurance industry (HF.2.1) and a private (voluntary) medical insurance industry (HF.2.2) exist, they should be listed separately.

9.29. Households are a purchaser of care in any health care system, and must be listed (HF.2.3).

9.30. There should be an entry (or more than one) for nonprofit organizations in the list. These organizations may operate health care facilities, or engage in public health activity, or finance health research. They should be assigned codes in the HF.2.4 group.

[18] In the remainder of this *Guide*, it is assumed that the health accounts include parastatal firms and government employees' health insurance as categories separate from their private sector counterparts. This should not be seen as an endorsement of the practice, but merely as an aid to understanding how to construct and populate the tables in the accounts. The reader can make the appropriate consolidations if his or her health accounts will not use these separations.

9.31. Private firms (HF.2.5.2) should be listed, because these entities often pay for or provide health care on behalf of their employees.

9.32. If external organizations are active in the country, they should be included in the list and assigned codes in the HF.3 group.

9.33. When organizing the list of financing agents, it is critical to remember two things. First, it is important to bear in mind the definition of health spending developed in Chapter 3. Second, it is important to remember a point made in Chapter 6: there may be more than one place in each entity where data reside. It is vital to the success of the project to think carefully about who needs to be contacted in each organization, and to probe with each of those contacts as to whether there are others who have been overlooked.

9.34. When the list is complete, it will look something like Table 9.1. This hypothetical list shows all the potential financing agents, and next to each is its code. For the purposes of estimation, each ministry has been assigned its own code. This is to help keep track of funds later, and to help when the accounts are estimated for subsequent years. When the time comes to publish the accounts, it will probably be convenient to "roll up" or consolidate these codes. As mentioned above, the reason for keeping a greater level of detail for estimation than for publication is the utility gained in estimation and in ease of replication in future NHA cycles.

Table 9.1 List of potential financing agents and their ICHA codes

Code	Description
HF.1	Total government
HF.1.1	General government
HF.1.1.1	Central government
HF.1.1.1.1	Ministry of Health
HF.1.1.1.2	Ministry of Education
HF.1.1.1.3	Ministry of Defence
HF.1.1.1.4	Other
HF.1.1.2	State/provincial government
HF.1.1.2.1	State health department
HF.1.1.2.2	Other
HF.1.1.3	Local/municipal government
HF.1.1.3.1	Health and recreation council
HF.1.1.3.2	Public health council
HF.1.2	Social security funds
HF.2	Total private
HF.2.1	Private social insurance
HF.2.1.1	Government employee health insurance*
HF.2.1.2	Other private group insurance*
HF.2.2	Private insurance enterprises (other than social insurance)
HF.2.3	Private households' out-of-pocket payment
HF.2.4	Non-profit institutions (other than social insurance)
HF.2.5	Private firms and employers
HF.2.5.1	Parastatal firms*
HF.2.5.2	Other private firms and corporations*
HF.3	Rest of the world

* Recommended coding if these distinctions are important

9.35. The list obtained in this first round is only tentative. It may be amended during the next steps when listing providers, expenditure functions, financing sources - and even when identifying the beneficiary groups. At each of these steps, an overlooked financing agent may be revealed. The list may also be amended in subsequent NHA cycles, when time may permit a deeper probe into the "tangled thicket" of health care financing. Whenever important reforms are implemented, the list of financing agents will need to be reviewed to capture any new ones that have emerged or to eliminate those that have ceased to exist.

Classifying financing agents

9.36. The classification of financing agents is not always obvious. The material in Chapter 4 and Annex B can help in this regard, but there are several specific points that benefit from further explanation.

Government-owned "businesses"

9.37. The rules for deciding whether to count an entity as part of general government or as a parastatal firm are laid out in paragraphs 4.106 and following of the *System of national accounts 1993 (4)*. A government establishment should be classified as a parastatal firm if it (a) charges prices for its outputs that are economically significant; (b) is operated and managed in a way similar to a corporation; and (c) has a complete set of accounts that enable its surpluses, savings, assets and liabilities to be separately identified and measured. This means that it would be included under HF.2.5. If the "business" does not meet the three criteria just mentioned, it should be included with general government, either by inclusion with the sponsoring ministry or as a separate component in HF.1.1. If a decision has been made to combine parastatal entities with general government to form a public sector, then sub-categories in HF.2.5 are needed — this *Guide* uses HF.2.5.1 for parastatal firms and HF.2.5.2 for private firms (again, subcategories can be used for each of the principal parastatal firms).

9.38. The same rules apply to parastatal providers and any other provider when establishing financing agents. The financing agents are the entities whose payments constitute the provider's revenue. If the parastatal provider operates under a deficit that is subsidized by a ministry, then the ministry — not the provider — is counted as a financing agent for the amount of the subsidy.

Private physicians practising in government facilities

9.39. Government spending for operation of the facilities will still appear under HF.1.1 (or HF.1.2 if the facility is owned by the social security system). If the private practitioners reimburse or pay the ministry for use of the facilities, then those payments should be subtracted from total government spending. For example, if the ministry of health spends 410 million national currency units to operate a polyclinic, and receives 45 million from private physicians for use of the facility, then the net ministry of health payment for that polyclinic in the health accounts is 365 million. This reduction must take place to avoid double counting.

9.40. However, if private physicians simply use government facilities, or if public employees practise privately on government premises without payment to the government, the government is not a financing agent for those services. Expenditures financing such services should be shown under another financing agent, for example, household out-of-pocket expenditures.

Social security versus private social insurance

9.41. In distinguishing between public social health insurance (social security funds, HF.1.2) and private social health insurance (HF.2.1), two factors are important: the intent of the programme and the control of the programme. The SNA93 distinguishes between three main types of social insurance. The first type is social security schemes, which cover the entire community (or at least a very large part of it), and which are imposed, controlled, and financed by government units. Thus, if the beneficiaries of a scheme are eligible for a reason other than employment at a government entity, then the programme would be classified as HF.1.2, depending on a further test. That further test is whether the government exerts control over payment rates, participating providers, and so on. If it does — even if it does so through some agent — then the scheme is classified as belonging to HF.1.2. If the government does not control the scheme — if it merely requires that the scheme be in place, perhaps with some broad guidelines — and if some other entity exercises the principal control over the operation of the programme, then the scheme should be classified as HF.2.1.

9.42. The second type of social insurance scheme identified in the SNA93 consists of privately funded schemes. These are characterized by contributions paid to insurance enterprises or autonomous funds, or by maintenance of reserves by the employer that are segregated from the employer's other reserves. Governments do not require such schemes, but employers may require that the employees participate. These schemes would be classified as HF.2.1(see also paragraph 4.06).

9.43. The third type of social insurance scheme consists of unfunded programmes. Here, employers pay social benefits to their employees, former employees, or dependants out of the employers' own resources without creating special reserves for the purpose. In theory, this type of scheme also should be classified with HF.2.1, but it is highly unlikely that the existence of such schemes can be identified, much less separated from other types of employer spending for health. So it is much more likely that in this case employer payments will end up classified in HF.2.5 and employee payments (net of reimbursements) classified in HF.2.3.

Social health insurance versus other health insurance

9.44. Whether controlled by government or privately, social health insurance is one where the policy holder is obliged or encouraged to insure by the intervention of a third party. An insurance programme is designated as a social insurance programme if at least one of the following conditions is met: (a) participation is compulsory by law or by condition of employment; (b) the programme is operated on behalf of a group and is restricted to group members; or (c) an employer makes a contribution to the programme on behalf of an employee. These programmes are counted in HF.2.1. In contrast, voluntary medical insurance — which individuals join by their own wish and pay from their own resources — are counted in HF.2.2 (again, see paragraph 4.06). In practice, it may be difficult or impossible to separate the two types of programmes, especially if insurance companies operate both types of schemes at the same time. If the issue of voluntary medical insurance is important, it is worth the effort to disentangle the financing at the insurer level; if it is not an issue, the practical consequences of the confusion may be minimal (at least at the national level). In either event, HF.2 is unaffected.

Government health insurance plans that cover only government employees

9.45. Following the discussion of paragraph 9.44 above, government health insurance plans that cover only government employees should be in HF.2.1. They are not social security schemes (HF.1.2) because they are for government employees and dependants only, as opposed to the population at large (see also paragraph 8.63 of SNA93). It is virtually certain that both funded and unfunded payments from the

government can be identified and safely classified as HF.2.1. However, in the case of unfunded schemes, household co-payments are likely to be reported as out-of-pocket spending rather than as co-payment; although the one-digit report for households (HF.2.3) is not affected, minor problems could arise in reporting at the two-digit level (HF.2.3.1 versus HF.2.3.6).

9.46. If a decision has been made to include these insurance programmes with general government to form a public sector, subcategories of HF.2.1 will be needed. This *Guide* uses HF.2.1.1 for government insurance and HF.2.1.2 for private sector social insurance.

Including ministries with closed health systems

9.47. The goal of the health accounts is to measure all spending for health in the nation. For this reason, all health systems that provide care to citizens of the nation must be included. This holds true for any government entity, including those that operate facilities open only to their employees. For example, in many countries the ministry of defence operates hospitals and clinics that serve only members of the military (and often their families). Although these facilities fall outside the jurisdiction of the health authorities, they still comprise a part of the system delivering care to the country's citizens.

Nongovernmental organizations versus extrabudgetary entities

9.48. The key to the distinction between nongovernmental organizations and extrabudgetary entities is in their names. If the activity of an organization is substantively controlled by a government entity, it should be classified as an extrabudgetary entity (HF.1.1 or HF.2.5.1); otherwise, it is a nongovernmental organization (HF.2.4).

Starting on the health accounts path in Appia

9.49. Although real-world examples can be very instructive, they also pose a problem when used to illustrate a guide such as this. In reality there are myriad ways in which any given country's experience deviates from the ideal. These deviations themselves are interesting but can also confuse the reader who is trying to acquire the basic flow of the NHA process.

9.50. To avoid those distractions, the *Guide* will use the experience of a mythical country, Appia, to illustrate the mechanics of health accounting. The Appian example has been constructed to reflect the major financing and delivery arrangements discussed in the *Guide*, and the narrative of the Appian NHA team's work reflects some of the iterative nature of the health accountant's task.

9.51. The Appian example is constructed to show an implementation that includes development of survey material. Therefore, the project timeline is long. Countries that do not need to develop new surveys, and those that do not have the budget to do so, will find the timeline considerably shorter.

9.52. If Appia seems more data-rich than many countries, it is because the *Guide* focuses more on how to use data than on how to collect data. There are many reference materials, handbooks, and textbooks on sampling, surveying, and the like, and these treat the subjects more completely and in greater detail than is possible here.

9.53. The Appian way of health accounting is not the only path. In many ways, the Appian approach to health accounting reflects best practices from the experiences of many countries. As has been stressed

repeatedly throughout this *Guide*, however, each country's situation presents a unique set of opportunities and challenges, and the NHA process will need to be tailored to that set of opportunities and challenges.

Origin of the Appia health accounts project

9.54. Appia is a relatively small middle-income country undergoing significant reforms of what was once a rather autocratic central government. Because of recent shifts in the political structure, political power has devolved to regional governments, as has responsibility for some social programmes.

9.55. The office of the Prime Minister has recently developed a keen interest in measuring the activity in Appia's health system. Some of the interest comes from a desire to provide reports to international lenders on the efficiency of their loans; some of the interest comes from a desire to respond affirmatively to an invitation from the World Health Organization to provide health expenditure statistics. A considerable part of the interest comes from a desire to understand how Appia's political and economic reforms have affected financing and delivery of services, especially as traditional reliance on Ministry of Health records alone is no longer sufficient in the wake of devolution. Finally, the Prime Minister is interested to see how the national health insurance programme fits into the overall health system.

9.56. After discussion with the Ministers of Finance and of Health, the Prime Minister directs the Ministry of Health to produce a set of health accounts. This task is assigned to the Deputy Minister of Health, who details three technical experts from the ministry to form the NHA team.

9.57. The health accounts team meets with the Deputy Minister of Health and convinces the Deputy Minister that it is important to include the Ministry of Finance, the Appia Statistical Agency and the Appian National Insurance Agency in the project at a senior level. The Minister of Health and Deputy Minister secure agreement from these organizations, and a Steering Committee is formed comprised of the Deputy Minister of Health and the Deputy Minister of Finance, plus the Deputy Director of the Appia Statistical Agency and the Deputy Director of the National Insurance Agency.

First steps

9.58. The Steering Committee meets under the chairmanship of the Deputy Minister of Health. They review the rules of their operation:

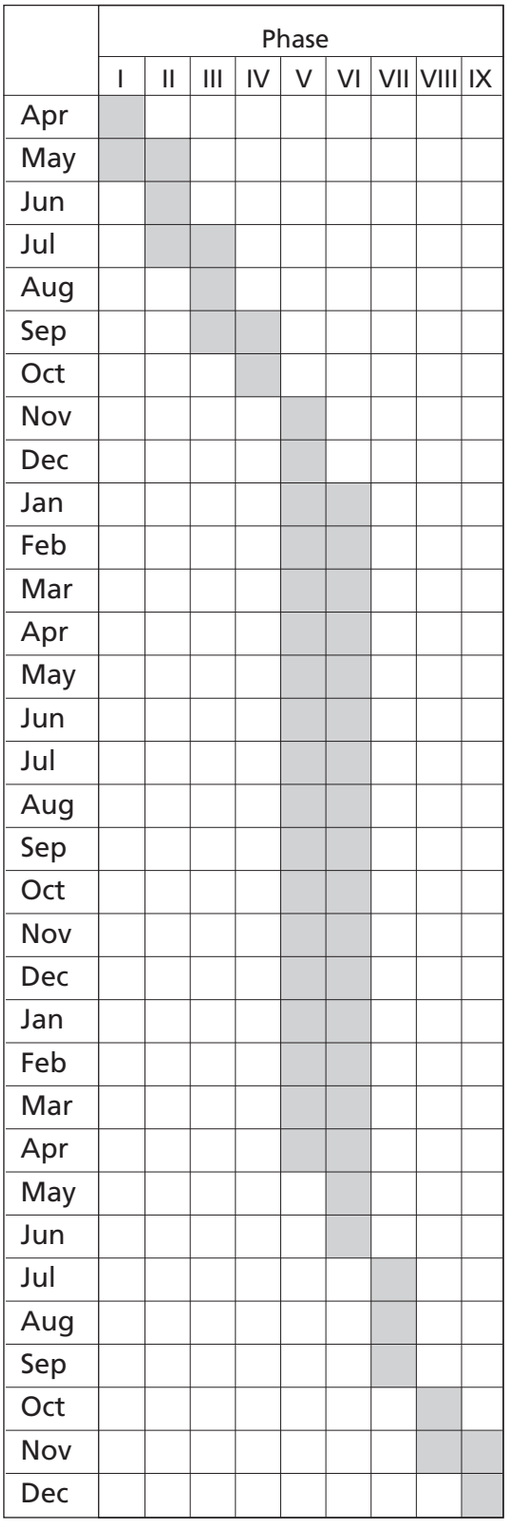
- to make sure that the NHA team remained focused on its work;
- to make data available to the team by "opening doors" in their respective organizations;
- to make ad hoc consultative services available from their respective ministries;
- to lend a policy perspective to help the team make the NHA useful for decision-makers.

9.59. The Steering Committee then meets with the NHA team. At that meeting, the Steering Committee members reaffirm their commitment to the project and their role in the project. After some discussion of the general nature of the exercise, they request an initial project plan from the team.

9.60. The team delivers this plan. After some discussion and revision, all parties agree to the plan. They also agree that, because this is the first attempt at a formal NHA exercise, the plan might need mid-course corrections. The team agrees to keep the Steering Committee apprised of progress at regularly scheduled meetings.

9.61. The plan submitted by the NHA team (see Figure 9.2) consists of nine project phases spread over 33 months (including the pre-work Phase I).

Figure 9.2 Project plan for Appia: workplan for producing national health accounts



9.62. Phase I is spent in establishing the NHA team. This includes work with the Steering Committee, finding space and equipment, developing the project plan, and so on.

9.63. Phase II involves determination of the overall conceptual framework for the Appia NHA.

9.64. Phase III is devoted to developing the national framework for the NHA, with draft operational descriptions of classification system categories (for example, functions and providers). This is done in consultation with users, stakeholders and data suppliers. This phase also involves a tentative identification of organizational structures for maintaining NHA after the first round, as well as efforts to secure the commitment of key stakeholders.

9.65. Phase IV is development of an overall data collection strategy – assigning operational responsibility for data collection, analysis, and so on. It requires that the framework for the accounts be at least roughly set.

9.66. In Phase V, data will be collected and coded. The NHA team schedules a long stretch of time for this phase, in case original data collection is needed. The team members assume that there will be about 12 months of fieldwork involved, plus another 6 months of design and tabulation work. They also build in time for examining existing government coding systems.

9.67. Phase VI involves compilation of draft NHA tables and time series.

9.68. In Phase VII, NHA results will be reviewed by key stakeholders, including the government agencies whose approval is required for release of statistics as national statistics. Any revisions or follow-up data collection will occur in this phase.

9.69. Phase VIII is spent in preparation and dissemination of final NHA results.

9.70. Phase IX will involve identification and implementation of future NHA mechanisms.

9.71. The NHA team and the Steering Committee agree that Phases V and VII are the most variable and will require frequent discussion of progress and problems.

9.72. Work begins almost immediately on the project. The team leader and the Deputy Minister of Health meet with logistics personnel at the ministry, who are instructed to assist the team in finding office space and equipment. In the meantime, the team organizes a working session with key informants from the ministries (including some Steering Committee members), from industry, and from the provider community to prepare a sketch of the Appian health care system and to prioritize issues to be addressed with the health accounts. This sketch and list are shared with the Steering Committee. After a number of iterations, including meetings with key parliamentary figures to secure their support and input, a working picture of the health system and of the health accounts framework is developed.

9.73. In Phase III, meetings are held with the major stakeholders in the health care system and the government statistical system. The purpose of these meetings is to develop the classification schedules for the various dimensions of the health accounts. The objective is to make sure that the ICHA categories meet the policy needs of decision-makers, that they are consistent with other classification schemes in use in the country, and that they sufficiently partition the various actors into analytically useful groups. Ties with the various ministries, committees, and associations are created at the staff level during this phase of the project.

Sketching the Appian health system

9.74. A few highlights of Appia's health care financing and delivery may help to explain the sketch developed by the health accounts team and shown in Table 9.2 (see pages 125 and 126).

9.75. The Appian central government ministries of particular importance to health spending are those of Finance, Health, Education and Defence. In addition to these ministries, the National Insurance Agency is responsible for administering the national health insurance system. Also, Appia has a nationally owned electricity utility, AZap, which operates as a parastatal organization, receiving support and occasional subsidies from the central government through the Ministry of Industry, and which is known to be active in the health care of its employees.

9.76. Local governments have been established in each of the four regions, which are quite dissimilar in terms of industrial composition, population density, and income per capita. Each region has its own taxing authority, and regional tax revenue is supplemented by central government funds derived from a national income tax.

9.77. Appia's health system is rather pluralistic. Most hospitals and polyclinics are government-owned, dating back to pre-reform days. Ownership of the polyclinics and primary care hospitals has been transferred to regional governments, but the Ministry of Health continues to own and operate the secondary and tertiary hospitals. The Ministry of Defence owns its own hospital and polyclinics, which are open only to military personnel and their dependants. In recent years, private hospitals and polyclinics have emerged in the wake of political and economic reforms, as the central government privatized the delivery of some health care.

9.78. In addition to the ambulatory services offered at Appia's polyclinics, inhabitants can receive services in other settings. There are a growing number of physicians in private practice and, especially in the Interior Region, heavy reliance on traditional healers. A substantial part of outpatient prescription drugs are purchased from private community pharmacies. A few employers also maintain on-site clinics for workers – a legacy of the earlier political structure of the economy.

9.79. Everybody except government employees and military in Appia are covered by national health insurance, run by the National Insurance Agency. This insurance is financed by payroll taxes, and by payments from the Ministry of Health to cover people who are not in the workforce. Beneficiaries must also pay a

co-insurance amount to the provider at the time of service. Many employers offer supplementary insurance that pays for services in Appia's non-government facilities (not covered by national insurance). Individuals not eligible for that coverage can purchase policies on their own.

9.80. In addition to some small national non-profit organizations, there is involvement by foreign organizations in Appia's health insurance and delivery system. The group Doctors without Borders and the International Red Crescent are active in the country, as is Project Hope.

Creating a data plan for the Appia national health accounts

9.81. Phase IV work is also a collaborative exercise. The NHA team meets with individual Steering Committee members, and also with the entire group. They also use the meetings described under Phase III to discuss data sources with stakeholders. The team develops the data plan shown in Table 9.3 (see pages 127 and 128), recognizing that this plan will need to be expanded and revised as the project evolves.

9.82. During the course of preparing their inventory of data sources, it becomes clear to the team members that they must sponsor some surveys of their own in order to obtain information on activities of private insurers, employers, external financing organizations, and nongovernmental organizations. Consulting with colleagues in the Ministry of Finance (where the national income and product accounts are estimated) and with colleagues from the Appia Statistical Agency, the team develops questionnaires for each survey, which are designed to collect information in categories that can be used for health accounts as well as for other statistical purposes, including characteristics that can be used to "inflate" survey results to national totals. For example, the employer survey asks for type of business and for the total number of employees; Ministry of Finance staff provide a sampling frame using these characteristics. These survey forms are reproduced as exhibits appended to this chapter along with other data gathered by the team (see Exhibits 9.1–9.5, pages 130–137).

Filling in the tables

9.83. With this organizational background, the NHA team begins work on its project. It arranges the apparent financing agents from its sketch along the lines of the ICHA-HF classification schedule, producing (Exhibit 9.6, see page 137). Its next steps are discussed in the chapters that follow.

Table 9.2 A schematic description of the Appian health system

Actor	Population covered	Benefits or activities	Sources of funding	Provider-payer relationships
Insurers				
National Insurance Agency	Everybody in Appia is covered by national health insurance except civil servants and military personnel and their dependants	Medically necessary goods and services from licensed providers	Payroll taxes for workers and dependants; payments from the Ministry of Health for people not in the workforce	Contract fee for service; providers collect and retain co-insurance amounts due from beneficiaries at the time of service
Government Employees' Health Insurance Programme	Government civil servants	Medically necessary goods and services from licensed providers	Budget	Contract fee for service; providers collect and retain co-insurance amounts due from beneficiaries at the time of service
Private group insurance	Subscribers and dependants (only available through contracting employers)	Medically necessary goods and services from licensed providers as stipulated in terms of contract	Premiums from employers and subscribers	
Voluntary medical insurance	Subscribers and dependants	Medically necessary goods and services from licensed providers as stipulated in terms of contract	Premiums from subscribers	
Providers				
Hospitals				
Ministry of Health hospitals	Inpatients referred by primary hospitals	Secondary and tertiary inpatient care	National Insurance Agency payments; subsidy from Ministry of Health budget	Contracted fee for service
Ministry of Defence hospitals	Military and dependants only	Primary care	Ministry of Defence budget	Owned and operated by Ministry of Defence
Regional government hospitals	Non-military	Primary care inpatient services	Insurance payments and patient payments; government subsidy	Contracted fee for service
Private hospitals	Any inpatient	Primary care inpatient services	Insurance payments and patient payments	Contracted fee for service

Table 9.2 A schematic description of the Appian health system (continued)

Actor	Population covered	Benefits or activities	Sources of funding	Provider-payer relationships
Providers				
Polyclinics				
Regional government polyclinics	Nonmilitary	Ambulatory care, including prescription drugs and supplies	Insurance payments and patient payments; government subsidy	Contracted fee for service
Private polyclinics	Any outpatient	Ambulatory care, including prescription drugs and supplies	Insurance payments and patient payments	Contracted fee for service
Private physicians	Any outpatient	Ambulatory care, excluding prescription drugs and supplies	Insurance payments and patient payments	Contracted fee for service
Private pharmacies	Any outpatient	Prescription drugs	Insurance payments and patient payments	Contracted fee for service
Traditional healers	Any		Patient payments	Contracted fee for service
Other actors				
Ministry of Education	None	Research; training of providers	Ministry of Finance	Owned and operated
Nongovernmental organizations	None specific	Unknown at this time		
External resources	None specific	Unknown at this time		
Employers				
Workplace-based care	Employees of participating employers	Ambulatory care, including prescription drugs and supplies	Internal reserves	Owned and operated
Reimbursement for care	Subscribers and dependants or participating employers	Agreed-on goods and services	Internal reserves	Employers reimburse employees for agreed-on medical expenses incurred by employees

Table 9.3 Appia national health accounts project: tentative data plan

Actor	Data needed	Possible sources	Team member	Steering Committee member (if needed)
Central Government				
MoH	Budget documents	MoH; MoF		MoH
MoD	Budget documents	MoD; MoF		MoF
MoE	Budget documents	MoE; MoF		MoF
Regional	Budget documents	MoF		MoF
Insurers				
NIA	Statement of operations	NIA		NIA
Government Employees' Health Insurance Programme	Statement of operations	MoF		MoF
Private group insurance	Premiums, by source; benefits, by type	ASA? Survey?		ASA
Voluntary medical insurance	Premiums, by source; benefits, by type	ASA? Survey?		ASA
Providers				
Hospitals				
MoH hospitals	Statement of operations	MoH; hospitals?		MoH
MoD hospitals	Statement of operations	MoD; MoF		MoF
Regional government hospitals	Statement of operations	Hospitals? MoF reports?		MoF
Private hospitals	Revenues, by source	GDP work? Survey? Trade association?		ASA
Polyclinics				
Regional government polyclinics	Statement of operations	Policlinics? MoF reports?		MoF
Private policlinics	Revenues, by source	GDP work? Survey? Trade association?		ASA
Private physicians	Revenues, by source	GDP work? Survey? Trade association?		ASA
Private pharmacies	Revenues, by source	GDP work? Survey? Trade association?		ASA
Traditional healers	Revenues, by source	Survey?		MoH
Other actors				
Nongovernmental organizations	Statement of operations; project lists			ASA
External resources	Statement of operations; project lists			MoF; ASA
Employers				ASA
Workplace-based care	Spending for on-site clinics			

Table 9.3 Appia national health accounts project: tentative data plan (Continued)

Actor	Data needed	Possible sources	Team member	Steering Committee member (if needed)
Other actors				
Reimbursement for care	Services reimbursed			
Premiums paid for insurance	Premium amounts			
Households				ASA
Out of pocket spending		NIA? insurers? survey?		
Insurance premiums		NIA; insurers? survey?		
Social, economic, demographic characteristics		Survey		
Health functioning		Survey		
MoH = Ministry of Health.				
MoD = Ministry of Defence.				
MoE = Ministry of Education.				
MoF = Ministry of Finance.				
NIA = National Insurance Agency.				
ASA = Appia Statistical Agency.				
GDP = gross domestic product.				

Figure 9.1 Route map for estimating national health accounts

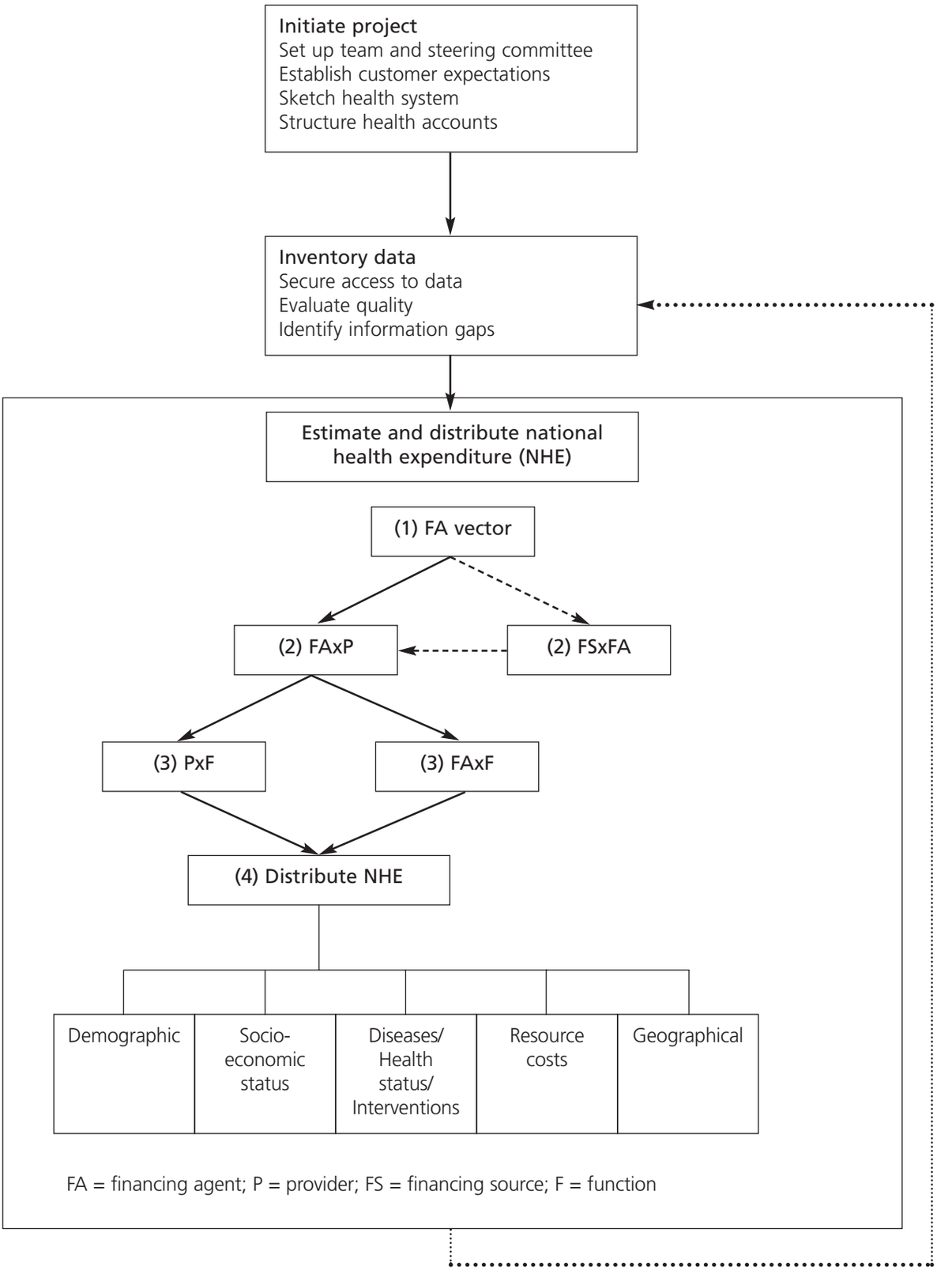


Exhibit 9.1 Appia: national health accounts 2002. Health insurance questionnaire

Form ID No.___/___

The information provided will be treated with strict confidentiality.

1. General information

Name of company: WEIGHTED TABULATION OF FORMS RECEIVED
Name of respondent:
Position of respondent:
Date of interview:
Location:
Reporting period–Calendar year 2002 or:

Type of insurance company (circle one)
1 = State-owned/parastatal
(2 = Private, for-profit)
3 = Private, non-profit

2. In the table below, please indicate the number of subscribers (for health insurance only) to your organization at the end of the reporting period. If health insurance is included as a part of other insurance, please include those subscribers in your figure.

3. In the table provided below, indicate your organizationís total revenues for the reporting period. If possible, use earned figures rather than cash figures.

Type of revenue	Amount (in crowns)		
	Total	Group/ company	Individual/ family
Premiums (health business only)	5 410	2 130	3 280
Less: Premium discounts and rebates (health business only)	0		
Grants from Government of Appia:			
Cash	0		
Kind (estimates)	0		
Foreign assistance in form of:			
Loans	0		
Grants and donations	0		
Others (specify):	0		
Total (health business only)	**5 410**	**2 130**	**3 280**

Reporting basis: (Accrual)
Cash

Exhibit 9.1 Appia: national health accounts 2002. Health insurance questionnaire (continued)

4. In the table provided below, indicate your organization's total expenditures for the reporting period. If possible use incurred figures rather than cash figures.

Type of expense	Amount (in crowns)		
	Total	Group/ individual	Individual/ family
Benefits:			
Government hospitals	0		
Other government facilities	0		
Private-for-profit hospitals	123		
Other private-for-profit facilities	216		
Private non-profit hospitals	437	UNKNOWN	UNKNOWN
Other private non-profit facilities	1 020		
Reimbursement made directly to policy holder	2 640		
Other	0		
Total benefits	4 436		
Additions to reserves (health business only)	0		
Administrative expenses (health business)	564		
Surplus or retained earnings (health business)	410		

Reporting basis: (Accrual) / Cash

5. Do the revenue figures above include the health portion of premiums for combined life/health policies? (Not Applicable) / Yes / No

If **no**, please enter total benefits paid under such combined policies in the reporting year:

Life	Health

Exhibit 9.2 Appia: national health accounts 2002. Employer survey

Form ID No.___/___

1. General information

Firm name: _____
Name of person interviewed: _____
Date of interview: _____
Reporting period–Calendar year 2002 or: _____

Firm ownership (circle one)
1 = State-owned/parastatal
(2 = Private sector, for-profit)

Principal activity (circle one)
1 = Agricultural
2 = Mining or petroleum extraction
3 = Industrial
4 = Wholesale or retail trade
5 = Finance, insurance, or real estate
6 = Services
7 = Other

How many full-and part-time employees om the last day of the reporting period? _____

2. Did your firm provide medical insurance in the reporting period?
Yes
No --> (Skip to question 3.)

a. Number of employees covered by insurance: _____

b. Does the insurance cover dependants?
Yes
No

c. How much did your firm pay in premiums? 2 070 (survey error 5%)

d. Do your employees contribute to private health insurance?
No
(Yes -->) How much? 2/3 of total
Is this included in item 2c? (Yes) No

e. Which types of health care services are covered? (check all that apply)
X Inpatient curative care
X Day cases of curative care
X Outpatient curative care
X Basic medical and diagnostic services
X Medical mental health and substance abuse therapy

Exhibit 9.2 Appia: national health accounts 2002 - employer survey (continued)

X Ambulatory surgical procedures
X Outpatient dental care
X All other specialized medical services
X All other outpatient curative care
X Services of curative home care
X Inpatient rehabilitative care
X Services of rehabilitative home care
X Inpatient long-term nursing care
X Day cases of long-term nursing care
X Long-term nursing care: home care
X Clinical laboratory
X Diagnostic imaging
X Patient transport and emergency rescue
X All other miscellaneous ancillary services
X Prescribed medicines
X Over-the-counter medicines
X Other medical non-durables
X Glasses and other vision products
X Orthopaedic appliances and other prosthetics
X Hearing aids
X Medico-technical devices, including wheelchairs
X All other miscellaneous medical goods

3. During the reporting period, did your firm reimburse employees for medical expenses they incurred?
Yes
(No -->) (skip to question 4)

a. How much did your firm provide to employees in direct reimbursements?
NONE

b. Which types of health care services does your firm reimburse? (circle all that apply)
X Inpatient
X Outpatient
X Drugs
X Other

c. Does your firm keep records on the amount spent to reimburse for services purchased at private and public health care facilities?
Yes ->
Public facilities _____
Private facilities _____
(No)

4. During the reporting period, did your firm provide on-site health services for employees?
(Yes)
No --> (skip to question 5)

a. How much did your firm spend to provide on-site health services?
3 024 (survey error 5%)

b. Does the government or any nongovernmental organization make contributions to support your health facilities? If so, how much?
Yes -> How much? _____
(No)

Exhibit 9.2 Appia: national health accounts 2002. Employer survey (continued)

c. How many health care facilities does your company provide? Where are they located in the country?	_____ _____ _____	
d. What types of health services are available in these facilities? (circle all that apply)	X Inpatient (X) Outpatient X Drugs X Other	
e. Do employees pay for services and/ or medication offered in these facilities?	Yes -> (No)	How much? _____
5. Does the government or any other organization make a contribution to health care benefits provided by your firm?	Yes -> (No)	How much?

Exhibit 9.3 Appia: national health accounts 2002. Government survey of external aid contributions to health

Instructions: The Ministry of Health is conducting a study to estimate the total amount of health financing in Appia and how health funds flow from sources to users. In the space below, please indicate the projects that your organization supports, the amount you contributed in 2002, and the name(s) of the institution(s) that benefited from your contributions. We are particularly interested in knowing who used your contributions, so please be specific. For example, if contributions were made to the Government of Appia please indicate whether the beneficiary institution was the Ministry of Health, Ministry of Education, etc. If regional governments were the beneficiaries, please list which ones. Similarly, please list the nongovernmental organizations that received support. Thank you.

The information provided will be treated with strict confidentiality.

1. General information

Donor name:	AGGREGATION
Respondent name:	
Date:	
Phone number:	
Reporting period–Calendar year 2002 or:	

2. Project funding during the current reporting period (only show funds actually disbursed)

Project title	Amount contributed (use most convenient currency)	Beneficiary institution(s)
1. Bilateral family planning programme with Ministry of Health	1 538	Ministry of Health
2. Project Hope screening programme	1 653	Appia Red Crescent
3. Project Hope pilot test of smoking cessation campaign	300	Coastal Region Health Department
4. Doctors without Borders	599	-
5. Total	4 090	

(Add another sheet for more projects)

3. Please indicate the amount that your organization spent in the current reporting period to support your activities (i.e. administration, programme support) in Appia as well as the amount spent on technical assistance not included in the amounts above (please identify currency unit) NONE

Exhibit 9.4 Appia: national health accounts 2002. Nongovernmental organization questionnare

Form ID No.___/___

The information provided will be treated with strict confidentiality.

1. General information

Name of nongovernmental organization: AGGREGATION
Name of respondent: _____
Position of respondent: _____
Date of interview: _____
Location: _____
Reporting period–Calendar year 2002 or: _____

2. Indicate in the table below the amount of revenue obtained by your organization in this reporting period.

Source of Revenue	Amount (in crowns)
Cost sharing schemes	0
Grants from Government of Appia in:	
· Cash	0
· Kind (estimates)	0
Foreign assistance in form of:	
· Loans	0
· Grants/donations	1 653
Others (specify): LOCAL PHILANTHROPY	1 235
Total	2 888

3. Indicate in the table below the amount your organization expended on the following activities in this reporting period.

Activity	Amount (in crowns)
Primary care services	286
Secondary/Tertiary care services	263
Training	0
Research	230
Information, education and communication	1 893
Administration	216
Other (specify):	
Total	2 888

Exhibit 9.5 Appia: national health accounts 2002. Special tabulation of household survey

Category of expenditure	Amount
Payments to National Insurance Agency	11 626
Payments to private medical insurance	44 00
Co-payments at hospitals	13 643
Co-payments at polyclinics	11 965
Purchase of prescription drugs	41 042
Payments to other health practitioners	19 763
Total	102 439

Prepared by Appia Statistical Agency 28/05/2003
Note: Estimates have a 5% margin or error at the 95% confidence level.

Exhibit 9.6 Appia: national health accounts 2002. Preliminary list of possible financing agents and their codes

Financing Agent Code	Description
HF.1	Total government
HF.1.1	General government
HF.1.1.1	Central government
HF.1.1.1.1	Ministry of Health
HF.1.1.1.2	Ministry of Education
HF.1.1.1.3	Ministry of Defence
HF.1.1.2	State/provincial government
HF.1.2	National Insurance Agency (NIA)
HF.2	Total private
HF.2.1	Group insurance
HF.2.1.1	Government employees' health insurance programme
HF.2.1.2	Private-sector employee group insurance
HF.2.2	Voluntary medical insurance
HF.2.3	Private household out-of-pocket payment
HF.2.4	Nongovernmental organizations
HF.2.5	Firms and employers
HF.2.5.1	Nationally owned electric utility (AZap)
HF.2.5.2	Other private firms and corporations
HF.3	External organizations

Chapter 10

Making a first approximation of financing agent funds

10.1. Once a list of financing agents has been written down, it is time to fill in some numbers for each potential agent. These agents are still only "potential" at this point, because in this step it may turn out the entity is not really a financing agent after all.

10.02. In evaluating the spending by each financing agent, that spending must be divided into three parts. One part is money spent directly on health care. This may be money used to operate a facility owned by the FA, such as a ministry of health hospital or polyclinic. It also may be money given to a provider of care for services rendered to a person, such as payments by a voluntary medical insurance company to a physician for care provided to an insured person. Or it may be spending made for public health, or for health research, or for construction of medical facilities, or for administration of health programmes.

10.03. The second part of health spending by each potential financing agent is money that is given to some other person or organization to spend for health care as described in the preceding paragraph. For example, the ministry of health may transfer funds to a regional government to fund health programmes. Or private employers may make insurance premium payments to private social insurance companies to purchase health care coverage for employees. In both cases, the money is used for health care, but the ministry of health does not interact with providers of care in this example, nor does the private employer. It is important to keep track of these funds for later use, but they will not be included as part of the total for financing agents in the table under development (see Box 10.1).

10.04. The third part of spending by each potential financing agent is money that is not used for health care. Not all spending labelled "health" is appropriate for inclusion in the national health accounts (NHA). Considering the definitions of health spending in Chapter 3, ministry of health spending for old-age retirement homes, for example, may fall outside the boundaries of health care, even though the ministry may own the facilities. This third part of spending will be set aside and not used in the health accounts.

Box 10.1
The importance of documentation

Literally hundreds of decisions are involved in preparation of a typical set of health accounts. Thorough documentation of each decision at the time it is made allows for a quality control check and facilitates replication of the accounts in future cycles. Prompt documentation is desirable because the hundreds of decisions made can blur memories.

Too often, documentation is the final step of the accounting process — a step that is omitted for "lack of time". This is unfortunate, because the failure to document today typically leads to backtracking and following dead ends tomorrow.

The components of this documentation are not unique to health accounting. Information should be recorded for:

- institutions: contact persons, name, position, general characteristics of the interchange (for example periodicity of the reports);
- information sources obtained, including the reason why a specific data source has been selected and key factors surrounding the data analysed;
- data adjustments performed and the underlying rationale, the relevant reference values, the results of surveys tapped, the names of key informants who contributed to the evaluation of the quality of specific entries, etc.

Health accountants are advised to keep a journal close at hand. A few minutes taken at the end of a meeting or the end of a day will save hours later.

10.05. The existence of a public expenditure review can be of great help at this step in the estimation process. Health accountants should check for the existence of such an exercise; once reviewed for its quality, many of the figures it contains can be used to establish or verify an estimate for many of the financing agents in the health system.

10.06. When entering the expenditure figures for the various financing agents listed in Chapter 9 it is probably easiest to start with central government units, as those records are often the easiest to obtain. Using ministry or agency records, the amounts for each financing agent are summed, keeping separate track of the money they spend on health care and the money they transfer to others to spend on health care. Care should be taken that records are searched both for capital spending (investment) and current spending (operations), because the government may keep track of those amounts in separate places in their records. Using the classification schedule for resource costs can help to focus attention on the appropriate expenditures to include.

10.07. The key to identifying government units as financing agents is their programmatic responsibility. Entities that act only as audit or disbursement agents are not classified as financing agents, even though they may play an active role in assuring that health funds are spent wisely. For this reason, it is likely that the ministry of finance will not appear in the list of financing agents, because typically the ministry of finance simply acts as an agent to disburse funds, without any programmatic responsibility for health care. The ministry of finance can, however, be a very valuable source of information on what other ministries spend on health. Often, ministry of finance staff maintain detailed records of flows of money, which can be an excellent starting place in constructing this part of the accounts.

10.08. The exception to the rule just stated is when one government entity subsidizes a health care entity without seeking to intervene in decisions. In that case, the government entity may be a financing agent. For example, if the government power utility writes off the debt of ministry of health hospitals, the utility has contributed to financing health care and should be listed as a financing agent, although it may only appear in a summary category such as "other government financing agents". This is so even though the utility has no specific programmatic mandate to fund health care operations.

10.09. When looking at firms, it is important to count and keep separate taxes paid to social security, payments to private social insurance schemes, payments to providers of care, and payments to maintain the firm's own health facilities (if any).

10.10. Similarly, employee taxes paid to social security, employee payments for private social insurance, household payments for voluntary medical insurance, and household payments to providers should all be kept separate when adding up total household spending.

10.11. Next to each of the potential financing agents listed in Table 9.1, the estimated amount of funds used for health care should be entered. The amount transferred to others should not be included, and any potential financing agent determined not to engage in direct spending for health care should be removed from the list.

Questions related to estimating spending totals for financing agents

10.12. As with the definition of financing agents, associating a spending figure with each agent is not always straightforward. Some of the common questions faced by health accountants are dealt with below.

Working with more than one estimate of spending

10.13. What should the health accountant do if faced with different estimates of spending by financing agents? At this stage of the process, it is best to make a preliminary assessment as to which estimate is more reliable. It is also a good idea, however, to keep all the estimates at hand, as the reconciliation stage which follows may reveal more about the relative strengths of the estimates.

When no figure is available for the spending of a known financing agent

10.14. What should the health accountant do when an entity is known to be a financing agent but no figure is available for that agent's spending? At this point, not much can be done. The best course of action is to leave the financing agent in the list without any associated amount. In later steps there may be an opportunity to estimate a figure for the financing agent. (In one sense, this is just a special case of there being a number of possible values for the spending of financing agents.)

User charges at government facilities

10.15. User charges at government facilities definitely should be included in the accounts to the extent that they support and maintain health facilities or programmes. The question is which entity to credit as the financing agent. In many countries, user charges for health services delivered by publicly funded health facilities are retained by the facility concerned or considered part of that facility's budget (for example, most cost recovery programmes implemented in Africa and in Latin America in the 1980s and 1990s). In other countries, the fees are returned to the central ministry and are included in that budget. Regardless of the arrangement, where the fees have been paid by consumers in return for delivery of services, the household is the appropriate financing agent (for the amount of the fees). Expenditures by government as a financing agent should be net of those fees. For example, suppose that the ministry of health operates a hospital at a cost of 2500, and that the hospital collects 150 in user charges from households. In the accounts, households would be the financing agent for 150 and the ministry of health would be the financing agent for 2350, for a total of 2500. If user fees are returned to the ministry of health, it is essential that they not be included in the ministry's outlays in order to avoid double counting those expenditures. However, if the fees are retained as additional resources by providers, i.e. supplement ministry of health spending, they do not need to be subtracted from the ministry total.

Indirect expenditures for support and maintenance

10.16. It is easy to overlook indirect expenditures for support and maintenance, because it is not uncommon for support services necessary for the maintenance of core health programmes to be budgeted under and provided by other non-health departments. Typical examples include provision of building construction and maintenance services by public works departments, printing of hospital forms and stationery by government printing departments, and auditing services by the government auditor. To the extent that these are support services related to the direct production of health services they should be treated as inputs to the production of health services. Otherwise, problems will arise in comparing government and private spending or in comparing the country's spending with that in other countries. While preparing the estimates, it may be advisable to keep each support agency as a separate financing agent, consolidating them in presentation tables.

Non-contributory pensions and other staff benefits

10.17. In many countries, personnel working in the health system receive forms of compensation that are not recorded in the budgets of the relevant organizations (see Box 10.2). A typical example of this is non-contributory pensions, which are funded by the government from general revenue and which are not recorded as expenditures of the employing agency. In theory, the portion of these benefits that goes to health system workers is health expenditure and should be counted as such, with general government or the pension department listed as the financing agent. In practice, the value of unfunded pensions is often impossible to determine, and this problem is ignored. If data do exist, however, an imputation should be made to reflect the value of such unfunded benefits in current expenditures.

Box 10.2
Treatment of pension benefits to health workers in the health accounts of the Hong Kong Special Administrative Region of China

In what is now the Hong Kong Special Administrative Region of China, organizational changes in the early 1990s led to the transfer of most government health personnel from a government department with civil service terms and conditions of employment to a non-departmental agency with compensation arrangements similar to those in the private sector. These changes included a shift from an unfunded civil service pension scheme to a fully-funded contributory pension scheme.

Because valid comparisons of expenditures before and after the reform were needed, the health accounts include in current health expenditures an estimate for the implicit pension benefits received each year by civil servants.

Insurance benefits or insurance premiums?

10.18. Actually, both insurance benefits and insurance premiums are used in the accounts. The benefit figure is used to estimate total personal expenditure on health, and the premium figure (together with any subsidies) is used to calculate national health expenditure. The difference between premiums and benefits, which is called the net cost of health insurance, is classified among the administrative functions. If this figure is negative, a financing source in FS.2.4.2 should be established to channel funds from retained earnings to current operations. However, entities cannot finance losses from retained earnings for long without becoming insolvent, so it is prudent to check for the existence of subsidies from government or from external sources as a form of revenue of insurance companies.

Government (or some other entity) supplements or subsidies of private social or voluntary insurance premiums

10.19. If an insurance scheme truly is private — that is, not controlled by the government — then the government (or other entity) should be shown as a source of funds for the insurance scheme to the extent of any subsidy. Of course, if the government materially controls the insurance scheme, then the scheme is not truly private and should be treated as an extrabudgetary entity. The total addition to national health expenditure of the insurance scheme is the value of the premiums it earns plus subsidies received to supplement those premiums.

When there is only a benefit figure (or only a premium figure) for insurance

10.20. In the case of there being only a benefit figure for insurance, the premium figure must be estimated. This can be done by finding or estimating what is called a "loss ratio", which is the ratio of benefits to premiums, and dividing aggregate benefits by that ratio. Alternatively, an estimate of total administrative expenses (either in monetary units or as a percentage of benefits) could be added to total benefits. These estimates or figures can come from consultation with knowledgeable people, from experiences in countries similar in terms of the maturity of the insurance industry, or from some other type of process (such as the professional judgement of the NHA team). If all that is known is the premium figure, benefits must be estimated through the reverse of the process described.

Accounting for spending by external organizations

10.21. The provision of external assistance for health in low-income and middle-income countries poses particular problems for NHA analysts. Generally, expenditures from international organizations, both cash and in kind, whose primary purpose is the production of health and health-related goods and services for the residents of the recipient country should be counted as part of the health expenditure of that recipient country. In contrast, activity of such organizations where the primary purpose is to assist the external organization with the planning and administration of such assistance should not be counted as expenditure in the recipient country's NHA. For example, the costs associated with the embassy staff who report on programme activities to the donating country should be excluded.

Loans made to or repaid by a financing agent

10.22. As a conceptual matter, the actual loan itself made to a financing agent does not appear in the NHA because it changes the balance sheet (assets and liabilities) of the financing agent. What *does* appear in the health accounts is the money that the financing agent releases into the health care system. Since most loans are spent as soon as they are disbursed, the distinction matters more for the purposes of attributing the funds to a financing source than for the level of health expenditure (see Box 10.3).

Box 10.3 Handling loans in health accounts

Loans increase the funds available to a provider or financing agent, but they should not be included directly in the health accounts. A simple example may help to show the proper treatment of the amounts.

Because loans affect the assets of the entity, two sets of accounts are needed – "current-account", which track revenues and expenses, and "capital-account", which track assets and liabilities. The loan itself affects the capital account (or balance sheet). Consider a hypothetical situation in which a loan of 100 national currency units (NCU) is received by a non-market financing agent:

Capital account: balance sheet at beginning of year

Assets		Liabilities	
Cash	5	Accounts payable	0
		Net worth	5
Total assets	**5**	**Total liabilites**	**5**

Current account: operations during the year

Expense		Income	
Benefits	110	Premiums	80
		Own resources	30
Total	**110**	**Total**	**110**

Box 10.3 Handling loans in health accounts (continued)

Capital account: balance sheet at end of year

Assets		Liabililities	
Cash on hand at beginning of year	5	Accounts payable	100
Cash received from operations	+80	Net worth	-25
Cash received from loan	+100		
Cash disbursed	-110		
Total assets	**75**	**Total liabilities**	**75**

During the course of the year the cash position of the financing agent has increased 80 NCU because of premiums earned, has increased 100 NCU because of the loan received, and has decreased 110 NCU because of benefits incurred (for simplicity, it is assumed that premiums are received and benefits are paid in the same accounting year in which they are earned or incurred). However, what matters in the health accounts is not the cash position of the financing agent, but rather the current account register of expenses and revenues. Only the 30 NCU injected into the health system from the financing agent's own resources (a combination of cash on hand and loans) is counted in the current year's health accounts.

10.23. Loan repayments do not appear in the health accounts because they, too, represent a change in assets rather than a current expenditure for health. In effect, they are funds that were already registered in the health accounts when the disbursement was spent.

10.24. It is appropriate to include interest payments made on outstanding debt as part of health spending, provided that the debt was directly related to the financing agent's health activity.

10.25. Most accounting systems separate loans and loan repayment from other transactions, so this treatment is not difficult to implement in practice. In systems where such a separation is not made, health accountants should be on the lookout for budget line items that indicate the infusion of new capital or the repayment of loans or retirement of other debt, and eliminate those entries from the total for the financing agent.

10.26. If it is important from a policy perspective to show the effect of new loans or of loan repayments on a given financing agent or class of financing agents, this can be done in an exhibit table. An example of such an exhibit table is shown in Box 10.4. This type of exhibit can inform policy-makers without detracting from the presentation of the current state of the health care system's ability to deliver care.

Box 10.4 Example of an exhibit table showing changes in debt related to the health system

Exhibit X. Changes in the financial position of financing agents			
	Total	Government	Private
Total national health expenditure			
Less: net increase in health-related debt			
New loans for health			
From external organizations/entities			
Governments			
Development agencies			
NPISHs*			
Other			
From domestic lenders			
NPISHs*			
Other			
Less: repayment of loans			
To external organizations/entities			
Governments			
Development agencies			
NPISHs*			
Other			
To domestic lenders			
NPISHs*			
Other			
Equals: spending from own resources			
Less: draws on own assets			
Equals: spending from current income			

*non-profit institutions serving households

Using T-accounts in health accounting

10.27. It is important to be systematic when recording figures for the various financing agents in the health care financing system. Given the huge number of figures to be sorted through, it is easy to lose track of a particular figure or to allow the accounts to get out of balance. For this reason, a simple tool called the T-account is very useful for health accounting. It provides a structure that not only encourages careful thinking about decisions but also helps maintain the equality of the row and column sums of the tables to be developed.

10.28. The T-account has its origins in bookkeeping and is a tool frequently used by national income accountants. It is so called because the presentation appears to have the letter T as its frame (see Box 10.5). Expenditures are listed on the left side of the account, and revenues on the right side of the account. The inviolable rule of T-accounts is that the sum of entries on the left and right sides must always be equal: every bit of revenue must be accounted for by some expense or retention. For the purposes of health accounting, the opposite also holds true: every bit of spending on health by a financing agent must be matched by revenue from some source.

Box 10.5

The T-account

Expenditure	Revenue
Category 1	Revenue type 1
Category 2	Revenue type 2
Category 3	Revenue type 3
etc.	etc.
Total expenditure	**Total revenue**

In a T-account, total expenditure always equals total revenue. A "balancing entry" is included on one side of the account or the other to make this happen. For example, in provider accounts, "net profit/loss" is shown on the left-hand side of the T-account to reflect the difference between revenues received (or earned) and expenses paid (or incurred). In health accounting, especially with financing agents, the balancing entry often appears on the right side, labelled "own resources" or a similar phrase.

10.29. It is not necessary to work through the entire income and expenses of a financing agent in order to complete the T-account for the NHA. All that is needed is to identify the money outflow attributable to health, and then to identify the source of that money. For example, if the ministry of education spends a fraction of its budget on health, only that fraction will appear on the left side of the T-account. If all the ministry of education's spending is made from general revenue, then the entry on the right side of the account is general revenue sufficient to cover the left side. On the other hand, if the ministry of education has a specific source of income for health activity (say, a grant from an external resource or from a nongovernmental organization), then that amount appears on the right side of the T-account along with a balancing amount of general revenue, if needed. Use of T-accounts will be demonstrated in the Appia example to follow.

Estimating financing agent amounts in Appia

10.30. Because the spending of each financing agent is going to be allocated to particular sources of funds in the next stage of this estimation process, the team decides to prepare this information at the same time as it prepares the totals for financing agents, if doing so does not seriously slow its progress. This means that the team must create a list of revenues that balances the list of expenditures counted as health, recognizing that the list will be very rough and will be revised as its work progresses. The team uses T-accounts for this purpose and records figures in terms of the national currency unit — the crown (¢).

10.31. First, the team obtains the Ministry of Health actual accounts (reproduced in Exhibit 10.17, see page 153). Reviewing the ministry records, the team concludes that everything in the ministry's budget is spent on things that fall within the definition of health, except for most of their operation of orphanages. For that reason, the budget amounts spent on orphanages (Ministry of Finance code 7.02.00) are subtracted from the Ministry of Health total, except for Ministry of Finance code 7.02.06 (Exhibit 10.1). Most Ministry of Health programmes are funded from general revenue, but ministry staff also report that the ministry had struck an agreement with an international organization for a particular public health programme, for which the external resource had contributed money. The amount of the external resource

funds is entered, and then enough general revenue funds are added to balance the Ministry of Health account. (Later, the team will discover that several refinements are needed to this initial rough draft.)

Exhibit 10.1

Appia: Ministry of Health consolidated health spending T-account (HF.1.1.1.1)
Calendar year 2002 (millions of crowns)

Expenditure			Revenue	
Gross spending		33 478	External organiztions	1 538
Subtract out of scope spending (7.02.00)	-1 600		General revenue to balance	30 558
Add back medical supplies (7.02.06)	218	-1 382		
Total		**32 096**	**Total**	**32 096**

Source: Ministry of Finance, Materials on the Execution of the Federal and Consolidated Budgets.

10.32. Similarly, the team acquires access to the actual accounts for the Ministries of Education and Defence (Exhibit 10.2; for purposes of brevity, the full budget reports are not reproduced here). The team finds Ministry of Education spending on medical research and on the operation of a school of nursing. Ministry of Defence records show spending on ministry hospitals and clinics for military personnel, and ongoing construction of a new clinic.

Exhibit 10.2 Appia: Ministry of Education and Ministry of Defence consolidated health spending T-accounts (HF.1.1.1.2, HF.1.1.1.3)

(a) Appia: Ministry of Education consolidated health spending T-account (HF.1.1.1.2)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
Research centre	286	General revenue	329
Nursing school	43		
Total	**329**	**Total**	**329**

(b) Appia: Ministry of Defence consolidated health spending T-account (HF.1.1.1.3)
Calendar year 2002 (millions of crowns)

Expenditure			Revenue	
Hospitals		116	General revenue	635
Polyclinics		519		
Current operation	*506*			
Capital spending	*13*			
Total		**635**	**Total**	**635**

Source: Ministry of Finance, Materials on the Execution of the Federal and Consolidated Budgets.

10.33. The Ministry of Finance also provides the team with a compilation of regional government revenues and expenditures, from which are abstracted health expenditure figures (Exhibit 10.3). The Ministry of Health had provided funds to regional governments from the central budget in the form of grants. Regional governments also received payments for use of their hospitals and polyclinics, although those revenues are not identified in the Ministry of Finance documents, and they used some of their own tax revenue to fund health care. As with the Ministry of Health account, the explicit revenues are entered and then the account is credited with enough local revenue to balance it. The team is not concerned at this point with where the local revenue came from; it could have been from general taxes, or from a special tax, or even from borrowing; that can be sorted out later.

Exhibit 10.3

Appia: regional government health spending (HF.1.1.2)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
Hospitals	19 712	Ministry of Health grants	986
Polyclinic	521	Other revenue	20 029
Public health	726		
Administration	56		
Total	**21 015**	**Total**	**21 015**

Source: Ministry of Finance, Materials on the Execution of the Federal and Consolidated Budgets.

10.34. Colleagues at the National Insurance Agency provide the annual report for the agency, and the NHA team records the reported total income (Exhibit 10.4).

Exhibit 10.4

Appia: National Insurance Agency consolidated income and expenditure (HF.1.2)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
Benefits	54 319	Taxes	59 165
Administative costs	6 518	Transfers	1 106
		Interest	566
Total	**60 837**	**Total**	**60 837**

Source: National Insurance Agency Annual Report for 2002.

10.35. Telephone calls are made to two other entities known to be involved in health care financing. The national electricity utility, AZap, reports spending ¢1905 million for health care (Exhibit 10.5). The Appian Government Employees Health Fund provides an annual statement (Exhibit 10.6).

Exhibit 10.5

Appia: national electricity utility (AZap) health spending (HF.2.5.1)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
Outlays	1 905	Internal resources	1 905
Total assets	**1 905**	**Total**	**1 905**

Source: Telephone call to Ms Pilar (analyst in AZap comptroller's office) 25 February 2003.

Exhibit 10.6

Appia: Government Employees Health Fund (HF.2.1.1)
Calendar year 2002 (millions of crowns)

Expenditure			Revenue	
Benefits		511	Premium payments from Ministry of Finance	563
Hospital	109			
Polyclinic	402			
Administration		52		
Total		**563**	**Total**	**563**

Source: Government Employees Health Fund, annual report 2002.

10.36. Survey results from external organizations, insurers, employers, and nongovernmental organizations — all conducted as part of the NHA process — and results from the household expenditure survey are reviewed and figures for each of these financing agents are recorded as well (see Exhibits 9.1 through 9.5 on pages 130-137). The team decides to put in ranges of possible spending, reflecting the uncertainty that surrounds survey work. The survey of the private insurance industry turns out to have been a census — the phenomenon is new enough that only a handful of companies were engaged in the business in 2002, providing both group health and family/individual medical insurance in Appia. The team classifies the group business as social insurance (HF.2.1.2), because of the employer contributions and the limitation to employees and their dependants. The family/individual business is classified as voluntary medical (other private) insurance (HF.2.2). The amount that is recorded for each of these lines of business is total premiums, as that is the amount that these financing agents spent on health care (including the administration of the schemes).

10.37. In the survey of firms, employers reported premiums for both themselves and their employees in the social insurance scheme. But because the social insurance company is the financing agent, not the firm, the team sets those numbers aside when adding up the figures for the employer as a financing agent (Exhibit 10.8); they will be used later on in building the financing sources by financing agents (FSxFA) table.

Exhibit 10.8

Appia: private employers/firms worksheet (HF.2.5.2)
Calendar year 2002 (millions of crowns)

Expenses		Revenues	
~~Premiums~~	~~2 070~~	Own revenues	3 024
Direct spending	3 024		
Total assets	**3 024**	**Total**	**3 024**
95% confidence interval:	2 873 - 3 175		

Source: Appia National Health Accounts 2002 Employer Survey.

10.38. Similarly, when working with the household survey, the team recognizes that household payments to the National Insurance Agency and for private insurance premiums are made in the household's capacity as a source rather than a financing agent. So, those figures are set aside for the moment and only the direct payments for care are included in the entry for HF.2.3 (Exhibit 10.9).

Exhibit 10.9

Appia: households worksheet (HF.2.3)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
~~Payments to NIA~~	~~11 626~~	Own resources	86 413
~~Payments to private medical insurance~~	~~4 400~~		
Co-payments at hospitals	13 643		
Co-payments at polyclinics	11 965		
Purchase of prscription medicines	41 042		
Payments to other health practitioners	19 763		
Total (point estimate)	**86 413**	**Total**	**86 413**
95% confidence interval: 82 092 - 90 734			

Source: Special tabulation from Appia Statistical Agency (Household Budget Division), dated April 28 2003

10.39. The census of donor activity in Appia revealed four programmes. However, two of them appear to take the form of a transfer to other entities (the bilateral family planning programme and the smoking cessation programme), so the team does not count those expenditures when calculating the financing agent total (Exhibit 10.10).

Exhibit 10.10

Appia: external organizations worksheet worksheet (HF.3)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
~~Bilateral family planning~~	~~1 538~~	Own resources	2 252
Screening programme	1 653		
~~Smoking cessation~~	~~300~~		
Doctors without Borders	599		
Total	**2 252**	**Total**	**2 252**

Source: 2002 Government of Appia Survey of External Aid Contributions to Health

10.40. The result of this first step in the estimation process is a list of financing agents with provisional figures for their spending (Exhibit 10.11). This list and these figures must next be refined - a process described in Chapter 11.

Exhibit 10.11

Appia national health accounts: provisional list of financing agents and amounts spent
Calendar year 2002 (millions of crowns)

SHA Code	Entity	Amount
HF.1.1.1.1	Ministry of Health	32 096
HF.1.1.1.2	Ministry of Education	329
HF.1.1.1.3	Ministry of Defence	635
HF.1.1.2	Regional government	21 015
HF.1.2	National Insurance Agency	60 837
HF.2.1.1	Government Employees Health Insurance Programme	563
HF.2.1.2	Private group insurance	2 130
HF.2.2	Individual insurance	3 280
HF.2.3	Households	82 092 - 90 734
HF.2.4	Nongovernmental organizations2 888	
HF.2.5.1	Private firms	2 873 - 3 175
HF.2.5.2	National electricity utility (AZap)1 905	
HF.3	External organizations	2 252

Exhibit 10.7 Appia: Ministry of Health spending on health care by type of expenditure. (budget code 7.xx.xx)

Code	Spending by type	Crowns	Code	Spending by type	Crowns	Code	Spending by type	Crowns
7.00.00	**MINISTRY TOTALS**	**33 478**	**7.03.00**	**REGULATION OF PHARMACEUTICAL AND MEDICAL DEVICE INDUSTRIES**	**439**	**7.07.00**	**HOSPITAL CARE IN OTHER FACILITIES**	**5 299**
7.00.01	Wage fund	6 166	7.03.01	Wage fund	251	7.07.11	Other expenses	5 299
7.00.02	Additions to wages	1 953	7.03.02	Additions to wages	63			
7.00.03	Clerical and economic expenses	2 526	7.03.03	Clerical and economic expenses	125	**7.08.00**	**CARE IN POLYCLINICS AND AMBULATORIES**	**6 473**
7.00.04	Business trips and official expenses	1 194	7.03.04	Business trips and official expenses	0	7.08.11	Other expenses	6 473
7.00.05	Food expenses	835	7.03.05	Food expenses	0			
7.00.06	Acquisition of pharmaceuticals	1 700	7.03.06	Acquisition of pharmaceuticals	0	7.10.00	ASSISTANCE OF REGIONAL AUTHORITIES	986
7.00.07	Acquisition of equipment and inventory	1 375	7.03.07	Acquisition of equipment and inventory	0	7.10.11	Other expenses	986
7.00.08	Acquisition of soft goods and uniforms	40	7.03.08	Acquisition of soft goods and uniforms	0			
7.00.09	Capital investment	804	7.03.09	Capital investment	0	**7.11.00**	**ASSISTANCE OF NATIONAL INSURANCE AGENCY**	**1 106**
7.00.10	Maintenance	549	7.03.10	Maintenance	0	7.11.11	Other expenses	1 106
7.00.11	Other expenses	16 336	7.03.11	Other expenses	0			
7.01.00	**OPERATION OF MINISTRY HOSPITALS**	**9 387**	**7.04.00**	**ACTIVITIES AGAINST EPIDEMICS**	**3 338**			
7.01.01	Wage fund	1 963	7.04.01	Wage fund	1 001			
7.01.02	Additions to wages	818	7.04.02	Additions to wages	334			
7.01.03	Clerical and economic expenses	1 227	7.04.03	Clerical and economic expenses	334			
7.01.04	Business trips and official expenses	41	7.04.04	Business trips and official expenses	835			
7.01.05	Food expenses	573	7.04.05	Food expenses	0			
7.01.06	Acquisition of pharmaceuticals	981	7.04.06	Acquisition of pharmaceuticals	501			
7.01.07	Acquisition of equipment and inventory	900	7.04.07	Acquisition of equipment and inventory	0			
7.01.08	Acquisition of soft goods and uniforms	40	7.04.08	Acquisition of soft goods and uniforms	0			
7.01.09	Capital investment	717	7.04.09	Capital investment	0			
7.01.10	Maintenance	491	7.04.10	Maintenance	0			
7.01.11	Other expenses	1 636	7.04.11	Other expenses	333			
7.02.00	**OPERATION OF MINISTRY ORPHANAGES**	**1 600**	**7.06.00**	**MISCELLANEOUS HEALTH-RELATED ACTIVITIES**	**1 924**	**7.12.00**	**MAINTENANCE OF CENTRAL ACCOUNTING SYSTEM**	**2 926**
7.02.01	Wage fund	364	7.06.01	Wage fund	1 490	7.12.01	Wage fund	1 097
7.02.02	Additions to wages	73	7.06.02	Additions to wages	299	7.12.02	Additions to wages	366
7.02.03	Clerical and economic expenses	291	7.06.03	Clerical and economic expenses	0	7.12.03	Clerical and economic expenses	549
7.02.04	Business trips and official expenses	0	7.06.04	Business trips and official expenses	135	7.12.04	Business trips and official expenses	183
7.02.05	Food expenses		262	7.06.05 Food expenses	0	7.12.05	Food expenses	0
7.02.06	Acquisition of pharmaceuticals	218	7.06.06	Acquisition of pharmaceuticals	0	7.12.06	Acquisition of pharmaceuticals	0
7.02.07	Acquisition of equipment and inventory	73	7.06.07	Acquisition of equipment and inventory	0	7.12.07	Acquisition of equipment and inventory	402
7.02.08	Acquisition of soft goods and uniforms	0	7.06.08	Acquisition of soft goods and uniforms	0	7.12.08	Acquisition of soft goods and uniforms	0
7.02.09	Capital investment	87	7.06.09	Capital investment	0	7.12.09	Capital investment	0
7.02.10	Maintenance	58	7.06.10	Maintenance	0	7.12.10	Maintenance	0
7.02.11	Other expenses	174	7.06.11	Other expenses	0	7.12.11	Other expenses	329

Source: Ministry of Finance, Materials on the Execution of the Federal and Consolidated Budgets.

Chapter 11

Estimating the financing sources by financing agents table

11.01. With the tentative list of financing agents (Chapter 9) in hand and a first approximation of their funds (Chapter 10), the next step is to create a table refining the estimates for these financing agents and connecting them with another dimension of the health accounts. In practice, most countries have found it useful to make the connection with either the provider dimension or the financing sources dimension. Each has strengths and weaknesses, and the choice in any given situation should be the dimension for which it is felt that data are more robust. This *Guide* demonstrates how to proceed in estimating the financing sources by financing agents (FSxFA) table first.

11.02. The broad categories of financing sources discussed in Chapter 4 are shown in Table 4.5. It could be argued that households ultimately bear the full cost of health care funded by business or government — through higher prices, lower wages, or higher taxes. However plausible theoretically, in practice that allocation does little to inform policy. For that reason, the classification of national health accounts (NHA) sources shows the following: revenues generated by government through taxation; payments made by parastatal and private employers in terms of premiums and direct payments for care; household payments of premiums and direct purchase of care; grants, loans, and direct operations of nongovernmental organizations and rest-of-the-world organizations; and other financing sources external to the total health system.

Evaluating each financing agent's financing sources

11.03. A list must be developed for each financing agent, showing where the funds they spent came from. Sometimes this is easy; for example, programmes that are financed exclusively from general tax revenue have only one source. Sometimes this is tautological: for example, households' spending for health (HF2.3) comes — by definition — from household income, and firms' spending (HF.2.5) comes from the enterprises themselves. More often, financing agents have multiple financing sources. For example, private insurance schemes (HF.2.1) may receive premium revenue from employers and from households; social security schemes (HF.1.2) may receive payroll taxes paid by firms, payroll taxes or premiums paid by households, and general revenue from the treasury.

11.04. To the extent that T-accounts have been used to develop the estimates of financing agent spending, much of the work of sorting out financing sources will already have been done. But this is an opportunity to review each entry in the T-account, as it may be that some of the money ascribed to a particular financing agent really should be classified as a transfer to some other entity. It is important that such misclassifications be corrected, as otherwise those funds will be counted twice and will destroy the integrity of the accounts. (An example of this type of correction appears in the Appia example in this chapter.)

11.05. Often there are multiple layers through which funds travel from their source to the eventual financing agent. The task facing the health accountant is to trace the funds back to their original source: general government revenue, employers or firms, employees or households, nongovernmental organizations, or funds from outside of the country (i.e. external organizations).

Summing financing sources and checking for reasonableness

11.06. Once each financing agent's funds have been decomposed into their original sources, a table is constructed to contain the figures. This table was discussed in Chapter 5 and in its working version will look something like Table 11.1. There likely will be more detail in this table than will be published; this is to make cross-checking and replication easier. The cells of the table are summed to find a trial sum of total spending for each column.

Table 11.1 Financing sources by financing agents (FSxFA) table (working outline)

Financing agents (FA)	Financing sources (FS)			
	FS 1	FS 2	etc.	Total
FA 1				
FA 2				
etc.				
Trial sum				
Estimated total				

11.07. This table facilitates some reasonableness checks on the figures. The final row (giving the estimated total) contains a figure for any financing source for which there is an independent source of information. For example, external organizations may have their own annual reports on how much they granted or spent. Often there is no such independent source, and so many of the cells in this row will be empty. If there is an independent figure, that figure is then compared with the trial sum. If the two are not close, this is an indication that the data sources used, and the manipulation of the data they provided, must be re-examined. Even if the two figures are close, additional steps are necessary.

11.08. Next, cell entries for which there is more than one source of data should be examined. For example, are firms' payroll tax payments for social insurance consistent with receipts recorded by the social insurance organization? Do external organizations' records and government records agree on the level of external assistance used for health care? Figures will seldom agree exactly, but if they are close there can be more confidence in the amount entered; use the source likely to be most accurate. Where the figures disagree to a significant amount, more examination is needed (see Box 11.1). Are there definitional differences in the figures? Timing differences? Cash versus accrual differences? Is one figure very tentative and the other less so? Again, the figure in which there is the most confidence should be used; if neither is particularly reliable, the range of estimates should be left in place for the moment.

Box 11.1
How much is "a significant amount" of difference?

Health accounting is as much an art as a science, so it is not really possible to give a specific answer to the question of how much is "a significant amount" of difference. The acceptable level of difference depends partly on the type of data being dealt with and partly on the size of the total estimate.

For example, when dealing with reliable audited expenditure data presented according to strict public accounting rules, one should be very suspicious of any differences and look for errors in data entry. On the other hand, when dealing with data that are known to be estimates, a more tolerant attitude can be adopted. For example, discrepancies of up to 50% could be accepted when dealing with estimates of traditional providers, subject to the following comment.

Whatever the type of data, the other important aspect is the size of the estimate itself. For example, a 15% discrepancy in a cell accounting for half of total spending is more serious than a 100% discrepancy in a cell contributing only 3% of the total. As a rule of thumb, there is cause for concern if a discrepancy between two estimates amounts to 2% of the total figure for national health expenditure.

As experience grows in dealing with data sources and in working with the health accounts, health accountants will also develop an intuitive sense of when a discrepancy is important.

11.09. Once a first pass through the cells is complete, the row and column totals (or "margins") should be examined. Do the relative sizes of the figures make sense? Just because they do make sense does not mean that they are right — and just because they seem surprising does not mean that they are wrong. The margins can be used to reassess cell entries, too. Some knowledge about the relative size of financing sources in aggregate can help to resolve those cells where there are contradictory estimates.

11.10. Finally, this checking stage is an opportunity to make sure that all potential financing agents have been identified. For example, does an external organization's records show funds transferred to an entity omitted from the initial list of financing agents? If so, the initial list must be revised to include the new financing agents, and then the steps above repeated. Or perhaps the external organization reports a grant given to an identified financing agent which did not report receiving the grant. If so, the T-account for the financing agent must be adjusted to reflect the additional report. Perhaps the total spending figure will change, perhaps only the relative sizes of funds from external organizations and own resources — this depends on the nature of the omission. (Of course, it is also prudent to check that the external organization reported correctly, as sometimes grants are mistakenly reported in multiple years — for example, a 3-year grant could be reported at its full level in each of the 3 years.)

11.11. These steps are designed to elicit additional information that suggests revisions in the initial measurements of expenditures by each financing agent. As always, such information should be incorporated by making appropriate revisions, so that the final accounts represent all available information. For example, data may indicate that the amounts provided by all financing sources are greater than the amounts initially estimated to be received by financing agents or generated from their own resources. Because the sum of row margins must always equal the sum of column margins in the table, revisions are needed — either to the initial measurements or to the new data — in order to balance the tables, taking into account the likelihood of possible causes of the discrepancy.

11.12. This type of analysis demonstrates why it is important to keep each financing agent separate to the extent possible. The level of disaggregation should be dictated by the "granularity" (level of detail) in the "raw" data.

Matters related to financing sources

11.13. There are matters related to identifying and classifying funds that require some elaboration.

Earmarked taxes, such as social security

11.14. In the NHA, taxes that are earmarked for social security are allocated to the source groups that paid them. Employers are the source of the taxes they pay, and households are the source of taxes paid by employees. The reason for this treatment is that such taxes are in essence a form of premium, and should be treated in the same way as premiums paid to private social insurance or voluntary medical insurance. Taxes used to support other government health care programmes are counted as general revenue, which is attributed to government as a source (see paragraphs 4.22 and 4.23).

Financing that comes from health-specific lotteries

11.15. In some countries, government programmes or the activities of nongovernmental organizations are partially funded by lotteries explicitly designed to produce health care funds. However, because lottery players are not obliged to participate, and do so with the intent of winning money rather than funding

health care, it is appropriate to treat lottery revenue as though it were general revenue. That is, the recipient programme or nongovernmental organization is treated as the financing agent, and government as the financing source (see paragraphs 4.23 to 4.25). If these lotteries have special policy significance, they can be assigned a unique subcategory code within the FS.1.1 category.

Treatment of special taxes

11.16. If a special tax (such as a transaction tax) is earmarked for health care purposes — even if it is levied on non-health activities such as bank transactions — it should still be treated as though it were general revenue, because it is essentially fungible with general tax revenue. Thus, the recipient government programme is treated as the financing agent, and the government as the financing source (see paragraphs 4.22 and 4.23). As with lotteries, if the special tax has policy significance it can be assigned its own subcategory within FS.1.1.

Funds transferred from the central government to regional governments

11.17. The distinction between a financing source and a financing agent is that the financing agent controls the use of the funds. When a grant-in-aid is used as a non-specific fiscal transfer from government unit A to government unit B, unit A should be considered to be the source and unit B to be the financing agent for the purposes of the health accounts. So, if the regional government has the discretion of dividing the money among various functions (including health), then the regional government is the financing agent and the central government is the financing source.

11.18. In theory, if unit A transfers funds to unit B specifically as a grant-in-aid or reimbursement for an explicitly identified health programme, unit A is the financing agent and the expenditure should not be counted with other spending by unit B, which is merely acting as an agent in this instance. For example, if the central government provides money to the regional government specifically to purchase pharmaceuticals for use in hospitals, then the central government is the financing agent, not the regional government. As a practical matter, however, funds are often fungible within a budget, so that provision of funds by unit A to unit B for a specific purpose may not result in an equivalent increase in expenditures related to that purpose. Therefore, if there is any doubt, unit A may be treated as the source and unit B as the financing agent whether the funds are targeted or not, and a separate supplementary table can be prepared to show the funding links between governmental levels if that information is wanted.

Calculating the financing sources by financing agents table in Appia

11.19. Having completed its preliminary list of financing agents (see Exhibit 10.11), the Appian NHA team now sets about disaggregating each financing agent's spending. The team assigns a code to each financing source, consistent with the scheme described in Chapter 4. The Ministry of Education and Ministry of Defence figures (see Exhibit 10.2 on page 148) seem straightforward, as their funds have already been identified as coming from general revenue. So it is easy to insert those entries in the financing sources by financing agents (FSx FA) table.

11.20. The Ministry of Health figures seem, at first glance, to be similarly easy. Thus far in the process, general revenue and donor funds have been identified as the source of Ministry of Health funds. Not all of the Ministry of Health spending is financing agent activity, however; the ministry has two grant entries in its books, one to regional governments and the other to the National Insurance Agency. The NHA rules say that in this type of general-purpose transfer, which appears with Ministry of Finance codes 7.10.00

and 7.11.00 (see Exhibit 10.7 on page 153), the regional government or National Insurance Agency should be the financing agent and the Ministry of Health should be the source (see paragraph 11.17). Accordingly, the team revises the T-account figure for the Ministry of Health total (Exhibit 11.1) and for its funding from general revenue (FS.1.1.1xHF.1.1.1.1) and shows those grants in cells for the regional government and the National Insurance Agency (FS.1.1.1xHF.1.1.2 and FS.1.1.1xHF.1.2). This results in Exhibit 11.2.

Exhibit 11.1

Appia: Ministry of Health consolidated health spending T-accounts (HF.1.1.1.1) (revised)
Calendar year 2002 (millions of crowns)

Expenditure			Revenue	
Gross spending		33 478	External organizations	1 538
Subtract out-of-scope spending (7.02.00)	**-1 600**			
Add back medical supplies (7.02.06)	**218**	**-1 382**	General revenue to balance	28 466
Less transfers (7.10.00)		-986		
Less transfers (7.11.00)		-1 106		
Total		**30 004**	**Total**	**30 004**

Source: Ministry of Finance, Materials on the Execution of the Federal and Consolidated Budgets.

Exhibit 11.2

Appia: financing sources by financing agents (FSxFA) table (in progress, 1)
Calendar year 2002 (millions of crowns)

Financing agents		Financing sources (FS)		
		FS.1.1	FS.3	
		Central government	Rest of the world funds	Total
HF.1.1.1.1	Ministry of Health	28 466 ~~30 558~~	1 538	30 004 ~~32 096~~
HF.1.1.1.2	Ministry of Education	329		329
HF.1.1.1.3	Ministry of Defence	635		635
HF.1.1.2	Regional government	986		
HF.1.2	National Insurance Agency	1 106		
Trial sum				
Estimated total				

11.21. Next, the team looks at the regional government account (see Exhibit 10.3 on page 149). Entering that row into the table, the team realizes that there are more central government funds coming into regional coffers than just the Ministry of Health grant. The Ministry of Health reimburses regional hospitals and polyclinics for services provided to unemployed people (Ministry of Finance budget codes 7.07.00

and 7.08.00). These funds appear to have been double counted — once with the Ministry of Health and once with the regional governments — and one set of entries must be eliminated. Unlike grants, the use of these funds is under the control of the Ministry of Health, and so it is appropriate for the Ministry of Health to be the financing agent. Thus, the money seemingly must be deducted from the regional government total in the T-account to eliminate the double counting. In the process of doing so, however, an anomaly appears: the Ministry of Finance figure for regional polyclinic expenditures (¢521 million) is lower than the amount of polyclinic services reimbursed by the Ministry of Health (¢6473 million). The team checks with Ministry of Finance staff and regional authorities and discovers that although hospital reimbursements go to the regional treasury, polyclinic reimbursements are kept by the individual facilities; thus the figure of ¢521 million represents only the regional government subsidy of these facilities. Therefore, only the Ministry of Health hospital reimbursement of ¢5299 million is truly double-entered. The team adjusts the T-account to reflect those payments, as shown in Exhibit 11.3. The new balancing entry is added in a new column (FS.1.1.2xHF.1.1.2) in Exhibit 11.4.

Exhibit 11.3

Appia: Regional government health spending (HF.1.1.2) (revised, 1)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
Hospital care	19 712	Ministry of Health grants (7.10)	986
Less Ministry of Health payments (7.07)	-5 299	Other revenue	14 730
Polyclinic care	521		
Public health	726		
Administration	56		
Total	**15 716**	**Total**	**15 716**

Source: Ministry of Finance, Materials on the Execution of the Federal and Consolidated Budgets.

Exhibit 11.4

Appia: financing sources by financing agents (FSxFA) table (in progress, 2)
Calendar year 2002 (millions of crowns)

Financing agents		Financing sources (FS)			
		FS.1.1.1	FS.1.1.2	FS.3	
		Central government	Regional government	Rest of the world funds	Total
HF.1.1.1.1	Ministry of Health	28 466		1 538	30 004
HF.1.1.1.2	Ministry of Education	329			329
HF.1.1.1.3	Ministry of Defence	635			635
HF.1.1.2	Regional government	986	14 730 ~~20 029~~		15 716 ~~21,015~~
HF.1.2	National Insurance Agency	1 106			
Trial sum					
Estimated total					

11.22. The team then enters the figures for the various types of health insurance (Exhibit 11.5, see page 164). Examining the financial report provided by the National Insurance Agency (see Exhibit 10.4 on page 149), they see that the revenue total they are using includes interest income. Because this interest income is used to help pay the benefits and administrative expenses of the Agency, it is appropriate to count it in national health expenditure. So the team opens another financing source, called "other" (FS.1.2), in addition to employers (FS.2.1) and households (FS.2.2). To allocate payroll taxes between employers and employees, the team relies upon the National Insurance Agency statute. This specifies that employers must pay three-quarters of the premium and employees must pay one-quarter.

11.23. The rules governing the Government Employees Health Fund (see Exhibit 10.6 on page 150) state that one-quarter of premiums are to be collected by the Ministry of Finance from employees, supplemented by the remaining three-quarters taken from general revenue and transferred to the Fund. Because the Steering Committee has decided to follow the SNA convention of treating the government employee health plan as private social insurance, the government contribution is included with FS.2.1.

11.24. For financing sources of private insurance companies, the team turns to survey results (Exhibit 9.1). Unfortunately, the insurance companies cannot distinguish between employer monies (FS.2.1) and employee monies (FS.2.2) in group policies, so for now a division is not possible. It is possible, however, to allocate all individual premiums to households (FS.2.2).

11.25. The team encounters difficulties entering the household data. The figures reported by the insurance companies do not seem to match those reported in the household survey. For the moment, the team enters the survey results, planning to return later to reconcile the different reports (Exhibit 11.6, see page 165).

11.26. The survey of nongovernmental organizations (see Exhibit 9.4 on page 136) shows that ¢1653 million came from funds from organizations outside of Appia (FS.3). Another ¢1235 million came from local philanthropy, which is classified in FS.2.3. A new row and new column are added to the FSxFA table (Exhibit 11.7, see page 166).

11.27. Next, the team looks at firms (see Exhibit 9.2 on page 132). The figure reported by AZap, the national electricity utility, is entered (FS.2.1xHF.2.5.1). The survey of private firms provides a second estimate of premiums paid to private insurance, which is entered in the table. Also, the employer survey provides an estimate of the employer/employee split of those premiums. Based on the survey, one-third of the estimated insurance premiums is entered as employers' funding of private insurance (FS.2.1xHF.2.1.2), and two-thirds is entered as household premiums (FS.2.2xHF.2.1.2). These are added to Exhibit 11.7 along with an entry that shows firms' spending in their own facilities (FS.2.1xHF.2.5.2).

11.28. For external organizations (see Exhibit 9.3 on page 135), the project run by Doctors without Borders is posted as direct spending (FS.3 x HF.3). The other projects involve grant activity and thus are not financing agent entries for HF.3. No other source funds external organizations acting as financing agents, but there is a total available from the census for these organizations as a financing source, so that figure is entered in the "estimated" column margin of Exhibit 11.7.

11.29. To start the reconciliation process, a trial sum is entered for each financing source. The only independent estimate of the money contributed by financing sources to Appia's health care is for rest of the world funds, so the estimated line is left blank except for that cell.

11.30. A conflict arises immediately between the trial sum for rest of the world funds (FS.3) and the estimated figure. In reviewing the figures in Exhibit 9.3, the team realizes that a grant had been given to a local government to subsidize a public health programme - a grant that escaped the Ministry of Finance budget consolidation. The team checks with external organizations and with local health departments to see whether anybody is aware of other such grants. None other are reported, and it appears that the Coastal Region government reported spending the funds, although they did not report receiving them. So the team adjusts the amount of local government tax revenue it had entered as a balancing item (Exhibit 11.8) and corrects the FSxFA table entries.

Exhibit 11.8

Appia: Regional government health spending (HF.1.1.2) (revised, 2)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
Hospital care	19 712	Ministry of Health grants (7.10)	986
Less Ministry of Health payments (7.07)	-5 299	External aid	300
Polyclinic care	521	Other revenue	14 430
Public health	726		
Administration	56		
Total	**15 716**	**Total**	**15 716**

Source: Ministry of Finance, Materials on the Execution of the Federal and Consolidated Budgets.

11.31. The team reviews those cells where there is more than one source of information. Employer premiums to private insurance companies is such a case. The team notes that the two estimates are not far apart – the employer survey has a point estimate of ¢2070 million and the private insurance survey has a point estimate of ¢2130 million for the total HF.2.1.1. Because the response rate to the private insurance survey is higher, the team elects to use the ¢2130 million figure. They note with satisfaction that ¢2130 million lies inside the 95% confidence interval of the employer survey – that is, the difference between the two is not statistically significant. The team uses the split of premiums between employers and employees from the firm survey to allocate the ¢2130 million between the two financing sources: one-third goes to employers and two-thirds to households. Also, because the two figures on group insurance premiums are so close, the team agrees that the point estimate for direct firm spending is probably the best available estimate, and so they use that figure.

11.32. For households as a financing source, the team agrees that the annual report of the National Insurance Agency and the private insurance survey are a better estimate of premiums paid by households than the household survey itself. The household survey reports a figure 20% lower than the National Insurance Agency figure on household premiums, which could be expected, as those premiums are deducted from payrolls. The figures on private insurance premiums are closer, because only part of those premiums are deducted from paychecks: the insurance survey figure of ¢3280 million for individual premiums, plus the estimated ¢1420 million in employee payment of group premiums adds up to ¢4700 million, compared to ¢4400 million from the household survey. If the same undercount applies to group premiums as to National Insurance Agency premiums, the two figures on individual premiums are not far apart. Thus the team decides — despite their use of the ¢4700 million figure — that this triangulation suggests that they should not adjust the remaining spending estimates from the household survey for a hypothetical undercount.

11.33. With these adjustments made, the FSxFA table now appears as Exhibit 11.9, (see page 167). The total financing source estimate for employers (¢50 435 million) and for households (¢106 045 million) is different from the figures generated by the respective surveys; the team has replaced weaker estimates with stronger ones.

11.34. With this provisional financing sources by financing agents (FSxFA) table in hand, the team is ready to move to the next stage of the estimation process – estimating the financing agents by providers FAxP table. This is the subject of the next chapter.

Exhibit 11.5 Appia: financing sources by financing agents (FSxFA) table (in progress, 3) Calendar year 2002 (millions of crowns)

Financing agents		Financing sources (FS)						
		FS.1.1.1 Central government	FS.1.1.2 Regional government	FS.1.2 Other public funds	FS.2.1 Employer funds	FS.2.2 Household funds	FS.3 Rest of the world funds	Total
HF.1.1.1.1	Ministry of Health	28 466					1 538	30 004
HF.1.1.1.2	Ministry of Education	329						329
HF.1.1.1.3	Ministry of Defence	635						635
HF.1.1.2	Regional government	986	14 730					15 716
HF.1.2	National Insurance Agency	1 106		566	44 374	14 791		60 837
HF.2.1.1	Government employees health insurance				422	141		563
HF.2.1.2	Private group insurance				2 130 (part)	2 130 (remainder)		2 130
HF.2.2	Private individual insurance					3 280		3 280
Trial sum								
Estimated total								

Exhibit 11.6 Appia: financing sources by financing agents (FSxFA) table (in progress, 4) Calendar year 2002 (millions of crowns)

Financing agents		Financing sources (FS)						
		FS.1.1.1 Central government	FS.1.1.2 Regional government	FS.1.2 Other public funds	FS.2.1 Employer funds	FS.2.2 Household funds	FS.3 Rest of the world funds	Total
HF.1.1.1.1	Ministry of Health	28 466					1 538	30 004
HF.1.1.1.2	Ministry of Education	329						329
HF.1.1.1.3	0inistry of Defence	635						635
HF.1.1.2	Regional government	986	14 730					15 716
HF.1.2	National Insurance Agency	1 106		566	44 374	14 791 0r 11 626±		60 837?
HF. 2.1.1	Goverment employees health insurance				422	141		563
HF.2.1.2	Private group insurance				2 130 (part)	2 130 (remainder) or part 4 400±		2 130?
HF.2.2	Private individual insurance					3 280 or part 4 400±		3 280?
HF.2.3	Households					86 413±		86 413±
Trial sum								
Estimated total								

Note: the symbol ± following a number indicates the figure has a confidence interval surrounding it.

Exhibit 11.7 Appia: financing sources by financing agents (FSxFA) table (in progress, 5) Calendar Year 2002 (millions of crowns)

Financing agents		Financing sources (FS)							
		FS.1.1.1 Central government	FS.1.1.2 Regional government	FS.1.2 Other public funds	FS.2.1 Employer funds	FS.2.2 Household funds	FS.2.3 Non governmental organizations	FS.3 Rest of the world funds	Total
HF.1.1.1.1	Ministry of Health	28 466						1 538	30 004
HF.1.1.1.2	Ministry of Education	329							329
HF.1.1.1.3	Ministry of Defence	635							635
HF.1.1.2	Regional government	986	14 730						15 716
HF.1.2	National Insurance Agency	1 106		566	44 374	14 791 or 11 626±			60 837
HF.2.1.1	Government employees health insurance				422	141			563
HF.2.1.2	Private group insurance				2 130 (part) or 690±	2 130 (remainder) or part 4 400± or 1 380±			2 130 or 2 070±
HF.2.2	Private individual insurance					3 280 or part 4 400±			3 280?
HF.2.3	Households					86 413±			86 413±
HF.2.4	Nongovernmental organizations						1 235	1 653	2 888
HF.2.5.1	Nationally owned electricity utility (AZap)				1 905				1 905
HF.2.5.2	Private firms				3 024±				3 024±
HF.3	External organizations							599	599
Trial sum		31 522	14 730	566	?	?	1 235	3 790	?
Estimated total								4 090	

Note: the symbol ± following a number indicates the figure has a confidence interval surrounding it.

Exhibit 11.9 Appia: financing sources by financing agents (FSxFA) table (preliminary) Calendar Year 2002 (millions of crowns)

Financing agents		Financing sources (FS)							
		FS.1.1.1 Central government	FS.1.1.2 Regional government	FS.1.2 Other public funds	FS.2.1 Employer funds	FS.2.2 Household funds	FS.2.3 Non governmental organizations	FS.3 Rest of the world funds	Total
HF.1.1.1.1	Ministry of Health	28 466						1 538	30 004
HF.1.1.1.2	Ministry of Education	329							329
HF.1.1.1.3	Ministry of Defence	635							635
HF.1.1.2	Regional government	986	14 430					300	15 716
HF.1.2	National Insurance Agency	1 106		566	44 374	14 791			60 837
HF.2.1.1	Government employees health insurance				422	141			563
HF.2.1.2	Private group insurance				710	1 420			2 130
HF.2.2	Private individual insurance					3 280			3 280
HF.2.3	Households					86 413			86 413
HF.2.4	Nongovernmental organizations						1 235	1 653	2 888
HF.2.5.1	National electricity utility (AZap)				1 905				1 905
HF.2.5.2	Private firms				3 024				3 024
HF.3	External organizations							599	599
Trial sum		31 522	14 430	566	50 435	106 045	1 235	4 090	208 323

Note: the symbol ± following a number indicates the figure has a confidence interval surrounding it.

Chapter 12

Estimating the financing agents by providers table

12.01. The process of creating a vector of financing agent spending and then using that vector as a starting place to create the financing sources by financing agents (FSxFA) table provides several opportunities to review the entities and amounts of spending included in the health accounts. The financing agent vector is also used as a starting place for creating the financing agents by providers (FAxP) table. In this process, particular expenditures may be added or removed. The development of this table will also help in the review and verification of the spending estimates developed while building the FSxFA table.

12.02. What complicates this step of the process is the same thing that complicates the FSxFA table - the overlap between the entities that produce and finance health care. For example, the Ministry of Health may own and operate hospitals, receiving revenues from households and from private insurance. At the same time, it may pay for care provided by non-MoH physicians and clinics. These dual roles can be very confusing, so care is needed in preparing this table to make sure that the row and column margins reflect the expenditure associated with entities' roles in the production and financing of health care, respectively.

Disaggregating each financing agent

Breaking down spending into provider types

12.03. The first step in this process is to break down each financing agent's expenditures by provider type. The list of provider types is the one developed according to Chapter 4, so before beginning this process it is useful to review that list and the distinctions made among the various types of providers. As noted in Chapter 4, analysts may wish to adapt the broad classifications of providers to national interests and conditions.

12.04. Mechanically, a FAxP table shell must be created as in Table 12.1. This shell should contain a column for each of the financing agents identified thus far (unconsolidated), plus columns for estimated total and trial sum, the use of which will be similar to that used to populate the FSxFA table (see Chapter 11). Each row corresponds to one of the provider types from the list developed in Chapter 4. There may be compelling reasons to assign a unique code to a provider that is large enough or special enough to warrant its own code; for example, if there is one large tertiary care hospital in the country, owned by the Ministry of Health, it could be assigned a code such as HP.1.1.1.1.9 (see paragraph 4.12).

Table 12.1 Financing agents by providers (FAxP) table (working outline)

Providers	Financing agents (FA)			Trial sum	Estimated Total
	FA 1	FA 2	etc.		
Provider type 1					
Provider type 2					
etc.					
Total					

12.05. Sometimes the disaggregation or breakdown of financing agent spending is straightforward. For example, the Ministry of Health may provide money directly to hospitals, polyclinics, and other known providers. Where the recipient of the funds is a distinct entity that is clearly distinguished by the provider taxonomy, the job is relatively easy. Breaking down spending still requires care, however, because it may be the case that some money transferred to providers is not actually used for health care — a fact that may be determined either from the financing agent or from the provider.

12.06. If budgetary breakdowns are not available for the financing agent, survey information may be of use. Sometimes this information comes from a review of a sample of records at the office of the financing agent. In other cases, sample data may be available from a class of providers showing the breakdown of their income by financing agent. In the case of household spending (discussed in Chapter 8), survey data probably exist showing expenditure by type of provider or establishment. If the data are shown by type of service received, it may be possible to translate that dimension of spending into the provider dimension (see Box 12.1).

Box 12.1
Building provider estimates from household and other data sources in Rwanda

At the time the Rwandan health accounts for 1998 were being prepared, the most recent household survey had been conducted in the 1980s and the most recent demographic health survey in 1992. During the year 2000, a household survey conducted by the Ministry of Planning/UNDP and a demographic health survey by ONAPO*/Macro International collected information on households' socioeconomic situation in Rwanda. Because of the lack of household expenditure data for 1998, amounts declared as revenue from households by insurance companies and service providers were used to approximate household spending for health care for the purposes of the national health accounts.

Because it was not known how much households spent on treatment received from traditional healers, the health accounts team assumed that about 25% of households used the services of traditional healers, spending as much on those services as they paid for care in health centres. The amount spent on traditional healers could be higher, given the observations by the staff of health centres that a large proportion of patients sought care at the health centre only after treatment by traditional healers failed to produce any improvement in the patient's health status. Almost all health spending by households went on out-of-pocket payments directly to providers; a negligible amount went to health insurance.

Source: Schneider P et al. 2000. *Rwanda national health accounts 1998*. Partnerships for Health Reform Working Paper, September 2000, pp. 52 and 77.

* Office National de la Population

12.07. Where there is no direct information on the breakdown of a financing agent's expenditure by type of provider, other estimation methods must be used. For example, consultation with expert staff of the financing agent can help to identify which types of providers are paid, and perhaps even a rank ordering of those providers in terms of expenditure amounts. A statement such as "our health insurance policies only cover physician services and a small amount of pharmaceuticals" can be of tremendous value in the absence of hard data on insurance plan benefits.

12.08. Proceeding through these steps, additional types or subtypes of entities that receive funds from the financing agents may be uncovered. For each of these, a decision is needed as to whether or not this entity is a provider of health care goods and services within the boundaries described in Chapter 3. If so, a second decision is needed as to whether this is a type of provider that requires its own category, as opposed to being a member of an existing category (see paragraph 12.37 for an example of this). If the entity does not provide health care goods or services, then the spending figure for the financing agent must be reduced accordingly, and the FSxFA table must be rebalanced.

12.09. If nothing is available at all to help disaggregate a financing agent's spending, there is no recourse but to categorize the expenditure as "not specified by kind (nsk)" in the provider dimension of the table. This should be a last resort, as putting spending in this category reduces the policy usefulness of the health accounts, and also makes them more difficult to reconcile (paragraphs 12.39 to 12.42 provide an example of how this can be avoided).

Accumulating provider revenue across financing agents

12.10. Once the process of breaking down financing agent spending into provider types has been completed, the spending for each provider type across all financing agents is summed. This sum is entered in the "trial sum" column for each provider type. Very often there will be a range of spending to enter at this point. That is not a problem, as the reconciliation process to follow will help to reduce that range to a single point.

Estimating provider revenues

12.11. Setting aside for the moment the work done using the financing agent material, the row totals in the financing agents by providers (FAxP) table should be estimated and those figures placed in the "estimated" column. This is done using the data sources identified in Chapter 9. In the case of providers of administrative services, there will not be an estimate separate from the financing agent figures, so that entry is left blank. Bearing in mind the discussion of data sources in Chapter 6, figures for some provider types are easier to estimate than for others, just as figures for some financing agents are easier to estimate than for others. Especially in looking at providers of care it may be possible to make use of work already done to build estimates of gross domestic product (see Annex C). The national statistical agency may have compiled an input/output table that could help as well.

12.12. Because national health accounts (NHA) are an aggregation of the transactions related to health care activity in a country, it is important to establish a reliable convention for placing a monetary value on those activities. Not only does this permit valid comparisons across activities in the accounts and across the years shown in the accounts, it also permits comparison of national health expenditure with other economic aggregates, such as gross domestic product. For this reason, it is essential to employ an internationally accepted definition of the term "expenditure", specifically that used in the system of national accounts. See paragraphs 2.63 to 2.79 and Chapter VI of the SNA93 manual for a more complete treatment of the concepts and definitions discussed in this section of the *Guide*.

Estimating the value of market provider activity

12.13. In the case of providers that operate in essentially an unsubsidized fashion, consideration of total revenues is a good starting point for estimating the health spending attributed to them. The figure for expenditure measures the value in monetary terms of consumption of the goods and services of interest. Where expenditure on health goods and services is being measured from market production and consumption, this may simply mean compiling information on the total amount of money paid for such goods or activities at the point of final consumption. For example, if unsubsidized private hospitals have gross revenues of 100 million national currency units (NCU) from the sale of services during the year of interest, this 100 million NCU is added to health expenditure. Because market producers must cover all their intermediate expenses, including capital goods used and the labour inputs of owners, the expenditure on final consumption reasonably represents an all-in value.

12.14. As mentioned above, work done on the country's national accounts may be very useful for these kinds of providers, as the concepts used in placing a value on their output is the same in health accounting as it is in national income accounting. Some providers may, however, engage in activities that fall outside the health boundary as well as those that lie inside the boundary; for example, community pharmacies may also sell non-health items. If possible, excluded activities should be separated from the ones to be included. This may be done through use of economic statistics such as business surveys, through an input/output model based on national accounts, or through consultation with knowledgeable industry sources.

Estimating the value of non-market provider activity

12.15. A great deal of health activity occurs partly or wholly outside the market. For example, governments, private employers, or non-profit institutions such as health care providers affiliated to religious bodies often produce health care services and provide them at no cost or at a subsidized cost to users. The transaction between providers and patients in these cases is unlikely to represent the full value of production, so health accounting follows the international convention of valuing non-market production as the sum of the costs incurred in the production of these goods or services. Hospital services provided free of charge (or nearly free of charge) in government institutions or institutions of non-profit organizations would be valued at the cost to those organizations of producing the services. Costs are typically calculated as the actual expenditure on inputs such as staff remuneration (including all benefits) and supplies. This may total more than the ministry budget figure: patients may pay user charges that are retained by the provider, or other organizations may make grants to the provider. The key figure in the valuation is the cost of providing the care, not the source of the money used to pay those costs.

12.16. Use of the resource cost classification schedule can help in establishing a value for non-market production (see Box 12.2). The categories help health accountants separate expenses that should be counted from those that should not be counted (such as transfers and subsidies). In cases where the provider records do not follow the resource cost classification neatly, it may be necessary to develop a crosswalk to help in the estimation process.

Box 12.2
Using income and expenditure reports to prepare health accounts estimates

There are a variety of formats used by providers to report income and expenses. Some items from these reports should be included in the total used in the health accounts, while others should be excluded. Below are examples of report formats and the appropriate treatment of the line items. Items that are excluded may be shown in a separate exhibit table.

General format of the statement of income and expenditure in hospitals and major health units

Line item	Treatment in health accounts
Sales/turnover	Exclude
Cost of sales	Include
Gross profit	Exclude
General administrative expenses	Include
Selling and distribution expenses	Include
Operating income (or profit)	Exclude
Investment income (net interest, dividend receivable)	Exclude
Other net incomes	Exclude
Taxes on profit	Include
Net income (or profit) on ordinary activities after taxation	Exclude
Extraordinary net income (or profit) after taxation	Exclude
Profit of the financial year	Exclude

Box 12.2 (continued)

Another format commonly used for the statement of income and expenditure in hospitals and major health units	
Line item	Treatment in health accounts
Incomes	Exclude
Sales/turnover	Exclude
Increase in stocks of finished goods and work in progress	Exclude
Work performed and capitalized for own use	Exclude
Other operating income	Exclude
Investment incomes (interest and dividend receivable)	Exclude
Extraordinary income	Exclude
Charges	Include
Reduction in stocks	Exclude
Raw materials and consumables	Include
Staff costs	Include
Other operating charges	Include
Interest payable	Include
Taxes on profit on ordinary activities	Include
Profit on ordinary activities after taxation	Exclude
Extraordinary charges	Include
Taxes on profit on extraordinary activities	Include
Profit for the financial year	Exclude

12.17. Full accounting of the costs of production for non-market producers requires that NHA analysts also estimate the value of fixed capital consumed in production during the period of analysis (discussed below). This must be counted even though the expenditure to purchase this fixed capital may have taken place in a previous period.

12.18. As mentioned, this discussion of valuing non-market production implies that in some cases the estimated expenditures of government producers (such as Ministry of Health clinics) will not be the same as the figures recorded in the ministry budgetary documents. Expenditure on Ministry of Health facilities may include both household payments as user charges and estimated consumption of fixed capital (such as depreciation on government hospital buildings and equipment) in addition to the budgetary expenditures of the ministry on salaries, supplies, and other inputs. It may also include goods and services (such as free electricity) provided to those facilities by other ministries.

Valuing capital created and consumed

12.19. Investment in health care facilities and equipment creates assets that typically are used over a long period of time. Health accountants need to be sure that the value of that use is included in the estimated costs of non-market producers. Two distinct aspects of capital must be considered in measurement of health expenditure: gross fixed capital formation and the consumption of fixed capital (see Section H.1, paragraphs 1.48 to 1.57, in the SNA93).

12.20. The health accounts should include an estimate of the total expenditure on gross fixed capital formation during the period. This includes items such as new building construction or major renovations, or purchases of large equipment. Expenditure on capital formation should be estimated for all institutions and activities within the expenditure boundary, i.e. both government and non-government entities.

12.21. Consumption of fixed capital refers to the value of the capital assets used up for production during the current period. Typically, both market and non-market producers will use (or "wear down") some of the value of fixed capital in producing goods and services during the current period. For market producers, this is assumed to be captured in the prices charged at the time of consumption of their goods and services, and so is already captured in the estimates of the value of their production. For non-market producers, however, the value of consumption of fixed capital must be added to other components of their cost of production, such as compensation of employees and the cost of goods and services used in production. This may require special attention by the health accountant. Many government agencies do not calculate an estimate of capital consumption, or do not budget for that, as money does not change hands in this activity. Where it is not included, the health accountant should estimate an appropriate value for this item and add it to the production costs that do involve exchange of money. National income accountants have methods for estimating this economic cost, and health accountants should follow the same practices (see paragraphs 1.62 and 1.63 and Chapter 6.I of the SNA93).[19]

Household production of health care

12.22. As mentioned in paragraph 3.06, unpaid family care is not considered to be part of national health expenditure. Households and families provide a lot of inputs to health care, through their uncompensated time and effort. For example, family members take time to care for the sick at home or to stay with them in hospital. In keeping with the current practice in the system of national accounts, the value of such uncompensated activities and non-monetary inputs are not counted as health expenditure in NHA. These inputs may be very significant, as in the case of home-based care for people living with HIV/AIDS. The value of these activities can be estimated, but it is not part of the total used for comparison of health expenditure with other economic aggregates or for international comparison of health spending.

Treatment of loans and subsidies to providers

12.23. As is the case for financing agents, new loans received by providers and loan repayments made by them are excluded from the value of goods and services they deliver. In cases where market or quasi-market prices are in effect, this restriction is not a problem. In cases where the value of the provider's activity is estimated by adding together the values of inputs used, care must be taken to exclude any changes in financial assets that might appear in the provider's records; usually this is not a problem because accounting principles call for the separation of balance sheet items from income and expense items. It is appropriate to include interest payments made on debt incurred in the course of health-related activity; again, most accounting systems will show these figures among income and expense items. This treatment of loans and loan repayments is the same as that for financing agents.

[19] In practice, this is difficult to estimate initially, and may require more than one cycle of NHA estimation to value adequately.

12.24. Subsidies are handled in a slightly different manner for market and non-market producers. Because the value of market producers' activity is measured by their revenues, it is appropriate to include subsidies — they are a form of revenue. In contrast, the value of non-market producers' activity is measured by adding up their expenses; subsidies are a revenue and therefore do not enter the calculation (see Box 12.3).

Box 12.3
Handling provider subsidies in the health accounts

The key to correct treatment of subsidies in the health accounts is understanding of how production is being valued.

In the case of market (for-profit) providers, the value of goods and services they produce is equal to the revenue they receive. In the case of non-market (non-profit or government) providers, it is equal to the cost of production.

Because subsidies are a form of revenue, it is appropriate to count that amount when looking at market providers, but it is not appropriate to do so in the case of non-market providers. A simple income and expense account may help to clarify this point:

Market Provider

Expense		Income	
Labour	100	Receipts from insurance	90
Supplies	30	Receipts from households	60
Other expenses	10	Subsidies from government	10
Surplus	20		
Total expenses	**160**	**Total revenues**	**160**

In this example, the total value of goods and services produced is equal to 90+60+10=160 national currency units (NCU). Even though the government subsidies contributed to a surplus on the part of the provider, it is appropriate to include the subsidy as a form of revenue.

Box 12.3 (continued)

Non-market Provider			
Expense		Income	
Labour	200	Receipts from insurance	100
Supplies	60	Receipts from households	10
Other expenses	20	Subsidies from government	275
Surplus	5		
Total expenses	**285**	**Total revenues**	**285**

In the case of the non-market producer, the value of production is equal to 200+60+20=280 NCU (the 5 NCU surplus is not counted). Adding the government subsidies in with these expenses would mingle revenues and expenses and overstate the value of production.

If the expense side of the non-market provider is not known and those expenses are being approximated by the sum of the revenues the provider received, then it would be appropriate to include subsidies in the amounts being summed. Here subsidies are included not for a theoretical reason, but simply as part of an aid to estimating the expenses of the provider.

Reconciling differences between estimates based on financing agents and on providers

12.25. The next step is to compare the independent estimate of provider spending with the trial sum obtained from summing the spending of financing agents. It is very unlikely that the two will match, but do they come close? As discussed in Box 11.1 on page 157, "close" is a subjective term, probably best defined in terms of the effect upon the overall estimate of health spending. If using one figure as opposed to the other would change the total for national health expenditure by, say, 2%, an effort should be made to reconcile the two numbers.

12.26. Can the difference between the two be explained, for example, by the absence of data from one or more financing agents, or by potential survey biases? If so, adjustments can be made to the "weaker" figure to bring the estimates into closer alignment.

12.27. Large unexplained differences require a re-examination of the estimates. The definitions should be reviewed, both for the provider figure and for the financing agent figure. Do they conform to the boundaries described in Chapter 3? Are they measuring the same thing? Are they measured for the same time period? Is one a cash figure and the other an accrual figure?

12.28. Where there is no total for independent providers, it may be useful to compare the provisional total with that for other providers and assess whether the relative spending figures are plausible. For example, is the order of magnitude between spending on traditional healers and spending on "mainstream" providers consistent with evidence from other sources?

Identifying gaps and missing cells

12.29. Next, with both the row and column totals in mind, cells should be examined where there is more than one estimate. For example, if a survey of physicians suggests that one-third of their revenue comes from voluntary medical insurance (private insurance), is that borne out by a comparison of the private insurance estimate of physician benefits with the row total for physician services? If not, the data sources should be rechecked, and then a figure chosen that balances the strengths and weaknesses of the different estimates.

12.30. Next, cell entries believed to be weak should be examined — cells where there is a large margin of error (either explicit or implicit). These include cells where the financing agent total itself is weak or unknown, or where the financing agent spending could not be broken down by provider type. Is there now more information that can be used to estimate the cell? For example, anecdotal evidence about relative spending by two financing agents can be used to estimate one — or even both — financing agent cells in the row. This anecdotal evidence could come from discussions with experts about the provider type, or from academic work, or other sources. If spending had been assigned earlier to the unknown provider classification (HP.nsk), some of it can be "retrieved" to fill in missing amounts or to supplement the existing estimate, if such a move seems plausible (an assumption that should be checked through consultation with the financing agent).

Reconciling estimates

12.31. The process outlined above will lead to an iterative review of figures for financing agents and providers. At the conclusion of those iterations, the table's rows and columns will sum to an estimate of national health expenditure. As a result of the process, there may have been modifications of the original estimates of spending by the various financing agents.

12.32. Upon first reading, this process may seem confusing. The Appia NHA example that follows may help to make the process more concrete.

Estimating the financing agents by providers table for Appia

12.33. The Appian NHA team has constructed a provisional financing sources by financing agents (FSxFA) table and turns its attention to the financing agents by providers (FAxP) table. Exhibits in Chapters 9, 10, and 11 display the data the team has at its disposal.

12.34. Working with its Steering Committee, the team has already gone through Chapter 4 and developed a preliminary list of HP codes that are to be used. One deviation from Chapter 4 has been agreed to: policy-makers are not interested in the specific types of polyclinics in the country, but they are keenly interested in the ownership of those clinics. Therefore, the team has assigned HP.3.4.1 to government-owned polyclinics, and HP.3.4.2 to privately owned polyclinics.

Disaggregating financing agent payments

12.35. The team starts by looking at the Ministry of Health budget report (see Exhibit 10.7 on page 153). Ministry of Finance code 7.01.00 can be assigned straightforwardly to HP.1.1.1.1. Ministry of Finance code 7.02.06 (medical supplies used in orphanages) is assigned to "other residential care facilities" (HP.2.9). To allocate Ministry of Finance code 7.03.00 ("regulation of the pharmaceutical industry") the team consults

the OECD SHA manual. In Chapter 10, the manual clearly states that this activity falls into category HP.6.1. The assignment of code 7.04.00 to HP.5 is straightforward, but the assignment of code 7.06.00 ("miscellaneous health-related activities") is not clear. The team member liaising with the budget staff of the Ministry of Health has a conversation with them, in which it is learned that these expenditures are for the Ministry of Health's activities in public health liaison and coordination with regional governments, as well as for the family planning project funded by external donors. So the team classifies the spending with other public health activities by the ministry (HP.5). Ministry of Finance code 7.07.00 is assigned to HP.1.1.1.2, and code 7.08.00 is assigned to HP.3.4.1. Codes 7.10.00 and 7.11.00 are not assigned a HP crosswalk because they are grants to other financing agents. Finally, 7.12.00 is assigned to HP.6.1. The results of this exercise can be seen in Exhibit 12.1.

Exhibit 12.1

Appia: allocation of Ministry of Health budget (see Exhibit 10.7 on page 153) to HP classes in the Appia national health accounts

Ministry of Finance code	HP class
7.01.00	HP.1.1.1.1
7.02.06	HP.2.9
7.03.00	HP.6.1
7.04.00	HP.5
7.06.00	HP.5
7.07.00	HP.1.1.1.2
7.08.00	HP.3.4.1
7.10.00	---
7.11.00	---
7.12.00	HP.6.1

12.36. A quick check of the Ministry of Education and Ministry of Defence budget reports confirms the split of those ministries' spending among provider types (as seen in Exhibit 10.2 on page 148), and the Ministry of Finance budget report on regional government spending does the same for those governments' spending.

12.37. The National Insurance Agency annual report only lists aggregate benefits, with no detail. The Agency representative to the NHA Steering Committee asks his staff to prepare a more detailed breakdown of expenditures, providing the staff with the list of providers the NHA team had prepared based on Chapter 4. Reporting back (see Exhibit 12.2), the Agency staff observe that the Agency paid ¢471 million for the services of visiting nurses and there does not seem to be any place to record this in the NHA. As a result, the NHA team opens a new class of providers — visiting nurses — with a code of HP.3.3.

Exhibit 12.2

Appia: National Insurance Agency consolidated statement of expenditure Calendar year 2002 (millions of crowns)			
Provider types reimbursed			**54 319**
HP.1.1.1.1	Ministry of Health hospitals	6 740	
HP.1.1.1.2	Regional hospitals	14 062	
HP.1.1.2	Private hospitals	10 898	
HP.3.4	Government polyclinics	17 175	
HP.3.4	Private polyclinics	4 973	
	Visiting nurses	471	
Administration costs			6 518
Total incurred spending			**60 837**

Note: figures are on an incurred basis
Source: NIA staff report from special Steering Committee request.

12.38. Completing the government financing agents, the FAxP table reaches the stage shown in Exhibit 12.3.

Exhibit 12.3 Appia: financing agents by providers (FAxP) table (in progress, 1)
Calendar year 2002 (millions of crowns)

Providers		Financing agents (FA)				
		HF.1.1.1.1 Ministry of Health	HF.1.1.1.2 Ministry of Education	HF.1.1.1.3 Ministry of Defence	HF.1.1.2 Regional	HF.1.2 National Isurance Agency
HP.1.1.1.1	Ministry of Health general hospitals	9 387				6 740
HP.1.1.1.2	Ministry of Defence hospitals			116		
HP.1.1.1.3	Regional general hospitals	5 299			14 413	14 062
HP.1.1.2	Private general hospitals					10 898
HP.2.9	Other residential care	218				
HP.3.3	Visiting nurses					471
HP.3.4.1	Government polyclinics	6 473		519	521	17 175
HP.3.4.2	Private polyclinics					4 973
HP.4.1	Pharmacies					
HP.5	Public health providers	5 262			726	
HP.6.1	Government administrators	3 365			56	
HP.6.2	National Insurance Agency administrators					6 518
HP.8.1	Researchers		286			
HP.8.2	Educators		43			
Total		**30 004**	**329**	**635**	**15 716**	**60 837**

12.39. The annual statement from the Appian Government Employees Health Fund (see Exhibit 10.6 on page 150) provides all the information the team needs to allocate that spending, but the private insurance survey presents two problems (see Exhibit 9.1 on page 130). First, more than half of the benefit figure consists of payments made to the premium holder and the service is not indicated. The team had thought that this would be a small figure, but its size is going to complicate the table work. Second, there is no split between benefits paid under social (group) insurance and those under other (individual) insurance.

12.40. To develop the necessary estimates for the private insurance industry expenditure, a visit is arranged to the three largest private insurance companies in the country. In a review of a sample of claims, it is discovered that these payments were, indeed, made to the premium holder, but that they were almost exclusively for private physician services — virtually the only service covered besides hospital and polyclinic care. Now the team knows how to classify this spending, but they have another problem: was this spending reported in the household survey too? If so, the spending could be double counted, first when the household made the expenditure and then when the private insurance paid back the household. The team meets with the Appia Statistical Agency (ASA) and learns that the household budget survey questionnaire does not check for reimbursements made by insurance. The ASA agrees to do a small cognitive test of their instrument to see whether respondents will change their answers when asked about insurance reimbursements, and in the meantime the NHA team and the ASA statisticians agree that the best approach is to assume that the households reported spending that was later reimbursed. This means that the household spending figure for physician services will need to be reduced (see Exhibit 12.4).

Exhibit 12.4

Appia: households worksheet (HF.2.3) (revised, 1)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
Co-payments at hospitals	13 643	Own resources	83 773
Co-payments at polyclinics	11 965		
Purchase of prescription drugs	41 042		
Payments to other health practitioners	17 123		
	~~19 763~~		
Total (point estimate)	**83 773**	**Total**	**83 773**
Confidence interval: 79 584–87 962			

Source: Special tabulation from Appia Statistical Agency, 28 April 2003;
adjusted for reimbursements from private insurance.

12.41. Splitting benefits between the two types of insurance is more difficult. Because the insurance companies' record systems do not distinguish among policy types, consulting claims data directly does not help. The NHA team decides that for this cycle of the health accounts, they will assume that benefits are split between the group and individual lines of business in the same proportion as premiums are split between the two lines. In insurance terms, they assume that the two lines of business have the same "loss ratio", that is, the same ratio of benefits to premiums. This means that 39% of benefits is allocated to HF.2.1.2 and 61% is allocated to HF.2.2 (see Exhibit 12.5).

Exhibit 12.5 Appia: private insurance worksheet
Calendar year 2002 (millions of crowns)

Expenditure item	HP code	Line of business		
		Total	Group	Individual
a. Premiums		5 410	2 130	3 280
Proportion of total		100%	39%	61%
b. Benefits paid to:		4 436	1 730	2 706
Private for-profit hospitals	HP.1.1.2	123	48	75
Other for-profit facilities	HP.3.4.2	216	84	132
Private non-profit hospitals	HP.1.1.2	437	170	267
Other non-profit facilities	HP.3.4.2	1 020	398	622
Physicians	HP.3.1	2 640	1 030	1 610
Other	HP.nsk	0	0	0
c. Net cost of insurance (a-b)	HP.6.3 (group) HP.6.4 (individual)	974	400	574

12.42. This still does not help the team with the breakdown of benefits by provider type. However, insurance industry experts say that the benefits package is the same for group and individual policies, so the team allocates each benefit type line from the survey between group and individual categories proportionate to total benefits. They document this entire process, and note the changes that should be made to the survey in the next year to ask specifically about physician spending. They also note that a panel of industry experts should be convened to discuss whether the assumption of equal loss ratios across the two lines is valid (or whether some other assumption should be used).

12.43. The team finds the survey of employers to be straightforward enough, but a problem arises with AZap, the country's national electricity utility. A telephone conversation earlier had identified ¢1905 million in health spending by AZap (see Exhibit 10.5 on page 150). However, a follow-up call reveals that of the ¢1905 million, ¢636 million was actually taxes paid to the National Insurance Agency. Of the remainder, almost all was for AZap's polyclinic, but ¢53 million was reimbursed to employees for physician services they used outside the clinic. So, the parastatal total must be reduced to ¢1269 million (Exhibit 12.6), and – as with the private insurance payments to households — ¢53 million must be deducted from the household budget survey estimate of physician payments (Exhibit 12.7).

Exhibit 12.6

Appia: health spending by the nationally owned electricity utility, AZap (HF.2.1.1)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
AZap clinics	1 216	Internal resources	1 269
~~NIA premiums~~	~~636~~		
Reimbursements to employees	53		
Total	**1 269**	**Total**	**1 269**

Sources: Telephone call to Ms Pilar (analyst in AZap comptroller's office) 25 February 2003. Follow-up call to Mr Navril (comptroller's office) 16 March 2003.

Exhibit 12.7

Appia: households worksheet (HF.2.3) (revised, 2)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
Co-payments at hospitals	13 643	Own resources	83 720
Co-payments at polyclinics	11 965		
Purchase of prescription drugs	41 042		
Payments to other health practitioners	17 070		
	~~17 123~~		
Total (point estimate)	**83 720**	**Total**	**83 720**
Confidence interval: 79 534–87 906			

Source: Special tabulation from Appia Statistical Agency (Household Budget Division), dated 28 April 2003; adjusted for reimbursements from private insurance and from the nationally owned electricity utility, AZap.

12.44. The team encounters no problems disaggregating nongovernmental and external organization spending (as financing agents) into provider types, as the programmes are quite clear. Household spending is also added to the table, with the reductions discussed above. There is not sufficient information at this point, however, to separate many components of household spending among specific provider types, so the team marks the table accordingly.

12.45. At this point, the financing agents by provider (FAxP) table has been built up to Exhibit 12.8 (see page 190) based on information from financing agents.

Estimating spending by provider type

12.46. Now the team turns its attention to independent estimates of spending for provider services. In the case of Ministry of Health and Ministry of Defence hospitals (HP.1.1.1.1 and HP.1.1.1.2), Appia is fortunate to have cost reports from each facility. The Ministry of Defence cost reports confirm discussions with ministry staff that the only revenue these hospitals receive is the budget allocation.

12.47. The Ministry of Health reports (summarized in Exhibit 12.9), however, reveal an error in the health accounts developed so far. They confirm the total spending figure of ¢9387 million, but show that ¢6740 million in benefit payments were received from the National Insurance Agency and that ¢107 million in co-payments were received from patients. These payments were remitted to the general treasury, but the Ministry of Finance budget scheme does not show them in the Ministry of Health section of the budget. Following the rule that these payments should be attributed to the National Insurance Agency and to patients as financing agents (see paragraph 10.15), the team has to revise their original measurement of the Ministry of Health as a financing agent. The allocation of general revenue to hospitals must be revised down from ¢9387 million to ¢2540 million to avoid double counting the National Insurance Agency and patient payments.

Exhibit 12.9

Appia: Ministry of Health hospitals, consolidated income and expenditure
Calendar year 2002 (millions of crowns)

Expenditure			Revenue		
7.01.01	Wages	1 963	Collections from National Insurance Agency		6 740
7.01.02	Social contributions	818	Collections from patients		107
7.01.06	Drugs	981	Central government funds:		
7.01.08	Other supplies	40	Budget allocation	9 387	
7.01.03, .04	Services	1 268	Less remittances to Ministry of Finance	-6 847	2 540
7.01.10, .11	Other current expenditure	2 127			
7.01.05	Food	573			
7.01.09	Buildings	717			
7.01.07	Capital equipment	900			
Total		**9 387**	**Total**		**9 387**

12.48. From the regional authorities, actual budget figures are acquired for regional hospitals (HP.1.1.1.3), although with less detailed input information, and are compiled in Exhibit 12.10. Like Ministry of Health hospitals, these facilities received payments from patients and from the National Insurance Agency, and also from the Government Employees Health Fund. The Ministry of Finance accounting system did not identify these payments. Therefore, regional government payments (as financing agent) to its hospitals must be reduced from ¢19 712 million to ¢41 million in order to avoid double counting other payments by financing agents.

Exhibit 12.10

Appia: Ministry of Health hospitals, consolidated income and expenditure
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
Labour	11 826	Collections from National Insurance Agency	14 062
Drugs	1 969	Collections from patients	201
Other supplies	3 942	Collections from Ministry of Health	5 299
Services	986	Collections from Government Employees Health Insurance Programme	109
Other current expenditure	989	Subsidy from regional government budget	41
Capital	0		
Total	**19 712**	**Total**	**19 712**

12.49. From the private hospital association, the team acquires actual figures for those facilities (see Exhibit 12.11). These records also document household co-payments of ¢14 106 million. The team enters the total figures in the column labelled "estimated" and also shows the co-payment figures in the household cells.

Exhibit 12.11

Appia: private hospitals, consolidated income and expenditure (HP.1.1.2)
Calendar year 2002 (millions of crowns)

Expenditure		Revenue	
Current costs	25 827	Collections from National Insurance Agency	10 898
Capital costs	0	Collections from insurance	560
		Nongovernmental organization contributions	263
		Collections from patients	14 106
Total	**25 827**	**Total**	**25 827**

Source: Appian Hospital Association.

12.50. For estimates of expenditures in physicians' offices and in private polyclinics, the team turns to the country's national product accounts. The SNA staff provide estimates of ¢14 551 million for the former and ¢19 192 million for the latter (which includes the AZap clinic). The NHA team visits the SNA staff office to learn more about how these estimates were constructed and is satisfied with the explanation. The SNA staff are, however, unable to help with estimates of spending for visiting nurse services and for traditional practitioners. Visiting nurses comprise too small a category to be estimated separately for the income and product accounts, and traditional healers are considered to be outside the economy — transactions between them and households are considered to be transfers and are not tracked.

12.51. For estimates of spending at government polyclinics, the team consults the consolidated regional government budget produced by the Ministry of Finance. The figure of ¢521 million for spending seems suspiciously low; upon investigation, the team discovers that regional polyclinics (unlike their hospital counterparts) are allowed to keep the revenues received from other payers, and only the regional government subsidy is carried in the Ministry of Finance report. This means there is no independent source of total spending by regional governments on polyclinics. The Ministry of Defence polyclinics are financed entirely through the ministry's budget, so that figure seems fairly secure.

12.52. After this preliminary breakdown of health spending by various financing agents and a preliminary estimate of some of the row margins, the team has the financing agents by providers (FAxP) table shown in Exhibit 12.12 (see page 191).

Reconciling the entries

12.53. The team starts a reconciliation process. First, it looks at the household co-payment estimates for hospital care. It notes that the figure reported by government and private hospitals combined (¢107 million + ¢201 million + ¢14 106 million = ¢14 414 million) is only slightly higher than the ¢13 643 million reported in the household survey. The team decides that this is not surprising, as inpatient events are more easily recalled than other types of medical events. It is heartening to note that the sum reported by the hospitals falls inside the 95% confidence interval supplied by the Appia Statistical Agency. Reviewing the reporting from the hospitals, the team concludes that these figures are more solid than the point estimate from the household survey and, deferring the weaker estimate to the stronger, it replaces the household survey figures for co-payment with those from the hospital reports.

12.54. Next, the team looks at spending for outpatient services. There are two challenges here. First, there is no total estimate for government polyclinics. Second, there is no split of household spending between government polyclinics and private polyclinics. The team deals with the first problem by looking at known payments to government polyclinics. It notes that the National Insurance Agency paid ¢17 175 million to the clinics, and that the Agency's regulations require patients to pay 5% of the polyclinic bill. Thus, it assumes that the household co-payments are 0.05x(¢17 175 million /0.95), or ¢904 million. Adding to this figure the other known payments, the team arrives at a total spending figure for government polyclinics of ¢25 994 million (see Exhibit 12.13).

Exhibit 12.13 Appia: outpatients worksheet
Calendar year 2002 (millions of crowns)

Government polyclinics	
National Insurance Agency payments	17 175
Ministry of Health payments	6 473
Government insurance payments	402
Regional government funds	521
Household payments (estimated)	904
Ministry of Defence polyclinics	519
Equals: total (estimated)	25 994

Exhibit 12.13 Appia: outpatient worksheet (continued)
Calendar year 2002 (millions of crowns)

Private polyclinics	19 192
Less: private insurance payments	-1 236
National Insurance Agency payments	-4 973
Nationally owned electricity utility (AZap) polyclinic	-1 216
Equals: household and private firms' payments	11 767
Less: private firms' payments	-3 024
Equals: household payments to private polyclinics	8 743
Plus: household payments to government polyclinics	904
Equals: household payments to polyclinics	9 647

12.55. To solve the second problem, the team begins with the SNA estimate of total spending at private clinics. It subtracts the figures from the National Insurance Agency, private insurance companies, and the national electricity utility (AZap), and it is left with ¢11 767 million to split between households and employers. Although the household and employer estimates already in hand each have 5% margins of error, the team decides to use the point estimate for employers as reported. This minimizes the number of changes made to existing data, and does little violence to the distribution of spending for polyclinic services among the various financing agents. Doing so makes the household figure ¢9 647 million for government and private polyclinics combined, which is about 20% lower than the point estimate reported from the household survey. The team debates this figure: should an adjustment be made to the other items in the calculation? Reducing the employer payment figure would result in a household amount only slightly higher as a percentage of the survey amount, so making that adjustment would not resolve the discrepancy. Raising the total amount for private polyclinics from the SNA figure is another option, but to do so would invite more questions about the estimates than are warranted by the strength of those estimates. The team decides to use its derived figure but to watch the household survey figure in future cycles of the health accounts — if the worksheet the team has created consistently understates the survey figure it will need to engage in more exploration of this part of the accounts, and if the difference between the two figures fluctuates from year to year the discrepancy may simply signal the presence of sampling error.

12.56. Now the team looks at physician services, creating a worksheet similar to that used for private polyclinics (Exhibit 12.14). Again starting with the SNA figure for total spending on physician services and subtracting benefit figures from the private insurance survey, the parastatal report, and the nongovernmental organization survey, they arrive at household spending of ¢11 572 million as the remainder. The figure for spending by Doctors without Borders is not subtracted from the SNA figure because the programme does not operate offices that could be captured in a survey and is most likely to be recorded in the SNA with social welfare organizations. This raises the NHA figure for total spending on physician services above that reported in the SNA, but the difference can be explained on classification grounds.

Exhibit 12.14 Appia: private physicians worksheet
Calendar year 2002 (millions of crowns)

SNA estimate	14 551
Less: private insurance payments	-2 640
Nongovernmental organization payments	-286
Nationally owned electricity utility (AZap) payments	-53
Equals: Household payments (estimated)	11 572

12.57. Establishing a household payment figure for physicians helps to solidify the figures for traditional healers (Exhibit 12.15). The household survey was unable to distinguish between these services and physician services, providing a total spending of ¢19 763 million. Subtracting ¢2 640 million from that for payments reimbursed by private insurance and another ¢53 million for payments reimbursed by the national electricity utility, AZap, eliminates the double counting described earlier. Subtracting the estimate of ¢11 572 million for physician services derived above, the team is left with ¢5498 million for traditional healer services.

Exhibit 12.15 Appia: traditional healers worksheet
Calendar year 2002 (millions of crowns)

Survey estimate of household payments to providers	19 763
Less: reimbursements to households (eliminate double counting)	-2 693
Private insurance payments	2 640
Nationally owned electricity utility (AZap) payments	53
Less: household payments to doctors	-11 572
Equals: household payments to traditional healers	5 498

12.58. This figure is almost certainly too low. First, the household survey is likely to underestimate spending for practitioner services (including physicians), because of recall errors (see paragraph 8.25). Second, respondents may be unwilling to report payments to traditional healers for fear of seeming "backward". Third, using this "remainder method" means that possible errors in reporting of private insurance payments and possible errors in estimating the total physician category all fall into the cell for household spending on traditional healers — although the team does not know whether this net error will be positive or negative.

12.59. Unfortunately, there is no easy remedy for this problem. In the absence of a good estimate of the size of the traditional healer "market" and without good evidence of the extent of underreporting in the household budget survey, the team decides to let this estimate stand. With these numbers, household spending for traditional healers is about half that for physician services, which is in the range of anecdotal evidence. The team documents the problem thoroughly, and resolves to work on achieving better estimates in future estimation cycles.

12.60. The same type of situation exists for prescription drug spending. At present, pharmaceuticals are combined with other consumer products in the SNA figures, so that these accounts do not provide any

help. SNA staff are still building the input/output table and are not yet able to provide figures on the prescription drug market. Recognizing that the timeliness of their report is very important, the NHA team decides to use the household survey figure as reported, and to work on obtaining better estimates in following cycles (perhaps building its own model of pharmaceutical sales). Because no other financing agent has reported making payments to community pharmacies, the household figure is also used as the provider total for this line.

12.61. With a few more calculations, the NHA team has a financing agents by providers (FAxP) table in hand. There are no estimates of public health activity, administration, research, or education independent of the figures reported by the various financing agents, so the "provider" totals are simply summed from the cell entries. In the same way, the net cost of group and individual insurance is calculated from the insurance worksheet and there is no independent estimate of this value. The FAxP table at this point appears as shown in Exhibit 12.16 (see page 192). The estimated national health expenditure is now ¢182 228 million, compared to the figure of ¢208 323 million derived in the first pass through the financing sources by financing agents (FSxFA) table.

12.62. As a result, the team returns to the FSxFA table to reflect the new figures on household spending and AZap's spending for health. The new table — still provisional — appears as in Exhibit 12.17 (see page 193). The team turns its attention to estimation of the financing agents by functions (FAxF) and providers by functions (PxF) tables, the subject of the next chapter.

Exhibit 12.8 Appia: financing agents by providers (FAxP) trial table Calendar Year 2002 (millions of crowns)

Providers	Financing agents (FA)												
	HF.1.1.1.1 Ministry of Health	HF.1.1.1.2 Ministry of Education	HF.1.1.1.3 Ministry of Defence	HF.1.1.2 Regional Government	HF.1.2 National Insurance Agency	HF.2.1.1 Government group insurance	HF.2.1.2 Private group insurance	HF.2.2 Private individual insurance	HF.2.3 Households	HF.2.4 Nongovernmental organizations	HF.2.5.1 Nationally owned electricity utility, AZap	HF.2.5.2 Private firms	HF.3 Rest of the world
HP.1.1.1.1 Ministry of Health general hospitals	9 387				6 740				part 13 643				
HP.1.1.1.2 Ministry of Defence hospitals			116										
HP.1.1.1.3 Regional general hospitals	5 299			14 413	14 062	109			part 13 643				
HP.1.1.2 Private general hospitals					10 898		218	342	part 13 643	263			
HP.2.9 Other residential care	218												
HP.3.1 Offices of physicians							1 030	1 610	part 17 070	286	53		599
HP.3.3 Visiting nurses					471				part 17 070				
HP.3.4.1 Government polyclinics	6 473		519	521	17 175	402			part 11 965				
HP.3.4.2 Private polyclinics					4 973		482	754	part 11 965		1 216	3 024	
HP.3.9.9 Traditional healers									part 17 070				
HP.4.1 Pharmacies									41 042				
HP.5 Public health providers	5 262			726						1 893			
HP.6.1 Government administrators	3 365			56									
HP.6.2 National Insurance Agency administrators					6 518								
HP.6.3 Insurance administrators (group)						52	400						
HP.6.4 Insurance administrators (other)								574					
HP.6.9 Other administrators										216			
HP.8.1 Researchers		286								230			
HP.8.2 Educators		43											
Total	**30 004**	**329**	**635**	**15 716**	**60 837**	**563**	**2 130**	**3 280**	**83 720**	**2 888**	**1 269**	**3 024**	**599**

Exhibit 12.12 Appia: financing agents by providers (FAxP) table (in progress, 2) Calendar Year 2002 (millions of crowns)

Providers	Financing agents (FA)														
	HF.1.1.1.1 Ministry of Health	HF.1.1.1.2 Ministry of Education	HF.1.1.1.3 Ministry of Defence	HF.1.1.2 Regional Government	HF.1.2 National Insurance Agency	HF.2.1.1 Government group insurance	HF.2.1.2 Private group insurance	HF.2.2 Private individual insurance	HF.2.3 Households	HF.2.4 Nongovernmental organizations	HF.2.5.1 Nationally owned electricity utility, AZap	HF.2.5.2 Private firms	HF.3 Rest of the world	Trial sum	Estimated total
HP.1.1.1.1 Ministry of Health general hospitals	2 540 ~~9 387~~				6 740				107 or part 13 643					? ?	9 387
HP.1.1.1.2 Ministry of Defence hospitals			116											?	116
HP.1.1.1.3 Regional general hospitals	5 299			41 ~~14 413~~	14 062	109			201 or part 13 643					? ?	19 712
HP.1.1.2 Private general hospitals					10 898		218	342	14 106 or part 13 643	263				?	25 827
HP.2.9 Other residential care	218													218	?
HP.3.1 Private physicians							1 030	1 610	part 17 070	286	53		599	?	14 551
HP.3.3 Visiting nurses					471				part 17 070					?	?
HP.3.4.1 Government polyclinics	6 473		519	521	17 175	402			part 11 965					?	519+?
HP.3.4.2 Private polyclinics					4 973		482	754	part 11 965		1 216	3 024		?	19 192
HP.3.9.9 Traditional healers									part 17 070					?	?
HP.4.1 Pharmacies									41 042					41 042	?
HP.5 Public health providers	5 262			726						1 893				7 881	?
HP.6.1 Government administrators	3 365			56										3 421	?
HP.6.2 National Insurance Agency administrators					6 518									6 518	?
HP.6.3 Insurance administrators (group)						52	400							452	?
HP.6.4 Insurance administrators (other)								574						574	?
HP.6.9 Other administrators										216				216	?
HP.8.1 Researchers		286								230				516	?
HP.8.2 Educators		43												43	?
Total	30 004	329	635	15 757	60 837	563	2 130	3 280	83 720 or 84 491	2 888	1 269	3 024	599		

Exhibit 12.16 Appia: financing agents by providers (FAxP) (preliminary) table Calendar Year 2002 (millions of crowns)

Providers	Financing agents (FA)													
	HF.1.1.1.1 Ministry of Health	HF.1.1.1.2 Ministry of Education	HF.1.1.1.3 Ministry of Defence	HF.1.1.2 Regional Government	HF.1.2 National Insurance Agency	HF.2.1.1 Government group insurance	HF.2.1.2 Private group insurance	HF.2.2 Private individual insurance	HF.2.3 Households	HF.2.4 Nongovernmental organizations	HF.2.5.1 Nationally owned electricity utility, AZap	HF.2.5.2 Private firms	HF.3 Rest of the world	Total
HP.1.1.1.1 Ministry of Health general hospitals	2 540				6 740				107					9 387
HP.1.1.1.2 Ministry of Defence hospitals			116											116
HP.1.1.1.3 Regional general hospitals	5 299			41	14 062	109			201					19 712
HP.1.1.2 Private general hospitals					10 898		218	342	14 106	263				25 827
HP.2.9 Other residential care	218													218
HP.3.1 Private physicians							1 030	1 610	11 572	286	53		599	15 150
HP.3.3 Visiting nurses					471									471
HP.3.4.1 Government polyclinics	6 473		519	521	17 175	402			904					25 994
HP.3.4.2 Private polyclinics					4 973		482	754	8 743		1 216	3 024		19 192
HP.3.9.9 Traditional healers									5 498					5 498
HP.4.1 Pharmacies									41 042					41 042
HP.5 Public health providers	5 262			726						1 893				7 881
HP.6.1 Government administrators	3 365			56										3 421
HP.6.2 National Insurance Agency administrators					6 518									6 518
HP.6.3 Insurance administrators (group)						52	400							452
HP.6.4 Insurance administrators (other)								574						574
HP.6.9 Other administrators										216				216
HP.8.1 Researchers		286								230				516
HP.8.2 Educators		43												43
Total	23 157	329	635	1 344	60 837	563	2 130	3 280	82 173	2 888	1 269	3 024	599	182 228

Exhibit 12.17 Appia: financing sources by financing agents (FSxFA) updated table Calendar Year 2002 (millions of crowns)

Financing agents		Financing sources (FS)							
		FS.1.1.1 Central government	FS.1.1.2 Regional government	FS.1.2 Other public funds	FS.2.1 Employer funds	FS.2.2 Household funds	FS.2.3 Non governmental organizations	FS.3 Rest of the world funds	Total
HF.1.1.1.1	Ministry of Health	21 619						1 538	23 157
HF.1.1.1.2	Ministry of Education	329							329
HF.1.1.1.3	Ministry of Defence	635							635
HF.1.1.2	Regional government	986	58					300	1 344
HF.1.2	National Insurance Agency	1 106		566	44 374	14 791			60 837
HF.2.1.1	Government employees health insurance				422	141			563
HF.2.1.2	Private group insurance				710	1 420			2 130
HF.2.2	Private individual insurance					3 280			3 280
HF.2.3	Households					82 173			82 173
HF.2.4	Nongovernmental organizations						1 235	1 653	2 888
HF.2.5.1	Nationally owned electricity utility (AZap)				1 269				1 269
HF.2.5.2	Private firms				3 024				3 024
HF.3	External organizations							599	599
Total		24 675	58	566	49 799	101 805	1 235	4 090	182 228

Chapter 13

Developing the tables for financing agents by functions and providers by functions

Developing the tables for financing agents by functions and providers by functions

13.01. As discussed in Chapter 1, national health accounts (NHA) do more than merely measure the financial flows between sources, financing agents, and providers in a health care system. The major analytical benefits of health accounts lie in their ability to show how expenditures were used. Decision-makers have a strong interest in the types of care provided, the equity of health care spending and its distribution across various dimensions, for example age groups and regions of the country. They also want to know what diseases and conditions account for health spending in their country. Answers to many of these questions are developed by estimating distributional tables as part of health accounts.

13.02. Unlike the statistical tables developed in previous chapters, distributional tables may not display all health spending. In some cases, they do involve the full table representation of national health expenditure using a reorganized framework where the categories are all (to use the language of mathematics) mutually exclusive and exhaustive; an example of this type of table is spending by geographical region. In other cases, the analytical dimension concerns selected aspects or elements of the health accounts. For example, policy-makers may want to know about the distribution of personal health expenditures among income deciles of the population; in such a case, spending for research, construction, and the like would not be presented. Or policy-makers may be interested in sources of funding for surgical services by type of surgical procedure, in which case the analysis would exclude all spending for non-surgical activity.

13.03. Whether the scope is complete or partial, the underlying techniques used to develop these analytical dimensions are similar. In fact, they are variations on and extensions of the techniques used in developing the health accounts. Many rely on integrating the use of national surveys or of microdata with the financing agents by providers table.

13.04. This *Guide* discusses ways to produce five different dimensions: functions, as part of statistical tables showing financing agents by functions (FAxF) and providers by functions (PxF); subnational accounts; the distribution of expenditures among population groups; expenditures by health conditions, diseases, and interventions; and inputs to the production of health goods and services. The general approaches described in this *Guide* can be modified to fit almost any other dimension of interest. The order in which the tables are created — and the frequency with which they are re-estimated — are determined by the specific policy needs of decision-makers. Before beginning to draw up any of the tables, policy-makers or their staff should be consulted in order to identify the subjects of importance to them. Consultations should be held with analysts outside the government, too — often they have the luxury of a longer view of changes in the health system and can help anticipate policy needs.

13.05. Although the choice of distributional tables depends on the specific policy concerns of the country in question, there are standards for preparing the tables. The most important of these are the use of internationally accepted classification schemes and the principle of completeness. The latter means that, while it is not necessary to show every category of spending in a table, those categories that are shown must be distributed completely.

Starting with which table?

13.06. Developing the distributional tables requires combining expenditure data on payers, providers, functions, and specific distribution-related characteristics of people using or receiving health goods and services. Two NHA statistical tables are important sources of information: those showing the financing agents by functions (FAxF, Table 5.4) and the providers by functions (PxF, Table 5.3). Which table — FAxF or PxF — is of greater policy relevance is a matter for local decision. In some countries, the policy emphasis is on where various services are provided; in such cases, the PxF table is useful. In others, the emphasis is on who pays for various services; here, the FAxF table is useful. Operationally, however, it is likely that one table cannot be populated without working on the other as well, and both may be needed for distributional analyses.

13.07. Experience in various countries suggests that preparing these tables is not a straightforward task. If the payment systems mostly pay by item of service (usually where social insurance is predominant), and if corresponding data are available, then direct estimation of the FAxF table may be feasible. More typically, however, public sector budgets are not allocated or reported by function. Rather, fixed amounts are allocated to providers (sometimes at the input level of budget, as for pharmaceuticals or salaries). In such settings, direct estimation of the FAxF table is only possible for part of the total expenditures - and even then for a relatively small part. If this is the case, some other way to proceed is needed; that is the subject of this chapter.

13.08. To populate the PxF and FAxF tables, the best course of action is probably the following sequence of steps:

- to break down as much as possible each financing agent's payments by function;
- to estimate a table of providers by functions (PxF);
- to construct the financing agents by functions (FAxF) table by combining and reconciling the results of these two estimations.

Disaggregating financing agent payments into functional classes

Where data exist

13.09. The job of populating the financing agents by functions table is easier to the extent that financing agents collect and retain information on the types of services rendered to beneficiaries. Even if they do, however, it is important to review the content of the information in each category for each financing agent to ensure that the classifications are done correctly. Regardless of similarities in name, the exact definition, the coverage (demographic and geographical), the monetary units used, the accrual basis of report and the other financial aspects already mentioned should all be checked for consistency with the standards of the health accounts.

13.10. Two financing agents, in particular, are likely to have the sort of functional breakdown useful for health accounting: social insurance systems and households.

13.11. *Social insurance systems.* In many countries, especially those with larger or better-run social insurance systems, some information is available routinely. Where a social insurance organization keeps track of its expenditure for inpatient, outpatient, and other kinds of services, rather than simply funding the operating budgets of different providers, functional expenditure data may be available from that financing agent.

13.12. Even if these data exist, however, there may still be problems adapting them to the health accounts. Often, the classification scheme used by the social insurance system will not correspond exactly to the ICHA-HC classification scheme. If so, it should be possible to create a bridge or "crosswalk" — a conversion table that assigns each reported service type to a specific ICHA-HC category. Such tables should be derived from some empirical basis, in consultation with the organization responsible for the data, and possibly with the consultation of a person typical of those who submit or report the data.

13.13. As data are acquired on functional classifications of spending, it is useful to have the data tabulated by provider as well. In the reconciliation step of this phase of the accounts, the financing agents by functions (FAxF) table will be balanced with the providers by functions (PxF) table, and having reasonably solid data for as much of this as possible will make the results much more sound.

13.14. *Households.* For many types of services funded by household spending, household survey data will usually be the main information source. As discussed in Chapter 8, those surveys will typically be one of two types: a general household budget survey or a health-specific household survey.

13.15. If a health-specific survey is being used for the primary estimates, it may be possible to make direct estimates of the functional distribution of household spending. Typically, these surveys collect expenditure data based on reports of specific health conditions or diagnoses and treatment actions at the individual and household level. Treatment actions are often classified in these surveys according to function. If detailed survey data are available, the expenditure items in the survey should be matched to relevant functions.

13.16. As with social insurance data, classifying household survey data into functions may require some judgement. The expenditure items in a survey may not correspond very closely to the functional classification of the NHA; for example, the survey may record all expenditures for pharmacy purchases and laboratory tests under one combined expenditure item. Where these types of situations arise, some technique similar to those described in Chapter 11 is needed to allocate spending among functions — discussions with other experts, indirect evidence from provider surveys, and so on. If all else fails, the spending must be allocated among the functional classifications based on judgement and guided by the other entries in the table. Regardless of what procedure is used, thorough documentation is required for the benefit of those who follow and of those to whom the work must be explained.

13.17. If a general household budget survey is being used to prepare the estimates, the task may be more complicated. Often, these surveys are "stronger" surveys in terms of statistical power, sampling error, and non-sampling error, but they typically collect little if any health spending details. In such a case, a household health expenditure survey that collects greater detail must be used — or, if need be, commissioned. But such a survey has problems of its own. Greater detail typically comes at the cost of a smaller sample size, making the survey less useful at the national level. Nevertheless, the functional shares obtained from the smaller, more detailed survey can be applied to the total spending derived from the larger, less detailed survey.

13.18. Sometimes the more detailed health expenditure survey suffers from greater problems than the household budget survey, such as overreporting or underreporting. If this bias is believed to be similar across all items of spending in the survey, however, then the breakdown of expenditures in the detailed survey can still be used to estimate the percentage distribution by function of household-funded services in the health account. If the bias is believed to be greater for some items than for others, the distribution should be adjusted before being applied to the total figure. For example, if physician services are believed to be more seriously underreported than are hospital services, the physician share can be raised relative to the hospital share. If the relative biases are not known, the best assumption to make is that there are no relative biases. As with other decisions made during preparation of the health accounts, each decision made should be documented.

13.19. Detailed survey data may be available only at infrequent intervals. In this situation, it may be necessary to extrapolate or interpolate the shares in distribution of household spending between years for which data are available (see Annex D).

13.20. Because household surveys are likely to be one of the most important sources of information in developing the functional classification of expenditures, they should be of the highest possible quality. If the existing household budget survey questionnaire does not fit the classification schedule used in the NHA, the country's health accountants should work with the statistical agency to modify the detailed schedules to obtain more relevant breakdowns in future years; support from the steering committee can be very helpful in this regard.

Where data are not available

13.21. More often than not, there will not be solid data on the functional classification of health spending. Where this is the case, there are several techniques that can be used to estimate that breakdown. These are described in the remainder of this section.

13.22. *Use of government programme budgets.* Coding expenditures by function is simplest in the case of government accounting systems that organize expenditures according to "programme budgets". Programme budgets are methods of budgeting and accounting where expenditures are planned and recorded according to programmatic and functional classifications, rather than provider or line item classifications. If these programmes are sufficiently detailed, it may be possible to assign a single function to each programme or subprogramme, and thus code much (or even all) of the government's spending. For instance, expenditures in a programme designed to provide well-baby examinations to infants under 2 years of age would be allocated to HC.6.1 (maternal and child health). This type of approach has been adopted in Sri Lanka, among other countries.

13.23. When such an approach is used it is important to seek advice and confirmation from knowledgeable programme staff regarding the codes being assigned to their programmes. Sometimes the actual use of expenditures in a programme differs from the stated purpose in government budgetary documents, in which case this approach will not work.

13.24. Programme budgets may not be detailed enough to permit direct coding of all expenditures. In these cases, expenditures must be distributed to specific functions within each programme. Standard practices of cost accounting can be applied to make such allocations. For example, the expenditure of a programme can be allocated to functions according to the percentage of staff time allocated to each function, or according to the distribution of commodities in the case of a procurement and supplies division. The data necessary for such breakdowns are usually available only in the departments concerned, and experience indicates that success is more likely when department staff are involved in the exercise of estimation. In some cases, special cost studies may be available or undertaken to derive cost allocations by function.

13.25. *Use of private sector data.* Chapters 6 and 8 contain some guidance on conducting sample surveys of private sector entities such as nongovernmental organizations, firms and employers, and commercial insurers. Experience in various countries suggests that sufficient routine administrative data are unlikely to exist for these types of financing agents to allow for an estimate of their spending and how it breaks down by provider and function. These surveys need not be comprehensive or frequent. Nongovernmental organizations, firms and commercial insurance schemes tend to have typical profiles of expenditure. For example, private employers may only have significant expenditures on inpatient and outpatient care, occupational health services, and donations to health care providers. For this reason, surveys of their expenditures can usually be simplified by only asking respondents to provide breakdowns of spending into a few items. The periodicity of such surveys can also be reduced if there is stability over time in the distribution of expenditures by provider or function. The Appia example in Chapter 11, where the team supplemented their survey by questioning a few large respondents to clarify and deepen the information provided, is a useful approach to follow.

13.26. Insurance firms in many countries do not keep aggregate data on the functional breakdown of claims. If they cannot be persuaded to keep such records, it may be necessary in some instances to analyse samples of medical insurance claims in order to determine the percentage breakdown of expenditures, both by function and by provider, as described in the Appia example in Chapter 11.

Estimating the providers by functions table

13.27. For those parts of health expenditure for which there is no existing functional breakdown, the most feasible approach is likely to be to break down spending by provider type. In theory, all expenditures that can be allocated to a specific provider can also be allocated to the classes of functions in the ICHA-HC (or other functional classification being used) — if not, those expenditures should not be in the estimate of total health spending.

13.28. All or part of the providers by functions (PxF) table should, therefore, be developed as an important step in estimating the financing agents by functions (FAxF) table. This activity is very similar in nature to that employed in developing the financing agents by providers (FAxP) table. The task is to estimate the use of expenditures by function for each provider type, knowing what the total expenditure is for that provider type. Creating the PxF table also allows a check of the validity of any of the data on functions, provided for financing agents.

Single function providers

13.29. Some providers only offer services in one functional classification. For example, retail pharmacies may provide only goods classified as HC.5.1 (pharmaceuticals and other medical nondurables). Clinical laboratories only offer services classified as HC.4.1. Where this is the case, all spending for the services of the provider can be assigned to that one function with relative confidence.

Multifunction providers

13.30. The larger provider types usually provide more than one kind of service. For example, hospitals typically provide both inpatient care and outpatient care. The facility's financial control systems may yield data that permit an estimation of the breakdown. If not, those estimates must be based on data from cost surveys. Such studies tend to be complicated and expensive; in low-income and middle-income countries, they are likely to be sample surveys repeated infrequently. On the positive side, in many countries such surveys have already been carried out for other research purposes.

13.31. One of the more difficult tasks in allocating spending among functions for these providers is the treatment of general and administrative expenses. Administrative expenses of a provider are not allocated to function HC.7 (health administration and health insurance). Rather, they are included as part of the cost of the services provided. If the provider's cost accounting system does not already do so, the general and administrative expenses must be allocated among the various functions provided. There are several ways to do this, some of which are more sophisticated than others. For example, the crudest way (and often the best way) is to allocate general and administrative expenses among functions in the same proportions as other expenses were allocated. Or, general and administrative expenses could be spread among functions in proportion to the physical units involved (such as visits or days of care). The choice of approaches depends upon the time and resources available as well as on theoretical plausibility.

13.32. When distributing general and administrative expenses among ICHA-HC categories, the cost of research or construction must be removed. In some countries, capital expenditure is considered to be a line item in the hospital budget and is included with general expenses. To adhere faithfully to the ICHA-HC classification scheme, this spending must be moved to HC.R.1. The remaining general expenditure of the provider is prorated among the functional classes (including research or construction, if appropriate).

Reconciling the results

13.33. Once financing agent spending has been disaggregated by function to the extent possible and a providers by functions (PxF) table has been populated, the results must be reconciled. This helps in two ways. First, it helps to allocate financing agent expenditure for which there is no clear function identifiable from the data. Second, it helps to refine the estimates of the provider breakdown by function and the financing agent breakdown by function.

13.34. Although the practical process of reconciliation is similar to that for the financing agents by providers (FAxP) table, it is a little more difficult. In the case of FAxP, a two-dimensional table is being reconciled; here, in essence, a third dimension has been added to the work (financing agents, providers and functions). There is no single best way to go about this reconciliation. One way is to use the FAxP table as a starting point and proceed row by row (that is, provider by provider). In each cell of the row, all known information about each financing agent's functional breakdown of spending is entered. Table 13.1 shows an example of this; for the sake of simplicity in this explanation, it is assumed that there are only two classes of financing agents and two functional classes. In reality there are more, but the same process can be applied. Each upper-case and lower-case letter in the box represents an amount (which may be missing).

Table 13.1 Example of reconciliation table

Provider (P)	Financing agents (FA)			
	Unallocated	FA 1	FA 2	Total
P1	Tot:	Tot: B	Tot: C	Tot: A
	Fn1: d-f-h	Fn1: f	Fn1: h	Fn1: d
	Fn2: e-g-k	Fn2: g	Fn2: k	Fn2: e

Note: Fn = functional class.
A, B, C, d, e, f, etc = amounts.

13.35. To set up the reconciliation table, the margin totals for spending by financing agents and for spending by provider type are entered, taken from the FAxP table constructed in Chapter 12 (these are shown as amounts A, B, and C in Table 13.1). Then for each provider, the estimates already made for each function are entered into the appropriate cell (in Table 13.1 those are amounts d to k). If the provider total functional breakdown (d and e) is unknown then these are summed from the financing agent entries. If some or any of the financing agent breakdowns are unknown, they can be estimated by evaluating the "unallocated" spending in the cell and using some rule to spread that unallocated spending among the missing pieces. If all the detailed figures are available, the layout of Table 13.1 can be used to reconcile the provider estimate of functions with the financing agent estimate of functions. The case where none

Box 13.1
Notional Allowances

The idea of making a notional allowance may seem difficult to accept at first. The health accountant has a responsibility as the producer of the nation's health accounts to present the most accurate picture of the health system possible. Even if the size of a cell entry itself is not known, however, the health accountant is obliged to make an estimate that is as close as possible to reality. Fortunately, the sizes of the cell entries involved are small. Equally fortunately, being open about what has been done often prompts a hitherto unknown data source to step forward with information that can be used in future cycles of the national health accounts.

of the details is available poses the greatest challenge, because the cell cannot be left blank. In such a case, some form of "notional allowance" must be inserted in order not to delay completion of the work (see Box 13.1). But where such an allowance is made, it must be documented thoroughly, with the resolve to find some way to avoid the situation in future cycles of the accounts.

13.36. Reconciliation is done step by step. Three dimensions of accounts are being manipulated, so it may be difficult to maintain consistency in the relationships among various elements in the different dimensions. When the process described above has been completed, it is important to review the functional breakdown for each financing agent (and across financing agents) to make sure that the set of figures makes sense together as well as individually.

Classifying activities into functions

Categorizing services ancillary to medical care

13.37. Categorizing services ancillary to medical care (HC.4) and estimating spending on such services poses some special challenges in implementation. This category is used to record services of providers not affiliated with an inpatient or ambulatory care entity. In one sense the category seems to violate the functional classification system — service-related expenditures should be included with the primary type of service with which they are associated. However, where the charges for these services are separate from the charges for the inpatient or ambulatory care they support, it may be appropriate to categorize them separately. If it is relevant to health policy and if the data exist to support it, health accountants may wish to create subcategories for those ancillary services in support of the functions described in HC.1 to HC.3 (for example, HC.4.1.1 could be used for ancillary services in support of inpatient curative care).

Categorizing medical goods dispensed to outpatients

13.38. As with services ancillary to medical care, the functional classification HC.5 (medical goods dispensed to outpatients) is used to record provision of those goods when the activity is distinct from the provision of other services. Pharmaceuticals and other medical goods used by hospitals as part of inpatient treatment, for example, are appropriately categorized in HC.1.1 (or HC.2.1 or HC.3.1). Similarly, pharmaceuticals used in the course of a physician encounter (or similar provider visit) should be included with that encounter. However, if the filling of a prescription or purchase of a medical device or other good is separate from the provider encounter in which the prescription was issued, it should be considered as a separate activity and recorded in HC.5. This treatment has theoretical validity in the sense that consumers have the option of not obtaining the prescribed pharmaceutical or other good, independently of the other health care encounter. It also is rooted in a long-standing tradition among health accountants that predates the SHA or this *Guide*. Again, as with ancillary services, if it is policy-relevant and practical, health accountants may wish to create subcategories to record the type of event with which the pharmaceutical or other good is associated (for example, HC.5.1.1.1 for prescribed pharmaceuticals associated with curative care). This subcategorization nevertheless requires a rich data environment to sustain it.

Creating the financing agents by functions and providers by functions tables in Appia

13.39. In the following example, all services in Appia are assumed to be curative; that is, HC.2 and HC.3 are ignored. In practice this is not the case, but the assumption simplifies the example and still shows the types of estimation steps that are taken.

13.40. Having completed its provisional financing sources by financing agents (FSxFA) and financing agents by providers (FAxP) tables, the Appian NHA team now begins to develop its financing agents by functions (FAxF) and providers by functions (PxF) table. The team discovers that it is more useful to develop the two tables concurrently rather than sequentially.

13.41. In organizing this phase of its work, the team contacts staff at the National Insurance Agency and at the Appian Government Employees Health Fund. They ask for a special tabulation of a sample of claims so that a distribution of spending by functional classification can be determined for each provider type.

13.42. While this tabulation is being prepared, the team joins colleagues at the Ministry of Health in looking at the ministry's budget report (see Exhibit 10.7 on page 153). Some of the budget line items and programmes can be translated directly into ICHA-HC classifications at the one-digit level (see Exhibit 13.1). Upon discussions with Ministry of Health staff, it is agreed that budget code 7.02.06 is classified as HC.1.3. Code 7.03.00 can be allocated to HC.7.1.1. Code 7.04.00 is mapped to HC.6.3. Code 7.06.00 can be allocated partly to HC.6.9, but the ¢1538 million provided by the international organization and channelled through this account was used for family planning and must be coded HC.6.1. Code 7.08.00 is allocated completely to HC.1.3. Codes 7.10.00 and 7.11.00 are not mapped to a functional classification, because the Ministry of Health is not the financing agent of record — in the health accounts, the spending is recorded with regional governments. Code 7.12.00 is allocated to HC.7.1.1.

Exhibit 13.1 Appia: crosswalk of Ministry of Finance budget codes to ICHA-HC codes

Description	Ministry of Finance budget code	ICHA-HC code
Operation of Ministry of Health hospitals	7.01.00	1.1 & 1.3 & R.1
Operation of Ministry of Health orphanages	7.02.06	1.3
Regulation of pharmaceutical and medical device industries	7.03.00	7.1.1
Activities against epidemics	7.04.00	6.3
Miscellaneous health-related activities	7.06.00	6.9 & 6.1
Hospital care in other facilities	7.07.00	1.1 & 1.3
Care in polyclinics and ambulatory care	7.08.00	1.3
Assistance of regional authorities	7.10.00	---
Assistance of National Insurance Agency	7.11.00	---
Maintenance of central accounting system	7.12.00	7.1.1

13.43. Unfortunately, the Ministry of Finance figures cannot help allocate Ministry of Health hospital expenditures to the ICHA-HC classifications. The team agrees that code 7.01.09 belongs with investment, but the remainder are identified by type of input rather than type of output. So, the NHA team contacts the Ministry of Health hospitals, asking for their internal reports. The hospitals report back that they spent

¢4693 million on inpatient care, ¢1018 million on outpatient care, and ¢3676 million in general administrative expenses. Probing, the team learns that this last amount includes the spending for new hospital construction — code 7.01.09. The remainder, ¢2959 million, must be included with the hospital care rather than government administration (HC.7.1.1), so the team allocates it to inpatient and outpatient care proportionately to identified spending on those services. That is, 82% of general administrative expenses — 4693/(4693+1018) — is allocated to inpatient services and the remaining 18% is allocated to outpatient services. These figures are reported in Exhibit 13.2. This information can be combined with other data to break down Ministry of Health payments as a financing agent: patients are charged no co-payment for inpatient care — the entire amount paid by them is for outpatient care. The tabulation of claims provided by the National Insurance Agency is used to break down the Agency's payments to Ministry of Health hospitals, so the Ministry of Health payments as a financing agent can be found by subtraction.

Exhibit 13.2 Appia: Ministry of Health hospitals worksheet
Calendar year 2002 (millions of crowns)

	Total			Housholds	National Insurance Agency	Ministry of Health
	Direct	General & administrative	Total			
Ministry of Health hospitals	Total: 6 428	2 959	9 387	Total: 107	Total: 6 740	Total: 2 540
	1.1: 4 693	2 432	7 125	1.1: 0	1.1: 5 931	1.1: 1 194
	1.3: 1 018	527	1 545	1.3: 107	1.3: 809	1.3: 629
	R.1: 717		717			717
Comments				Distribution known from law (see paragraph 13.43)	Special tabulation done by NIA staff	Found as a residual

13.44. Nor can the team immediately disaggregate Ministry of Health spending on services in regional hospitals or in regional polyclinics. So it sets aside the Ministry of Health records and takes up an examination of these providers (see Exhibit 13.3, page 206). Talks with a number of regional hospital budget administrators suggest that 63% of their spending is on inpatient care and the rest on outpatient care. The team decides to follow the same exercise for regional hospitals as it has done for Ministry of Health hospitals, splitting financing agent funds proportionately, yielding an inpatient to outpatient ratio of 63:37. In this case there are two "unknown" financing agent distributions rather than one, but the logic is the same.

13.45. This leaves private hospital spending to distribute (the Ministry of Defence hospital classification had been dealt with in a telephone call to the Ministry of Defence health budget office). The problem here is that it is not possible to examine a sample of hospital records nor to survey administrators. Fortunately, Appia University conducted a cost study of the private hospital association one year earlier, estimating the costs of providing inpatient and outpatient care. The team applies the relative sizes of the inpatient and outpatient shares from that study to this year's entry in the financing agents by providers (FAxP) table and combines this estimate with the estimated functional breakdowns from the National Insurance Agency, following the techniques used for regional hospitals. These calculations are presented in Exhibit 13.4 (see page 206).

13.46. Turning to polyclinics, the team interviews administrators of several government polyclinics, as it is known that they provide prescription drugs in addition to patient care. The interviewees report figures that range from 75% to 90% as the proportion of their non-capital budget that goes for outpatient drugs, with the average being about 85% (see Exhibit 13.5, page 207). The team decides to use that mean to divide the total figure — and to distribute private polyclinic spending as well, in the absence of any other information. The polyclinic administrators also indicate that there is no reason to differentiate the split of spending between pharmaceuticals and services by type of payer, so the team applies the same proportionate split to household and other payers' spending in polyclinics (using the National Insurance Agency and Government Employees Health Fund figures as reported). Both of these decisions are documented and filed under "future improvements in the accounts".

13.47. Anecdotal evidence suggests that almost all services provided by private physicians are patient care, with a small percentage attributable to prescription drugs. The team makes a "notional allowance" of 5% for the latter, and again files the decision with future improvements, perhaps to be reviewed when the input/output table is finished for the economy as a whole.

13.48. After a small amount of additional work with various financing agents, the team has a table that contains a breakdown of spending by provider, function, and financing agent (Exhibit 13.6, see pages 208 and 209) that can be used to develop the providers by functions (PxF) and financing agents by functions (FAxF) tables (see Exhibits 13.7 and 13.8, pages 210 and 211). These tables include subtotal rows to show expenditure on personal health care and total current expenditure on health (see paragraph 3.22), as well as a total row for national health expenditure. The NHA team is now in a position to look at the distribution of expenditures among groups of policy interest, a topic discussed in the next chapter.

Exhibit 13.3 Appia: regional government hospitals worksheet Calendar year 2002 (millions of crowns)

	Total	Housholds	National Insurance Agency	Government employee insurance	Unallocated balance	Regional Government	Ministry of Health
Regional government hospitals	Total: 19 712	Total: 201	Total: 14 062	Total: 109	Total: 5 340 100.0%	Total: 41	Total: 5 299
	1.1: 12 419	1.1: 0	1.1: 9 422	1.1: 60	1.1: 2 937 55.0%	1.1: 23	1.1: 2 914
	1.3: 7 293	1.3: 201	1.3: 4 640	1.3: 49	1.3: 2 403 45.0%	1.3: 18	1.3: 2 385
Comments		Distribution known from law (see paragraph 13.44)	From special NIA tabulation	From special tabulation	Use this proportion to allocate financing agent with unknown distribution		Include rounding differences

Exhibit 13.4 Appia: private general hospitals worksheet Calendar year 2002 (millions of crowns)

	Total	National Insurance Agency	Unallocated balance	Private group insurance	Individual insurance	Non governmental organizations	Households
Private general hospitals	Total: 25 827	Total: 10 898	Total: 14 929 100.0%	Total: 218	Total: 342	Total: 263	Total: 14 106
	1.1: 23 244	1.1: 9 718	1.1: 13 526 90.6%	1.1: 198	1.1: 310	1.1: 238	1.1: 12 780
	1.3: 2 583	1.3: 1 180	1.3: 1 403 9.4%	1.3: 20	1.3: 32	1.3: 25	1.3: 1 326
Comments	1998 industry cost study shares applied to year for which national health accounts are being drawn up	Tabulation of sample records	Use percentage distribution to allocate unknown financing agent money				Include rounding differences

Exhibit 13.5 Appia: polyclinics worksheet Calendar year 2002 (millions of crowns)

	Total	National Insurance Agency	Government employee insurance	Unallocated balance	Households	Regional Government	Ministry of Health
Regional government polyclinics	Total: 25 475	Total: 17 175	Total: 402	Total: 7 898 100.0%	Total: 904	Total: 521	Total: 6 473
	1.3: 21 654	1.3: 14 633	1.3: 334	1.3: 6 687 84.7%	1.3: 765	1.3: 441	1.3: 5 481
	5.1: 3 821	5.1: 2 542	5.1: 68	5.1: 1 211 15.3%	5.1: 139	5.1: 80	5.1: 992
Comments	Split non-capital: capital in ratio 85:15	From special NIA tabulation	From special tabulation	Use this proportion to allocate financing agent with unknown distribution			Include rounding differences

	Total	Ministry of Defence
Ministry of Defence polyclinics	Total: 519	Total: 519
	1.3: 430	1.3: 430
	5.1: 76	5.1: 76
	R.1: 13	R.1: 13
Comments	Split non-capital: capital in ratio 85:15	

	Total	National Insurance Agency	Unallocated balance	Private group insurance	Individual insurance	Nationally owned electricity utility (AZap)	Private firms	Households
Private polyclinics	Total: 19 192	Total: 4 973	Total: 14 219 100.0%	Total: 511	Total: 725	Total: 1 216	Total: 3 024	Total: 8 743
	1.3: 16 313	1.3: 4 162	1.3: 12 151 85.5%	1.3: 437	1.3: 620	1.3: 1 039	1.3: 2 584	1.3: 7 471
	5.1: 2 879	5.1: 811	5.1: 2 068 14.5%	5.1: 74	5.1: 105	5.1: 177	5.1: 440	5.1: 1 272
Comments	Split non-capital 85:15	From special National Insurance Agency tabulation	Use this proportion to allocate financing agent with unknown distribution					Include rounding differences

Exhibit 13.6 Appia: combined table of financing agents by providers and functions Calendar Year 2002 (millions of crowns)

Providers and Functions		Financing agents (FA)														
		HF.1.1.1.1 Ministry of Health	HF.1.1.1.2 Ministry of Education	HF.1.1.1.3 Ministry of Defence	HF.1.1.2 Regional Government	HF.1.2 National Insurance Agency	HF.2.1.1 Government group insurance	HF.2.1.2 Private group insurance	HF.2.2 Private individual insurance	HF.2.3 Households	HF.2.4 Nongovernmental organizations	HF.2.5.1 Nationally owned electricity utility, AZap	HF.2.5.2 Private firms	HF.3 Rest of the world	Total	Check against financing agents by providers (FAxP) table
HP.1.1.1.1	Ministry of Health general hospitals	(2 540)				(6 740)				(107)					(9 387)	(9 387)
	HC.1.1	1 194				5 931				0					7 125	
	HC.1.3	629				809				107					1 545	
	HC.R.1	717				0				0					717	
HP.1.1.1.2	Ministry of Defence hospitals			(116)											(116)	(116)
	HC.1.1			35											35	
	HC.1.3			81											81	
HP.1.1.1.3	Regional general hospitals	(5 299)			(41)	(14 062)	(109)			(201)					(19 712)	(19 712)
	HC.1.1	2 914			23	9 422	60								12 419	
	HC.1.3	2 385			18	4 640	49			201					7 293	
HP.1.1.2	Private general hospitals					(10 898)		(218)	(342)	(14 106)	(263)				(25 827)	(25 827)
	HC.1.1					9 718		198	310	12 780	238				23 244	
	HC.1.3					1 180		20	32	1 326	25				2 583	
HP.2.9	Other residential care	(218)													(218)	(218)
	HC.1.3	218													218	
HP.3.1	Offices of physicians							(1 030)	(1 610)	(11 572)	(286)	(53)		(599)	(15 150)	(15 150)
	HC.1.3							979	1 530	10 993	272	50		569	14 393	
	HC.5.1							51	80	579	14	3		30	757	
HP.3.3	Visiting nurses					(471)									(471)	(471)
	HC.1.3															

HP.3.4.1	Government polyclinics	(6 473)		(519)	(521)	(17 175)	(402)			(904)					(25 994)	(25 994)
	HC.1.3	5 481		430	441	14 633	334			765					22 084	
	HC.5.1	992		76	80	2 542	68			139					3 897	
	HC.R.1			13											13	
HP.3.4.2	Private polyclinics					(4 973)		(482)	(754)	(8 743)		(1 216)	(3 024)		(19 192)	(19 192)
	HC.1.3					4 162		437	620	7 471		1 039	2 584		16 313	
	HC.5.1					811		74	105	1 272		177	440		2 879	
HP.3.9.9	Traditional healers									(5 498)					(5 498)	(5 498)
	HC.1.3									5 498					5 498	
HP.4.1	Pharmacies									(41 042)					(41 042)	(41 042)
	HC.5.1									41 042					41 042	
HP.5	Public health provision	(5 262)			(726)						(1 893)				(7 881)	(7 881)
	HC.6.1	1 538													1 538	
	HC.6.2				726										726	
	HC.6.3	3 338													3 338	
	HC.6.9	386									1 893				2 279	
HP.6.1	Government administration	(3 365)			(56)										(3 421)	(3 421)
	HC.7.1.1	3 365			56										3 421	
HP.6.2	National Insurance Agency administration					(6 518)									(6 518)	(6 518)
	HC.7.1.2					(6 518)									6 518	
HP.6.3	Insurance administrators (group)						(52)	(400)							(452)	(452)
	HC.7.2						52	400							452	
HP.6.4	Insurance administrators (non-group)								(574)						(574)	(574)
	HC.7.2								574						574	
HP.6.9	Other administrators										(216)				(216)	(216)
	HC.7.2										216				216	
HP.8.1	Research										(230)				(516)	(516)
	HC.R.3		(286)								230				516	
HP.8.2	Education		(43)												(43)	(43)
	HC.R.2		43												43	
Total financing agent spending		(23 157)	(329)	(635)	(1 344)	(60 837)	(563)	(2 130)	(3 280)	(82 173)	(2 888)	(1 269)	(3 024)	(599)	(182 228)	(182 228)
Check against financing agents by providers (FA*P) table		(23 157)	(329)	(635)	(1 344)	(60 837)	(563)	(2 130)	(3 280)	(82 173)	(2 888)	(1 269)	(3 024)	(599)	(182 228)	

Exhibit 13.7 Appia: estimated providers by functions (PxF) table Calendar Year 2002 (millions of crowns)

Functions	Providers																			Total
	HP.1.1.1.1 Ministry of Health general hospitals	HP.1.1.1.2 Ministry of Defence hospitals	HP.1.1.1.3 Regular general hospitals	HP.1.1.2 Private general hospitals	HP.3.1 Offices of physicians	HP.2.9 Other residential care	HP.3.3 Visiting nurses	HP.3.4.1 Government polyclinics	HP.3.4.2 Private polyclinics	HP.3.9.9 Traditional healers	HP.4.1 Pharmacies	HP.5 Public health provision	HP.6.1 Government administration	HP.6.2 National Insurance Agency administration	HP.6.3 Insurance administrators (group)	HP.6.4 Insurance administrators (nongroup)	HP.6.9 Other administrators	HP.8.1 Research	HP.8.2 Education	
HC.1.1 Inpatient curative care	7 125	35	12 419	23 244																42 823
HC.1.3 Outpatient curative care	1 545	81	7 293	2 583	218	14 393	471	22 084	16 313	5 498										70 479
HC.5.1 Pharmaceuticals and other medical nondurables						757		3 897	2 879		41 042									48 575
Subtotal: total expenditure on personal health care	8 670	116	19 712	25 827	218	15 150	471	25 981	19 192	5 498	41 042	0	0	0	0	0	0	0	0	161 877
HC.6.1 Family planning and counselling												1 538								1 538
HC.6.2 School health services												726								726
HC.6.3 Prevention of communicable diseases												3 338								3 338
HC.6.9 Other public health services												2 279								2 279
HC.7.1.1 General government administration													3 421							3 421
HC.7.1.2 Social security administration														6 518						6 518
HC.7.2 Private health insurance other private administration															452	574	216			1 242
Subtotal: total current expenditure on health	8 670	116	19 712	25 827	218	15 150	471	25 981	19 192	5 498	41 042	7 881	3 421	6 518	452	574	216	0	0	180 939
HC.R.1 Capital formation of health providers	717							13												730
HC.R.2 Education and training of health personnel																			43	43
HC.R.3 Research and development in health																		516		516
Total national health expenditure	9 387	116	19 712	25 827	218	15 150	471	25 994	19 192	5 498	41 042	7 881	3 421	6 518	452	574	216	516	43	182 228

Exhibit 13.8 Appia: estimated financing agents by function (FAxF) table Calendar Year 2002 (millions of crowns)

Functions	Financing agents (FA)													Total
	HF.1.1.1.1 Ministry of Health	HF.1.1.1.2 Ministry of Education	HF.1.1.1.3 Ministry of Defence	HF.1.1.2 Regional Government	HF.1.2 National Insurance Agency	HF.2.1.1 Government group insurance	HF.2.1.2 Private group insurance	HF.2.2 Private individual insurance	HF.2.3 Households	HF.2.4 Nongovernmental organizations	HF.2.5.1 Nationally owned electricity utility, AZap	HF.2.5.2 Private firms	HF.3 Rest of the world	
HC.1.1 Inpatient curative care	4 108		35	23	25 071	60	198	310	12 780	238				42 823
HC.1.3 Outpatient curative care	8 713		511	459	25 895	383	1 436	2 182	26 361	297	1 089	2 584	569	70 479
HC.5.1 Pharmaceuticals and other medical nondurables	992		76	80	3 353	68	125	185	43 032	14	180	440	30	48 575
Subtotal: total expenditure on personal health care	13 813	0	622	562	54 319	511	1 759	2 677	82 173	549	1 269	3 024	599	161 877
HC.6.1 Family planning and counselling	1 538													1 538
HC.6.2 School health services				726										726
HC.6.3 Prevention of communicable diseases	3383													3 338
HC.6.9 Other public health services	386									1 893				2 279
HC.7.1.1 General government administration	3 365			56										3 421
HC.7.1.2 Social security administration					6 518									6 518
HC.7.2 Private health insurance and other private administration						52	400	574		216				1 242
Subtotal: total current expenditure on health	22 440	0	622	1 344	60 837	563	2 159	3 251	82 173	2 658	1 269	3 024	599	180 939
HC.R.1 Capital formation of health providers	717		13											730
HC.R.2 Education and training of health personnel		43												43
HC.R.3 Research and development in health		286								230				516
Total national health expenditure	23 157	329	635	1 344	60 837	563	2 159	3 251	82 173	2 888	1 269	3 024	599	182 228

Chapter 14

Distributing health expenditure among the population

14.01. Chapter 5 of this *Guide* introduced four important dimensions of health expenditure: subnational or geopolitical; demographic; socioeconomic; and health status or health need. Production of tables showing the distribution of health spending along these dimensions supports a central promise of the national health accounts (NHA) enterprise — providing policy-relevant information that can help improve health system performance.

14.02. Such tables, and others not explicitly treated here, may provide some of the main benefits of health accounting, as beneficiaries of the health system are at the centre of most policies designed to focus on the effectiveness, equity, and efficiency of that system. General government is not only a stakeholder involved in consumption or in eliciting funds; it steers the production process, whether through private or public agents, in ways that redistribute income and wealth across the population. The SNA93 recognizes that redistributive role but fails to resolve it fully and leaves it to satellite accounts (see Annex C) or functional accounts to evaluate the health system in terms of selected outcomes. Policy analysis demands more than a measure of financial flows: after the level of resources has been assessed, indicators that address the concerns of equity, efficiency and effectiveness and that better equip the stakeholders to increase their direction of the system are in high demand.

14.03. These tables are described toward the end of this *Guide* because in health accounting, as in any other endeavour, one must learn to walk before one can run. The high cost of establishing health accounts might result in an early concentration on the FAxP, PxF, and FAxF tables that trace the details of resource flows from financing agents to providers and from financing agents to functions, or from providers to functions (sometimes replaced in the early stages of an accounting process by a cross-classification with financing sources or a cross-classification with resource costs). These tables take precedence in the order of implementation because in the template presented they are those that allow the health accountant to estimate the level of resources entering and exiting the health system — information without which there is no accounting and no accountability. Thus, the late appearance of a discussion of the distribution of health expenditure among the population reflects not lower priority, but rather the need to assemble more fundamental data before being able to produce these valuable results.

14.04. Even if the team undertaking the accounting process must produce basic data before anything else, once it does it cannot pause for long before moving on to more complex tasks. Policy-makers will quickly demand more, better, and faster information from the health accounts about the performance of the health care system, and health accountants must be prepared to meet those demands.

14.05. Production of these distributional tables is not necessarily as resource intensive as is the production of the FAxP or PxF tables. Where population surveys already exist, the distributional tables may absorb far less labour than the other tables. Furthermore, they may not need annual recalculation in great detail. Not only are shortcuts available for quick interpolation, extrapolation, or imputation, but the distributions involved tend to exhibit a structural evolution that seldom changes abruptly except in the face of major reforms and exceptional circumstances. This is helpful, because distributional tables require data from surveys that are typically conducted at infrequent intervals.

14.06. This chapter treats the main distributional dimensions sequentially. However, as will become clear, they are not unrelated exercises. Rather, they have many similar elements and can be mutually reinforcing.

Subnational accounts and geopolitical distributions

14.07. In many countries there is an interest, even a need, to use health accounts to monitor the funding and use of expenditures at the subnational level. This is most prominent in countries with federal systems of government or where responsibility for health policy is shared by both national and regional

authorities. Subnational accounts consist of health expenditure tables that present the flow of expenditures from financing agents to providers or functions within a given subnational region. They are related to — but not the same as — the analysis of beneficiary incidence by geographical region, where the emphasis is on the distribution of expenditures that have already been measured.

14.08. Well-established procedures and approaches exist for extending national accounts to a subnational level, and many of these carry over to health accounts. Health accountants should build partnerships with their counterparts who prepare subnational accounts for gross domestic product or who are engaged in other integrated regional data systems to benefit from their experience in these domains and to learn about their methods. The development of full subnational health accounts is, however, relatively recent and still somewhat experimental in the countries that do publish such estimates. These countries include Australia, Canada, China, Mexico, the Philippines, Spain, Sri Lanka, and the United States.

14.09. Regional accounts tend to be "top-down" rather than "bottom-up". That is, they comprise in large part an allocation of national estimates to local levels, rather than building up independent estimates for each regional unit that aggregate to a national total. Either approach has strengths and weaknesses. For example, the top-down method is likely to require less staff time and data generation, but may yield estimates of dubious reliability regarding interregional comparisons. The bottom-up approach can produce more accurate regional estimates, but also introduces the organizational challenge of making sure that each region's estimates are prepared using the same classification standards and definitions and that they are compatible with national estimates. In countries with strong state or provincial administrations, subnational authorities may develop "bottom-up" accounts for their own purposes, whether or not national estimates exist. In any case, in most — perhaps all — cases, subnational accounts permit only a measure of territorial production, and health accountants must attempt to measure the cross-border flows of patients; in essence, they must estimate regional "imports" and "exports" of health services.

Defining subnational units

14.10. The key question in developing subnational accounts is how to define which expenditures are associated with a specific subnational area. There are two options: (a) expenditures can be located according to the place of residence of the beneficiaries, or (b) expenditures can be located according to the place where they are incurred. Each organization of data is appropriate for a particular set of policy concerns. Organizing by place of residence reflects differences in regional patterns in use of health care services, while organizing by place of service reflects the use of funds by regional authorities (including those used to pay for treatment of people from other regions).

14.11. The choice between these alternatives may be influenced by the data available. In most instances of budgetary expenditures, expenditure information is available only by provider entity or purchasing entity, and so expenditures can be associated with the location of the provider or purchasing entity but not with the residence of the beneficiary. The distinction becomes important when movements of patients across jurisdictional boundaries are significant. In these cases, expenditures can only be assigned by location of residence of beneficiary if surveys are carried out of the residence of patients attending treatment facilities or supported by funding agencies. The reverse problem arises with the analysis of household survey data, where the location of the household is known, but where the location of the providers used usually is not.[20]

14.12. In practice, both situations can exist in a country. A practical solution may be to define the subnational accounts using one approach, making allowance for relaxing this definition where data limitations require. This is not a compromise but rather an acknowledged inconsistency. Data sources should be developed to cope with such limitations in later cycles of the NHA.

[20] In countries that use insurance schemes to fund health care services both pieces of information may be available, in which case these problems may not arise.

14.13. In defining the subnational units, care must be taken to establish consistent geographical boundaries. For example, in several Latin American countries the ministry of health and the social security institution define subnational units differently. In such cases, geographical boundaries have to be reviewed one by one to ensure that the subnational entities are comparable.

Estimation procedures

14.14. As described above, subnational accounts can be compiled in two ways. They can be built bottom-up, where primary data compiled initially at the subnational level are aggregated at the national level. This method is most practical in countries where data collection is routinely done at the subnational level and where health financing is mostly decentralized. The subnational authorities must constantly interact with one another and with the central authorities to ensure that, whatever financing "intermediation" they use, whatever provision mode they use, whatever benefit package or health care basket is available at the regional level, the underlying classification and coding approaches are homogeneous. Years may be required before the aggregation of subnational accounts into a genuine bottom-up national aggregate emerges.

14.15. The second approach is to build the national estimates first, and then disaggregate these into subnational components, element by element. For some elements of spending, this requires only disaggregating data that were originally separate, and in other cases it requires development of distribution formulae to allocate elements to each subnational unit. Australia, the Philippines and Sri Lanka provide examples of this top-down approach. Other countries have used a combination of methods. For example, in Mexico, the public estimates are constructed in a bottom-up approach and private institutions are estimated top-down. The lack of detailed information may suggest that a top-down approach is advisable in the early stages before regional or local authorities have built up the necessary information network.

14.16. Where expenditure data are available on a regional basis, disaggregation is straightforward. For example, in a publicly funded hospital system, the expenditures for each facility may be known. It is then a simple matter to sum the expenditures of all facilities in a particular region to obtain estimates of public hospital spending. This procedure is common even in fairly centralized states that have devolved the implementation and the evaluation of their delivery and financing system. In some cases, similar data may be available on private facilities, for example when trade or professional associations collect data at regional level.

14.17. When expenditure data are not available on a subnational basis, the expenditures under consideration must be distributed using proxy variables as indicators of the likely distribution. Most often this proxy will be health personnel, as labour accounts for a large share of expenditure. If additional information exists regarding inputs, a sort of market basket can be developed as a distribution tool – a market basket is an aggregation of inputs, each weighted by a price measure (perhaps using regional prices). Of course, using proxy measures limits the conclusions that can be drawn from the results. For instance, when per capita data are used to construct one of the dimensions, nothing can be concluded about per capita distributions; when resource indicators are used, a productivity analysis may be meaningless.

14.18. Straight per capita distribution of spending should be used as a last resort. Real world observations suggest that health resources are not distributed exactly according to the population to be served, so the assumption of equal distribution per capita by region, as is often done in benefit incidence analysis, is unlikely to produce meaningful conclusions in terms of the equity, efficiency, or effectiveness of the financing flows observed. This assumption can, however, be used to initiate discussions with subnational authorities about spending in their jurisdiction until the latter develop a relevant monitoring and assessment tool.

14.19. Several countries use a proxy distribution. In Sri Lanka, a large part of public spending on medical supplies is concentrated in the central health ministry budget. This is used to purchase and distribute supplies to the provinces, which also have their own budgets for supplies. The central ministry does not maintain clear records of how its centrally procured supplies are distributed, so Sri Lanka's health accountants estimate the proportion assuming that the ratio between provincial and central spending on supplies in each province is the same for all provinces.

14.20. The use of any estimation formula involves considerable exercise of professional judgement. For this reason, as much consultation with central and regional experts as possible should be secured before work begins. For the same reason, the methodology used should be published to encourage feedback about alternative methods and improvements. No single approach has been proposed in this *Guide* because the nature, the form, the levels, the units and the purposes of subnational breakdowns are unique to each country.

A case study: Mexico

14.21. The methodology described here was applied for the 1995 round of the NHA in Mexico. At that time, decentralization was not fully developed and a large share of the expenditure on health incurred at the regional level was actually paid for through intragovernmental transfers (from central government). These resources were centrally reported and there was a lack of information for the supplemental expenditure that originated from subnational governments. This environment changed a few years later, as decentralization advanced. The expenditure records for the 1995 NHA were partial and heterogeneous. Subnational level accounts have recently been initiated through genuine state-level involvement.

14.22. A three-stage analysis was used to develop the Mexican regional health accounts. The first stage was an estimation of health expenditure at the national level. The procedure roughly followed that described in this *Guide*; total health expenditure was estimated mainly from public expenditure reports by function and from institutional administrative reports, complemented with resource cost information for the public and private entities, industry reports from the pharmaceutical and private medical insurance branches, household surveys (income expenditure survey and national health survey) and the system of national accounts estimates for public and private components. Tables developed included FSxFA, FAxP, FAxF, and FAxRC.

14.23. A second level of distribution was estimated by region or state. At this level, total expenditure on health was distributed to obtain total health expenditure per capita by component (public sector insured and non-insured population; and private sector). Also, a stratification of states by epidemiological transition was used. Information sources were basically administrative reports for most of the public institutions by function. These data were disaggregated to keep only expenditure on health and leave aside social support expenditure. There were a few cases (representing a small amount of expenditure) in which this information was not available at state level. That expenditure was distributed using the share of inpatient days by state, obtained from institutional reports of production and use of services. Many of the transactions were identified at state level as transfers and purchase of services among larger public institutions, including user fees or out-of-pocket expenditure. Private expenditure for non-profit organizations was estimated from a recent economic census (and adjusted using the price index and the share of those working in health activities within each state). Private (for-profit) entities were distributed at state level according to the share of these professionals registered by state in the economic census. Data gaps were filled and the overall results checked using pharmaceutical and medical private insurance data from industry and state-level health accounts produced for the previous year. Although the latter estimation was partial, it included ad hoc surveys and field visits to public institutions of each state. Household out-of-pocket expenditures were estimated by difference and triangulated using available data from state level distribution in the income-expenditure survey (with partial representativeness for some

states) and records of private medical personnel in some states. Distribution by function was established by cross-matching the results from two household surveys. This geopolitical distribution was not complete by state, but it was integrated by region.

14.24. A third level of expenditure, at the county or local level, was accomplished using an index based on the human resources, infrastructure and level of services provided. Because human resources represent the largest share, their weights were highest. Infrastructure was nevertheless a key component, in so far as where there is no infrastructure there are usually neither medical personnel nor services provided. These results were validated and approved by state representatives and some key private informants.

Distributing health spending among population groups

14.25. A key policy concern everywhere is the interpersonal distribution of health care resources, according to such characteristics as age and sex, socioeconomic status or region of residence. At present, there is no consensus on what constitutes equity — there are at least seven operational definitions, including equality of per capita contributions and benefits, proportional contribution from means, benefits proportional to needs, and equality of health status *(1)*. But however it is defined, without good information policy-makers cannot determine whether their country's system is moving towards equity.

14.26. Using NHA to help bridge this information gap is relatively new. Analyses have been conducted in Bangladesh, the Hong Kong SAR of China, the Dominican Republic, Ecuador, Egypt, Mexico, Nepal, the Philippines, Sri Lanka, and some of the OECD countries, among other places. Currently, however, there is no international standard for structuring this work, and experience remains variable.

14.27. Distributional analyses do not necessarily have to account for all of national health expenditure. For example, it is uncommon to use health accounts to review the equity of construction or research, and equity is not a concept that is easily applicable to administration. So, typically, a presentation of population distribution of health spending is restricted to personal health care spending, perhaps augmented by spending on public health activity. (See paragraphs 14.55 to 14.61 for a discussion of a way to look at the distribution of household funding of health care).

14.28. Calculating the distribution of health expenditures across individuals and households requires matching survey and microdata to the global expenditure estimates in a health account. In fact, NHA-based estimates of the distribution of health expenditures share much in common with the more established benefit incidence studies of health expenditures using microdata. The key difference is the combination of microdata with health accounts estimates of global expenditures *(10).* Benefit incidence studies, when examining the distribution of private expenditures, usually take as given the expenditures reported in the surveys used for the analysis. Health accounting approaches benefit from the more reliable measurements of such expenditures in the FAxP (or PxF or FAxF) tables, and use these to adjust survey data where necessary for under/reporting or over/reporting. In addition, health accounting approaches provide the option of analysing all health expenditures in a system, which is not the case in micro/studies. For these reasons, health accounting estimates of the distribution of health expenditures provide significant improvements in the reliability and comprehensiveness of distributional estimates, and more valid cross-comparability of estimates between public and private spending, and across countries *(11)*.

14.29. A current drawback is that survey and microdata are not found in all countries. Nevertheless, surveys and related instruments in more than a hundred countries have been identified. Although the list is not exhaustive, services include WHO (measurement of the fairness in financial contribution, World Health Surveys and construction of proto-NHA), the World Bank (Living Standards Measurement surveys

and the Poverty Initiative), and other international organizations not directly associated with this *Guide* (such as UNICEF, the United Nations Development Programme and the Economic Commission for Latin America and the Caribbean). It is clear that the potential to construct distributional tables is significant.

Scope of expenditures to be considered

14.30. The choice of which expenditure items to analyse is important. Many decisions or policies will be concerned with subsets of the ICHA-HC functional classification of expenditures. For example, proposed policies may focus on personal health care (HC.1 to HC.5). In this case, the advantage of the ICHA-HC is that it probably corresponds fairly closely to available microdata, at least at the one-digit level, and can be operationalized fairly easily in surveys. For example, most survey data permit separate treatment of inpatient and outpatient expenditures, and most household expenditure surveys distinguish between expenditures for physicians' fees and expenditures for medicines purchased from retail outlets.

14.31. There are other ways to look at population distributions of health expenditure and analysts must consider which types of distributions are needed in respect of which policy concerns. Some policy-makers may want to know how the services of different provider types are distributed among the population. They may even want to know how the resources of financing sources are distributed. In cases such as these, the ICHA-HP, ICHA-HF, or FS classification schedules are a more appropriate way to organize the analysis.

Defining the population dimension

14.32. In the absence of any international standards for this type of analysis, classifications may be nationally specific or may follow widespread international practice. Classifications should always reflect policy needs as well as practical feasibility. To use health accounts productively in analysing the population dimension, each classification scheme must be mutually exclusive and exhaustive — that is, each person is included once and only once in the classification. If the whole population is not included, it is impossible to take advantage of the "control totals" afforded by the FAxP, PxF, or FAxF tables. However, there is much experience from countries that have already undertaken this exercise that may help the development or adoption of relevant classification schedules.

14.33. *Age and sex.* Age groups should not be too broad. Data from several countries show that per capita health expenditures reach a peak in the 75–84 year age group, and decline afterwards *(12).* A useful approach is to use the standard age groups employed by the United Nations across a wide range of population-based studies: five-year or ten-year age groups, with the first year of life shown separately (although for clarity of exposition less detail may be shown in published results). Another option is to use age groups that have some epidemiological relevance; for example, 0–1 year, 1–4 years, 5–14 years, 15–44 years, 45–64 years, 65–74 years, 75–84 years, and 85 years or older. These age groups can be further divided between males and females. The key is to make sure that the structure provides mutually exclusive and exhaustive categories.

14.34. *Socioeconomic status.* When originally constructed, socioeconomic status applied to an entire household and reflected a combination of household income and the education and occupation of the head of the household. Over time, a number of measures and approaches have been discussed in the literature on equity in health, but the most common ones are measures of household per capita income or expenditure. These measures can be used to sort households into quintiles, deciles or other income groups that are of national priority. However measured, socioeconomic status should be established using the household – not the individual – as a basis.

14.35. Income is one of the most often cited measures of socioeconomic status, but it has definite drawbacks as a practical indicator. Income can be seasonally variable, and may not reflect long-term economic status. Income measures in some countries have additional problems, as households are reluctant accurately to report their true income to surveyors. Income is hard to measure in agrarian economies, in the absence of a market for activity. Wealth is probably a better indicator of household resources than is income, but measuring wealth consistently has proved to be enormously difficult, making its usefulness in health accounting doubtful; it is little used as a measure outside OECD countries.

14.36. For these reasons, many analysts prefer to use expenditure measures. Household expenditure itself poses problems as a measure to rank households, however, since it ignores household composition. For example, households of equal size and equal expenditures but differing in the number of children present would not be equally well off. A common solution is to use equivalence scales to adjust expenditures for the size and composition of households. An equivalence scale frequently used in high-income countries uses a weight of 1.0 for the first adult in a household, 0.7 for each additional adult, and 0.5 for each child when measuring per capita expenditure. Much of this research has been done in OECD countries, however, and there is no consensus on which equivalence scale is best for health expenditure in low-income and middle-income countries.

14.37. *Geographical residence.* Beneficiary analyses can be focused on the geographical distribution of expenditures. This is similar in intent to subnational accounts (discussed above) except that estimation of a complete set of accounts for each region is not the objective. Despite the difference, some of the steps will be the same, such as the disaggregation of public budgetary expenditures by region. Often, the interest is less in political subdivisions than in urban and rural distinctions.

Estimation procedures

14.38. To prepare a distributional table, microdata are needed that reveal the distribution of items of expenditure, or the distribution of the consumption of services by population groups. Typically, these come from nationally representative household surveys that contain information necessary to allocate individuals or households to the desired population categories and that also contain information on households' use of medical services and expenditures on health services. Sometimes this information is available from organized payers or purchasers, for example when those entities maintain records of health care consumption and expenditure for individuals.

14.39. Two key rules are important in populating the table. The first rule is that each item of expenditure included in the analytical domain should be fully allocated to the target population groups using the distributional information available in the microdata. For example, when physician expenditure is distributed among population groups, *all* of the spending identified as physician spending in the FAxP table must be allocated – no more and no less.

14.40. The second rule is that the microdata should be used only to derive the distributions of expenditure, not the actual levels of expenditures. Usually, microdata obtained from a survey do not match the data in the health accounts. This may result in part from expenditure categories reported in the survey that do not match the NHA classification schedule. More likely, however, is that the survey data do not capture all spending, for reasons outlined in Chapters 6 and 8. In this regard the health accounts totals are superior, because they may incorporate other sources of data and have subjected estimates of household spending to reasonableness checks through the table reconciliation process. The microdata contain information about who is the beneficiary of the expenditure, but the effort expended to create the FAxP, FAxF, and PxF tables has produced a more accurate measure of the total expenditure under analysis.

14.41. Applying the distribution of survey-reported spending among population groups to the health accounts totals implies several assumptions. These assumptions can, however, be summed up into one: the "error" in the survey is spread proportionately to spending among all the population groups. If this assumption is demonstrably false and some adjustments can be made to the survey data to correct for the disproportionate error, those adjustments should be made to the data before applying the distribution to the health accounts totals. For example, if lower-income populations are believed more (or less) likely to understate health spending, then the survey data could be adjusted to reflect that. These kinds of adjustments should be made very cautiously, however, as they can lead to accusations of distorting the analysis to suit some political agenda. There must be very strong theoretical reasons or practical evidence to support the adjustments before they are employed.

Creating an expenditure distribution table

14.42. Estimation of expenditure distributions often requires combining data on the distribution of spending for financing agents, providers and functions. For example, a common approach would require that three categories of expenditures be taken into account, each requiring a different approach:

- Household out-of-pocket spending on personal care;
- Expenditure for personal care funded by other entities;
- Expenditure for collective or community-level services.

Expenditure for other types of goods and services should also be considered, when these are included in the scope of the exercise.

14.43. *Household out-of-pocket spending on personal care.* To allocate these expenditures among population groups, household survey data are needed that associate household expenditures with the right person. When the classification schedule aggregates groups of individuals (for example, age groups), the microdata must record expenditures that can be associated with specific individuals in the household.

14.44. The computational steps are fairly simple. First the survey is tabulated according to the population groups chosen. Then the percentage distribution of those tabulated results is calculated. Finally, those percentages are applied to the health accounts total for household spending. For example, a household survey may report national spending by households for physician services as being 200 million national currency units (NCU), while the more reliable health accounts estimate is 350 million NCU. The distribution of spending by household expenditure quintiles is reported by the survey as being 20 million, 35 million, 40 million, 50 million and 55 million NCU, respectively. Accepting the health accounts figure as the appropriate control total, the 350 million NCU is distributed to the expenditure quintiles by applying to it the percentage distribution observed in the household survey. In this example, this would yield a quintile distribution of 35 million, 61 million, 70 million, 88 million and 96 million NCU, respectively.

14.45. This allocation should be performed at the lowest level of detail for which health accounts totals can be matched reliably with survey distributions. For example, if prescription drug spending can be separated from laboratory spending in both the accounts and the survey, it is better to treat each function separately than to combine the two. Not only does this usually result in more accurate results; working at a greater level of detail also affords more flexibility in the finished product, as the answer to one policy question often begets another question along the lines of "What if laboratory spending were dropped from the proposal?". Not having to rework the entire exercise saves time and money.

14.46. Advances in statistical techniques and in computer power have improved the tools available for this type of work. Clearly, results from different surveys can be used to distribute different categories of health spending. It also is possible in many cases to merge data from different surveys to create a more

powerful and informative estimation base. A simple example is merging two different surveys using households' income, members, socioeconomic status and residence as merging keys; but more sophisticated statistical procedures are feasible.

14.47. *Expenditure for personal care funded by other entities.* The procedure for allocating non-household spending on personal care to population groups is essentially the same as for household spending. That is, a percentage distribution from the microdata is used to attribute spending to each demographic group.

14.48. The procedure nevertheless involves important assumptions in addition to those described in paragraph 14.41 above. As these expenditures cover such things as publicly subsidized hospital services or insurance-funded health services, households are unaware of the amounts spent. Therefore, utilization data are reported instead of spending data. Use of utilization data to allocate spending requires assumptions about the mean expenditure per unit of utilization across people. For example, if it can be assumed that the expenditure on each unit of service is the same regardless of who receives it, then the distribution of usage can be applied directly to the total spending figure to allocate that spending. On the other hand, if the expenditure for one group's care is assumed to be twice as much as another group's care, then the distribution of usage must be adjusted to reflect that cost difference before allocating expenditures.

14.49. For example, in the case of publicly financed outpatient visits to a government hospital, the unit of measurement might be an outpatient visit. If it can be assumed that each outpatient visit involves the same public subsidy, then the share of these subsidies allocated to each population group will be equivalent to the group's share of outpatient visits. If one assumes that the services provided as part of outpatient visits differ in cost, then the visit counts must be adjusted to reflect that differential before constructing the percentage distribution.

14.50. The methodology described above has an advantage and a disadvantage. On the plus side, it is methodologically similar to most benefit incidence studies of the distribution of public subsidies. For this technique to be useful, however, the FAxF table must have been developed using a functional classification system that is consistent with the data reported in the survey. If this is not the case, then a compatible classification must be developed before proceeding further.

14.51. Again, it may improve accuracy to incorporate more disaggregated elements of spending than those published in the health account. For example, the health accounts may identify a global level of government subsidies for inpatient spending, but analysis suggests that inpatient spending in public hospitals differs systematically by type of hospital and by geographical area. If household data allow identification of use by type of hospital and by geographical area, then the unit of analysis should be the government subsidy for a particular type of hospital in a given geographical area, rather than the national total. An example of this procedure is reported for Egypt by Rannan-Eliya et al. *(11).*

14.52. A variant of this approach uses the fundamental identity equation E=PQ, where E is expenditure, P is price, and Q is quantity. When the information is available, the price of each service received by each population group is multiplied by the amount of services received. For public services, reports of use of health services are the principal source for measuring expenditure, as well as price data. Prices are not always equivalent to costs, however, which means that market failures such as subsidies may distort measurement. Cost information may be useful in such cases to adjust "posted" prices to more accurate measures of resource use. Private expenditure is usually obtained from household surveys and from partial data from specific industries — for example, the private medical insurance industry may have records of services paid by the insured population.

14.53. *Expenditure for collective or community-level services.* Collective or non-personal expenditures do not require microdata for distribution, since by definition they cannot be assigned to specific individuals. Examples include most public administration of health, regulatory activities and vector control programmes. These expenditures can be allocated on a per capita basis.

14.54. It is important, however, to specify the population over which the expenditures are distributed. Collective expenditures should be assigned equally to all relevant individuals who benefit from them. For example, a health education programme might be purely for the benefit of all women in the reproductive age groups, in which case such expenditures should be distributed equally among all women in those age groups. On the other hand, surveillance of water quality benefits all residents and should be allocated equally to each. (In theory, this latter notion could be applied to administration and construction spending, although policy-makers may be less interested in having those categories of spending included).[21]

Analysing the equity of health care funding

14.55. Distributing health care spending among population groups is a way of analysing the equity of expenditure in the provision of health care in a country. Another, complementary view of equity is from the standpoint of funding. Part of this analysis is performed when looking at how households as financing agents differ across income groups or other classifications. Looking at households as financing agents does not, however, imply ignoring their roles as financing sources through their payment of taxes and premiums.

14.56. One way of addressing this perspective is to use as a control total the household entry in the financing source vector of the FSxFA table plus households' contribution to government revenue. Viewed this way, households produce four streams of money: out-of-pocket spending; health insurance premiums; payment of general earmarked taxes; and employer taxes.

14.57. *Out-of-pocket spending.* The way to distribute out-of-pocket expenditure has been discussed earlier in this chapter and needs little further explanation. This is households' role as financing agent.

14.58. **Health insurance premiums.** Household payments to purchase voluntary medical insurance and employee contributions toward the purchase of group insurance policies can be traced back to households (as financing sources). The former payments are made directly by the household and require no additional assumptions. Contributions to group insurance premiums also are likely to be identifiable as a contribution per worker. Additional assumptions may be needed to align those workers with the population categories being used.

14.59. *Payment of general and earmarked taxes.* To allocate general and earmarked taxes requires somewhat more data than are needed to populate the NHA itself. A breakdown of government general revenue between personal taxes and business taxes is needed. Those proportions are applied to the government source total, after adjusting for earmarked taxes, the origin of which is presumably known. To further allocate the personal tax share of general revenue among households, some information must be known about the overall tax burden by income quintile (or whatever categorization is being used). Earmarked taxes, such as payroll taxes, can be distributed among population groups in proportion to the basis of the tax itself (such as wages and salaries).

[21] It is important to carry through this same distinction when interpreting the distribution of collective goods and services. Using total population to calculate per capita figures will be misleading for functions or services applicable to subsets of the population. For example, dividing spending for immunization programmes for children by total population produces a false description of the intensity of the programme — it is not only more appropriate but also more descriptive to divide the spending by the number of children in the country. Thus, tables showing per capita amounts may have different denominators for each line, which must be noted in the table and in accompanying explanations.

14.60. *Employer taxes.* In the SNA93, employer tax payments are imputed to households, but in the NHA they are attributed to employers. Following the economic theory that underpins the SNA treatment, employers view wages and payroll taxes as fungible parts of employee compensation. Following this argument, it is appropriate for this exercise to impute those taxes back to households, again on the basis of wages and salaries, or per head, or on whatever basis the tax is levied.

14.61. Some agree that the entire burden of health care spending from domestic funds eventually rests on households, whether through lower wages, higher prices, higher taxes, or outright purchases. Following this logic, the cost of employer health insurance premiums and even of on-site health care provision could be imputed back to households. Whether this is done depends greatly upon the policy purposes for which the analysis is being prepared.

A case study: distributing spending among income quintiles in Appia

14.62. The Appian government has expressed a strong interest in seeing how health spending is distributed among the population, especially among socioeconomic cohorts of the population. Therefore, this is the first of the distributional tables to which the team turns its attention.

14.63. First, the team decides to use household expenditure to define socioeconomic status. There are several reasons for this choice. From a theoretical perspective, expenditure is more likely to reflect the total purchasing power of a cohort than is income, as it reflects both "permanent income" and the consumer power that comes from wealth. From a practical perspective, there are only two comprehensive measures available — income and expenditure — and the Appia consumer survey produces results that are much more robust in terms of consumption than income. (Expenditure and income are not reported the same by households, if for no other reason than the existence of incurred debts and dissavings).[22]

14.64. Regrettably, there is no detailed health survey under way in Appia. The team begins consultations with the Statistical Agency and with potential external organizations to see whether such a survey could be mounted. In the meantime, it must proceed with what is available to it.

14.65. The Statistical Agency produces a second tabulation of results from the household survey, broken out into the five quintiles of consumption (see Exhibit 14.1). By convention, Q5 is used to refer to the 20% of the population with the highest consumption, and Q1 refers to the 20% with the lowest consumption. The NHA team also requests a tabulation of income and of industry of employment of the household head, both of which are collected in the household survey.

[22] Classic economic term for dipping into principal or drawing on savings.

Exhibit 14.1 Appia: special tabulation of household survey
Calendar year 2002 (millions of crowns)

Category of household expenditure	Total	Q5	Q4	Q3	Q2	Q1
National Insurance Agency	11 626	1 628	2 209	2 674	2 500	2 615
Payments to private medical insurance	4 400	1 804	924	660	572	440
Co-payments at hospitals	13 643	9 687	3 547	136	136	137
Co-payments at polyclinics	11 965	3 590	2 991	2 393	1 795	1 196
Purchase of prescription drugs	41 042	9 440	9 029	8 619	8 208	5 746
Payments to other health practitioners	19 763	5 388	4 434	3 678	3 186	3 077
Total	102 439	31 537	23 134	18 160	16 397	13 211
Percentage distribution	*100.0%*	*30.8%*	*22.6%*	*17.7%*	*16.0%*	*12.9%*
Household income	2 901 426	874 593	717 258	613 140	441 924	254 511
Wages and salaries	2 137 893	458 120	509 022	509 022	407 218	254 511
Other	763 533	416 473	208 236	104 118	34 706	0
Population by industry of head of household						
Agriculture, forestry, fisheries	81 876	2 456	13 919	20 469	22 107	22 925
Mining	16 376	2 129	2 620	5 076	4 913	1 638
Manufacturing	24 563	8 106	9 088	4 913	1 228	1 228
Trade	22 517	15 311	3 828	2 252	1 126	0
Services	12 281	6 018	3 684	1 351	1 228	0
Government	4 094	1 433	1 433	819	409	0
Unemployed	24 563	0	0	1 474	8 351	14 738
Retired	18 423	5 527	6 448	4 606	1 474	368
Total	204 693	40 980	41 020	40 960	40 836	40 897

Source: Special tabulation from Appia Statistical Agency (Household Budget Division), dated 26 May 2003.

14.66. First the team looks at household spending and creates the worksheet shown in Exhibit 14.2. Because the total figure for spending on pharmaceuticals matches the figure in the FAxP table, the team has no difficulty transferring the quintile split from the household survey. Similarly, although the survey figures do not match the NHA figures for co-payments at hospitals and polyclinics, there is no reason to assume that the differences are disproportionate by socioeconomic status group; so the team applies the survey percentage breakdown to the health accounts totals.

Exhibit 14.2 Appia: worksheet for determining household as financing agent distribution, 2002

	Source	Total	Distribution				
			Q5	Q4	Q3	Q2	Q1
a Prescription drugs	Survey	41 042	9 440	9 029	8 619	8 208	5 746
b	NHA	41 042	9 440	9 029	8 619	8 208	5 746
c Co-payments in hospitals	Survey	13 643	9 687	3 547	136	136	137
d Distribution		100%	71%	26%	1%	1%	1%
e	NHA	14 414	10 234	3 747	144	144	145
f Co-payments in polyclinics	Survey	11 965	3 590	2 991	2 393	1 795	1 196
g Distribution		100%	30%	25%	20%	15%	10%
h	NHA	9 647	2 895	2 412	1 929	1 447	964
i Other health practitioners	Survey	19 763	5 388	4 434	3 678	3 186	3 077
j Traditional healers	Study	100%	2%	8%	15%	32%	43%
k	NHA	5 498	110	440	825	1 759	2 364
l Physicians	i-k	14 265	5 278	3 994	2 853	1 427	713
m Distribution		100%	37%	28%	20%	10%	5%
n	NHA	11 572	4 282	3 240	2 314	1 158	578
o Household financing agent spending (tentative)		82 173	26 961	18 868	13 831	12 716	9 797

14.67. The figure for "other health practitioners" poses more difficulty, as the team suspects that patterns of spending by quintile for physician services and for traditional healers are quite different. Fortunately, a sociologist at the Appia University has recently completed a study of the use of traditional healers, and while the study offers no insight into total spending the author produces findings on the orders of magnitude of spending by various income groups. The team builds the traditional healer distribution into its estimates, which allows a spending pattern for physician services to emerge. That pattern conforms to the generally accepted notion that private physician services are used more by upper-income patients than by lower-income patients. Although the level does not agree with the health accounts (because of the presumed double count of services reimbursed by insurance or by firms), the team uses the distribution to allocate the NHA figure among socioeconomic status quintiles. This concludes a first pass through the households as financing agents.

14.68. Some of the remaining financing agents can be handled with relative ease. For example, the only external organization activity is the programme run by Doctors without Borders, which is targeted at people in the lowest economic stratum of the country. The Ministry of Defence spending is only for military personnel and their dependants, and military wages place these people in the second-lowest socioeconomic status quintile. There are no data on use of firms' on-site facilities, but the numbers are small enough that the team decides to allocate them to quintiles according to the number of nongovernmental non-agricultural employees and dependants in each quintile (see Exhibit 14.3).

Exhibit 14.3 Appia: worksheet for expenditure distribution by employers as financing agents, distribution, 2002

	Source	Total	Distribution				
			Q5	Q4	Q3	Q2	Q1
Spending	FA x P	4 293					
Nongovernmental, non-farm employees and dependants	Household survey	75 737	31 564	19 220	13 592	8 495	2 866
Percentage distribution		100.0%	41.7%	25.4%	17.9%	11.2%	3.8%
Allocated spending		4 293	1 789	1 089	770	482	163

Note: includes the national electricity utility, AZap

14.69. To allocate spending of other financing agents, however, requires a look at the various providers. Total hospital days are available from the institutions themselves, which is a helpful start. Of enormous assistance is a Ministry of Health white paper completed the previous year, which analysed the effects of privatization on the use of hospital facilities by income quintiles. A sample of hospital admissions at each type of hospital was studied, eliciting not only who funded the admission but also the household income of the patient.

14.70. The team uses the white paper results (see Exhibit 14.4), assuming that the difference between income quintiles and expenditure quintiles in this regard is not significant. It also assumes that the subsidy payments from regional governments and from nongovernmental organizations are split proportionately to total inpatient days. This produces an allocation of total hospital inpatient spending among the groups, which is presented in Exhibit 14.5 (see pages 240 and 241). At the same time, the split between groups helps to refine the household division of hospital co-payments, as it is known that the National Insurance Agency limits its per diem payment to private hospitals to 3.67 times the average in regional hospitals and that patients must pay the rest out of pocket.

Exhibit 14.4 Appia: Ministry of Health white paper on the effects of privatization on use of hospital services, 1996–1998

Distribution of days by type of facility and income quintile

	Total	Quintile distribution				
		Q5	Q4	Q3	Q2	Q1
Ministry of Health	100%	3%	25%	30%	26%	16%
Regional	100%	11%	17%	24%	24%	25%
Private	100%	70%	30%	0%	0%	0%

Exhibit 14.4 Appia: Ministry of Health white paper on the effects of privatization upon use of hospital services, 1996–1998 (continued)

Distribution of inpatient days by facility type, payer and income quintile

	Total	Quintile distribution				
		Q5	Q4	Q3	Q2	Q1
Ministry of Health hospitals		100%	100%	100%	100%	100%
National Insurance Agency		100%	100%	100%	73%	39%
Ministry of Health		0%	0%	0%	27%	61%
Regional hospitals		100%	100%	100%	100%	100%
National Insurance Agency		99%	99%	99%	56%	46%
Government insurance		1%	1%	1%	1%	0%
Ministry of Health		0%	0%	0%	44%	54%
Private hospitals		100%	100%			
National Insurance Agency		98%	97%			
Private insurance		2%	3%			

14.71. A similar type of estimation process is needed to disaggregate polyclinic and other types of spending for health care among the five quintiles of the population. Hospital outpatient spending is distributed among the groups using a method that includes the hospital co-payment allocation reported in the household survey. (For the sake of brevity, these methods are not shown here.)

14.72. To finish the allocation of spending among the population quintiles, the team turns to public health activity and administrative costs. It spreads the former among the groups on a per capita basis. The administration expenses (where applicable) of each financing agent are spread among the quintiles in proportion to the quintiles' share of the financing agent benefits (no attempt is made to split administrative costs among the ICHA-HC functions). These data are reported in Exhibit 14.6.

Exhibit 14.6 Appia: administration worksheet
Calendar year 2002 (millions of crowns)

Financing agents and providers	Total	Distribution				
		Q5	Q4	Q3	Q2	Q1
Ministry of Health						
Hospital inpatient	4 108	0	0	0	1 798	2 310
Hospital outpatient	3 014	0	0	0	1 206	1 808
Polyclinics	6 473	0	0	0	2 589	3 884
Orphanages	218					218
Public health	5 262	1 052	1 052	1 052	1 052	1 054
Subtotal	19 075	1 052	1 052	1 052	6 645	9 274
Percentage distribution		5.5%	5.5%	5.5%	34.8%	48.6%
Administration	3 365	186	186	186	1 172	1 635
Total	22 440	1 238	1 238	1 238	7 817	10 909

Exhibit 14.6 Appia: administration worksheet (continued)
Calendar year 2002 (millions of crowns)

Financing agents and providers	Total	Distribution				
		Q5	Q4	Q3	Q2	Q1
Regional government						
Hospital inpatient	23	3	4	5	5	6
Hospital outpatient	18	4	4	4	4	2
Polyclinics	521	104	104	104	104	105
Public health	726	145	145	145	145	146
Subtotal	1 288	256	257	258	258	259
Percentage distribution		19.9%	20.0%	20.0%	20.0%	20.1%
Administration	56	11	11	11	11	12
Total	1 344	267	268	269	269	271
National Insurance Agency						
Hospital inpatient	25 071	8 436	6 751	5 034	2 999	1 851
Hospital outpatient	6 629	1 989	1 657	1 326	994	663
Visiting nurse	471			271	200	
Polyclinics	22 148	6,645	5 537	4 430	3 322	2 214
Subtotal	54 319	17 070	13 945	11 061	7 515	4 728
Percentage distribution		31.4%	25.7%	20.4%	13.8%	8.7%
Administration	6 518	2 048	1 673	1 327	902	568
Total	60 837	19 118	15 618	12 388	8,417	5 296
Government insurance						
Hospital inpatient	60	8	17	19	16	0
Hospital outpatient	49	17	17	10	5	0
Polyclinics	402	141	141	80	40	0
Subtotal	511	166	175	109	61	0
Percentage distribution		32.5%	34.2%	21.3%	11.9%	0.0%
Administration	52	17	18	11	6	0
Total	563	183	193	120	67	0
Private insurance						
Hospital inpatient	508	299	209	0	0	0
Hospital outpatient	52	31	21	0	0	0
Physicians	2 640	1 320	792	396	132	0
Polyclinics	1 236	742	494	0	0	0
Subtotal	4 436	2 392	1 516	396	132	0
Percentage distribution		53.9%	34.2%	8.9%	3.0%	0.0%
Administration	974	525	333	87	29	0
Total	5 410	2 917	1 849	483	161	0

Exhibit 14.6 Appia: administration worksheet (continued)
Calendar year 2002 (millions of crowns)

Financing agents and providers	Total	Distribution				
		Q5	Q4	Q3	Q2	Q1
Nongovernmental organizations						
Hospital inpatient	238	167	71	0	0	0
Hospital outpatient	25	15	10	0	0	0
Physicians	286	0	0	0	143	143
Public health	1 893	379	379	379	379	377
Subtotal	2 442	561	460	379	522	520
Percentage distribution		23.0%	18.8%	15.5%	21.4%	21.3%
Administration	216	50	41	34	46	45
Total	2 658	611	501	413	568	565

14.73. This completes the Appia team's work on the distribution of health care spending among the five socioeconomic quintiles — at least for this cycle of the health accounts. The final distributional table is shown in Exhibit 14.7 (see page 242). In the next cycle, the team hopes to have begun a more detailed health expenditure survey that will provide information on the use of services from the various providers defined in the accounts, lessening the imputation burden on the team and strengthening the estimates. Continued discussions with colleagues in the Statistical Agency and in the university are also expected to yield refinements in the way in which data can be combined to complete this table.

A case study: distributing health expenditure by age and sex in the Netherlands

14.74. The methodology described for the Netherlands presents the distribution of expenditure on health by age, sex and diagnostic group *(13)*. The approach is a top-down, cross-sectional procedure applied to direct medical costs.

14.75. Total expenditure on health was already available. Homogeneous health care groups were created from already existing classifications used to estimate total health expenditure. These groups were linked to expenditure subtotals. For each component, a key variable linked to production and cost of services was selected. For example, for inpatient care the variable was bed days. These key variables were measured for each age, sex and diagnostic group. The share of that specific key variable was applied to the relevant expenditure subtotal. Information sources were clinical cost studies and institutional records. The procedures followed to develop further distributions are listed below.

- Hospital costs were split as nursing costs, costs of medical procedures, and costs of outpatient care (based in a specific hospital).
- Inpatient costs were distributed by number of bed days and day cases (the information available did not allow any distinction to be drawn between expensive and low-cost inpatient care).
- Medical procedures were classified by age, sex and diagnosis, and were grouped in 1000 components, weighted by their fees.
- Outpatient costs were distributed from diagnosis and patient referrals in a large sample of general practitioners, taking account of the number of visits.
- Nursing home costs were distributed by bed days (information was available by age, sex and diagnosis).
- A regional primary care registry was used to allocate costs of general practitioners; information on outpatients was also available.
- The costs of dental care were distributed based on a survey (the National Health Survey) and the

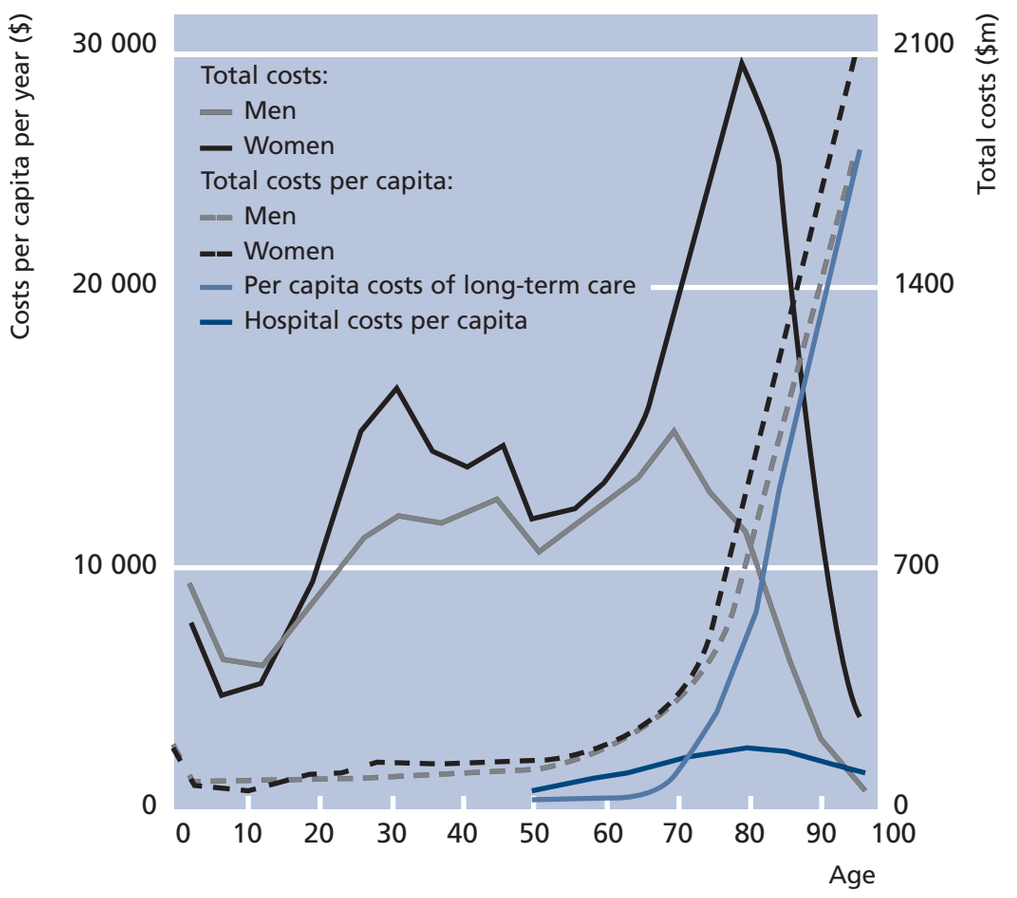
remuneration fees.

- Distribution of the costs of outpatient midwife and maternity care was based on registries by age and sex.
- Transport firms have a registry for the costs of ambulance services.
- Household care data were available, by age and sex, from the agency that supervises social insurance.
- Outpatient medication was traced through a database of prescriptions by a sample of general practitioners; along with diagnosis costs and age and sex of the recipient, the information included a classification of the prescribed product by use (anatomical, therapeutic, chemical).
- Aids and appliances were related to the prevalence of disabilities and diseases for which they are relevant.
- Health care administration was assumed to be proportionally distributed among groups.

14.76. A distribution by age and sex is presented in Figure 14.1, by 10-year intervals. The available data can, however, be shown annually and regrouped according to cost, epidemiological factors or social status.

Figure 14.1

Total and per capita health care costs by age and sex for hospital and long-term care in the Netherlands, 1994.



Note: Long-term care includes nursing homes, old people's homes, institutional care for disabled people, and appliances to assist disabled people.

Source: Meerding WJ et al. Demographic and epidemiological determinants of healthcare costs in Netherlands: cost of illness study. BMJ 1998, 317:111–115. (available at www.bmj.com).

Classifying expenditures by health status or intervention

14.77. In addition to concerns about spending on various health functions, policy-makers want to know about spending for various health problems, disease groups or intervention clusters. In general, these concerns will be restricted to expenditures for personal health services, rather than to all of national health expenditures. Although there is considerable interest in the dimensions of spending on personal health services, there are as yet few accepted international standards for reporting such health service activity and outcomes, and little experience in estimating related expenditures. The procedures in this chapter are based on rather limited applications.

Classification aspects

14.78. Typically, some adaptation of the International Classification of Diseases (ICD) is used for this type of analysis. The ICD comprises several thousand entries, grouped into chapters; other aggregations of ICD codes have been created, such as the burden of disease groups.

14.79. Caution must, however, be exercised when applying the ICD (or any other) classification scheme. There will always be uneven implementation examples of any coding system across countries. In addition, the question of how to treat patients with multiple health problems is complex because the most important cause of morbidity from a medical perspective may not be the one that is responsible for incurring a majority of the costs.

14.80. A limitation of the ICD for use in health accounting is that it was primarily developed as an epidemiological tool for classifying mortality. As a result, it is weak for those personal health service expenditures that cannot be categorized by disease. The ICD system is most relevant for classifying expenditures in the inpatient setting, but is applied with difficulty to patients who use providers for reasons of counselling, investigation without definitive diagnosis, medico-legal matters, screening or simple reassurance.

14.81. Variants of the ICD classification include schedules that group medical events by case-mix (often referred to by the name of the measurement tool used: diagnosis-related groups, health-related groups, homogeneous disease groups). Such systems of classification are based on homogeneity of resources required, and because of the research that underlies them they can provide more information about health costs than would a simple grouping of diagnoses. These systems may, however, present the same challenge to a health account as the ICD, principally that of the number of categories involved. Empirical explorations under way include reconsolidation of these codes into disease burden clusters: communicable, noncommunicable, and injuries.

14.82. Partly to address the limitations of the ICD, some analysts use the International Classification of Primary Care (ICPC). The ICPC, the most current version of which is ICPC-2, categorizes primary care activities. For this reason, it is the most appropriate system to use when distributing expenditures on primary care. Unfortunately, few countries have succeeded in instituting recurrent and systematic reporting of ambulatory care activity by purpose.

14.83. When the goal is not a comprehensive accounting of all personal health service expenditures, but rather measurement of selected expenditures for a specific purpose or type of care, the task of classification is easier. In this case, categories of expenditures are defined in terms of the ICHA-HC classification, or whatever coding system is being used in the main health accounts. For example, studies of the Egyptian, Sri Lankan, *(14)* and Brazilian health systems focused on reproductive health expenditures (see Table 14.1). Although there are differences among the studies in how reproductive health is defined, each study

framed the analysis in terms of all or part of selected expenditure items in the function classification system. For example, some inpatient care was included - the portion of expenditures that was related to admissions of women for obstetric or gynaecological purposes - and all expenditures for family planning were included.

Table 14.1 Spending in the Brazilian universal health system on selected outpatient procedures in reproductive health care, 1995–1997 (currency of 1997)

Provider	1995	1996	1997	1997 reproductive health expenditure (percentage)	Percentage increase in 1995–1997
Total outpatient expenditure	**3 410 100**	**3 664 969**	**3 912 293**		**14.7**
Reproductive health expenditure	**120 180**	**133 579**	**140 794**	**100**	**17.2**
Control of gynaecopathies	69 832	74 706	75 091	53.3	7.5
Cancer prevention	35 973	40 839	46 241	32.8	28.5
Antenatal care	13 467	17 031	18 541	13.2	37.7
Family planning	447	517	514	0.4	14.8
Delivery and puerperum attendance	461	486	407	0.3	-11.7

Source: CD-ROM DATASUS, 1999.

Estimation procedures

14.84. Estimation methods resemble those developed earlier in this chapter for population groups. As with those, feasibility will depend on the availability of microdata on health service use. In many countries, inpatient data are available at least for publicly funded services, but in many instances data for outpatient services will not be routinely available. Special surveys will then be necessary. If microdata are available (and technological advances steadily bring such data closer within reach of low-income and middle-income countries), the general approach should be to identify items of expenditure in the primary health accounts, and then to use the microdata to apportion these to the desired disease or treatment categories. The principles of apportionment would be similar to others discussed later in this chapter. For example, inpatient expenditures might be allocated to disease groups according to the relative share of inpatient bed-days if actual cost data are not available. Box 14.1 presents an example from Rwanda.

Box 14.1
Flow of HIV/AIDS monies in Rwanda

As part of the 1998 Rwanda health accounts report, two tables were developed to show the flow of HIV/AIDS monies, from financing sources to financing agents and from financing agents to providers.

Rwanda health accounts: HIV/AIDS table showing financing sources to financing agents 1998/9
(thousands of Rwandan francs)

Financing agents	Financing sources				Distribution (percentage)
	Ministry of Finance	External Organizations	Household out-of-pocket spending (1999)	Total	
Ministry of Health	27 878			2 ,878	0.9%
National AIDS programme		141 091		141 091	4.5%
Local nongovernmental organizations and churches		35 119		35119	1.1%
Out-of-pocket spending by households			2 947 308	2 947 307	93.5%
Total	27 878	176 210	2 947 308	3151 395	100.0%
Distribution (percentage)	0.9%	5.6%	93.5%	100.0%	

Rwanda health accounts: HIV/AIDS table showing financing agents to uses, 1998/9
(thousands of Rwandan francs)

Providers	Financing agents					Distribution (percentage)
	Ministry of Finance	National AIDS programme[a]	Local non-governmental organizations, churches	Household out-of-pocket spending (1999)	Total	
Ministry of Health outreach programmes	27 878	155 905			183 783	5.8%
Ministry of Health referral hospitals				934 319	934 319	4.5%
Ministry of Health centres				945 300	945 300	30.0%
Church health centres				945 300	945 300	30.0%
Private clinics				122 388	122 388	3.9%
Unaccounted funds		-14 814	35 119		20 305	0.6%
Total	27 878	141 091	35 119	2 947 307	3 151 395	100.0%

[a] Corrected figures.
Source: Schneider P et al. Rwanda national health accounts 1998. Partnerships for Health Reform Working Paper, September 2000, page 60.

14.85. When creating this type of table, it is again absolutely essential that the classification groups be mutually exclusive and exhaustive. That is, each unit of analysis (whether it be inpatient day, outpatient visit, pharmaceutical prescription, or person) falls into one and only one category. This is true of any of the classifications used in health accounting, but poses particular challenges in a distributional analysis. The "exhaustive" requirement is straightforward enough: if a percentage distribution is based on only a subset of the cases for which expenditure was made, the excluded cases are in effect assigned zero cost — which is patently untrue and which distorts the results. The mutually exclusive condition is more difficult to resolve. For example, people with diabetes often suffer vision problems as a result. So "the cost of diabetes" might be construed to include those vision problems. But if there is also a category called "vision problems", the potential for the vision-related treatment of diabetics to be counted twice in the percentage distribution is high. A classification schedule must be developed, in consultation with policy analysts, that eliminates such categorical overlaps. For example, a decision rule may be implemented that, say, if patient records include three diagnoses, the first diagnosis determines the disease category. Or a hierarchical classification may be created to categorize transactions. For example, any events where there is a diagnosis of diabetes are grouped together; of those that remain, any events with a diagnosis of heart disease are grouped together. Of those that remain, any with pulmonary disease are grouped together, and so on. Whatever classification scheme is chosen, care should be taken to ensure that it meets the needs of policy-makers and that it is explicitly and prominently described to users of the results. The remainder of this chapter presents two case studies illustrating how estimates have been produced to help policy-makers in Spain and in Egypt.

A case study: expenditure by health status in Spain

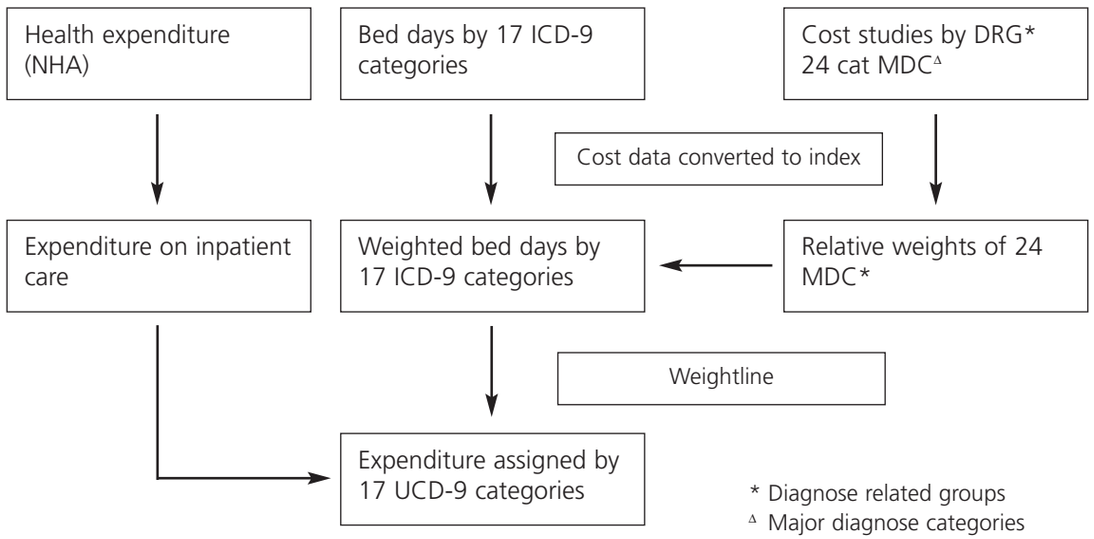
14.86. The process of distributing health expenditure by health status in Spain involved a top-down approach *(15)*. Total expenditure on health was already available; techniques were needed to break that figure down for various categories of disease (classified using ICD-9 groupings). The following steps outline the strategy developed by the health accounts team. Data sources were primarily clinical records, cost studies, pharmaceutical market records and reports of production of services (bed-days, medical visits, ancillary services and prescriptions).

14.87. Total expenditure on health was divided into four homogeneous groups: inpatient care; outpatient care; pharmaceuticals; and the rest of interventions. These groups are not standard but in Spain were considered both feasible to handle and to have clinical and economic relevance. They can be created from the classifications that already exist in the NHA tables (both for the public and the private sectors).

14.88. Expenditure was distributed into each of the four groups according to ICD-9 diagnosis categories. The results were validated using statistical records from several medical establishments and through discussions with key informants. The general procedure was adjusted to take account of the availablity of background material and of the particular characteristics of each category.

14.89. To avoid distorting the distribution, components of very high-cost procedures (such as those for the treatment of AIDS and for mental health care) were removed from the NHA totals. After the remaining money had been distributed, these components were added back in (see Figure 14.2).

Figure 14.2
Distribution of expenditure on inpatient care in Spain



14.90. All bed-days were analysed by ICD-9 groups to identify their frequency. Those frequencies were weighted using a resource consumption index. Complementary and secondary services (such as laboratory and imaging) were handled separately. Bed-day costs were taken from studies of related diagnostic groups and major diagnosis categories. Information on bed-day frequencies and their weights by resource use was combined to build a percentage distribution to be applied to expenditure on inpatient care. Finally, the previously segregated high-cost categories were added back in.

14.91. Pharmaceutical expenditure was distributed using industry sale records by product, and then allocated. Distribution was initially done by group and then by diagnosis when the use of pharmaceuticals was clearly related to a specific ICD group (for example, treatment of diabetes). Pharmaceuticals without an exclusive use were distributed according to the weight of the potential distribution in each group. A prescription profile, for example for analgesics, was estimated on the basis of clinical records and information from key informants. When there was no information on which to base a distribution professional judgement and average weights were used. These estimates were then validated using a small-scale sample of clinical records in selected units and through discussions with key informants.

14.92. Outpatient care was initially divided into the profile of services offered by public and private entities, such as primary health care, traditional model, reformed model, extrahospitalary care and outpatient centres. As in the case of inpatient care, the initial step was to distribute the total outpatient expenditure in these major homogeneous groups. Instead of bed-days, the unit of measurements was the visit. A distinction was made between home visits and visits to laboratories or for imaging and specialized care. As in the case of inpatient care, information was not always available. Nursing visits were not taken into account because of lack of information.

14.93. All these activities were linked to cost information to create weighted indexes. For each ICD-9 group and diagnosis, an estimate was made, where feasible, of the rate of visits by class (home, laboratory, etc.). The utilization and clinical records, and available cost studies were used to weight the

quality of services provided and were applied to the amounts estimated in each ICD-9 group. Some of the weight factors were estimated as follows:

- Visit to a general practitioner 1
- Home visit by general practitioner 2.2
- Paediatric visit 1.4
- Home visit by a paediatrician 2.9
- Visit to a specialized practitioner 1.2
- Laboratory visit 0.2
- X-ray and diagnositc imaging visit 2

A case study: expenditure on pharmaceuticals in Egypt

14.94. The share of total health spending on pharmaceuticals is one topic of particular interest to policy-makers. The following example shows how this was done in Egypt. It is reproduced verbatim from a 1997 report on the Egyptian health accounts for 1994–1995 *(16).* Material in square brackets [ ] has been added to clarify points made.

> "The Drug Policy and Planning Center (DPPC) of MoHP [Ministry of Health and Population] has established and maintains a national drug information system, which depends on mandatory reporting of all drug sales by pharmaceutical companies. This system, which has been in existence since 1986, tracks imports, production and sales of all drugs by company and individual pharmaceutical product. Table 2.31 [reproduced as Table 14.2] gives the DPPC estimates of trends in the pharmaceutical market during FY86-96. During this period, total pharmaceutical consumption and prices increased greatly in nominal terms. However, in real terms there was only a modest increase in actual price levels and sales volumes.

Table 14.2 Egypt: pharmaceutical sales, financial years 1986–1996

Financial year	Retail value (LE millions)	Volume (units)	Average unit price (LE)	Average unit price (constant FY90 LE)	Change in retail value (%)	Change in volume (%)	Per capita consum-ption (LE)
FY86	778.1	705.0	1.10		-	-	16.5
FY87	954.0	773.9	1.23		23	10	19.8
FY88	1094.2	821.4	1.33		33	6	22.1
FY89	1217.8	840.7	1.45	1.71	11	23	24.8
FY90	1395.1	822.8	1.70	1.70	15	-2	27.3
FY91	1766.6	844.5	2.09	1.83	27	3	32.8
FY92	1988.5	771.8	2.58	1.88	13	-9	41.0
FY93	2270.7	859.1	2.64	1.75	14	11	40.1
FY94	2738.9	890.3	3.08	1.91	21	4	47.4
FY95	3134.4	942.2	3.32	1.84	14	6	53.1
FY96	3479.3	1010.2	3.44		11	7	57.8

Source: Drug Policy and Planning Center, Ministry of Health and Population, Egypt. Reproduced from: (see p.14–120)

"DPPC sales data are for all pharmaceutical products sold legally within the Egyptian domestic market. This includes prescription-only medicines (in Egypt restricted only to opiates and a few other products), as well as over-the-counter (OTC) products, which comprise the vast bulk of sales. Vaccines are not included, as they are regulated separately. Sales are valued at retail price in the case of sales to pharmacies, and at the actual price paid for sales to institutional purchasers, such as MOHP, HIO [Health Insurance Organization] and universities. This latter price is typically less than the retail price, because of discounts offered to large buyers and for tender contracts.

"For NHA purposes, it is necessary to derive an estimate of total pharmaceutical sales to households, but DPPC does not collect data on the market share of the various types of purchasers, or the percentage share of each distribution channel. Nonetheless, three different estimates can be made of the percentage of pharmaceuticals distributed through pharmacies to households:

"1. Using a sample survey approach, [a private pharmaceutical analysis company] estimates that pharmacies accounted for 84% of total distribution in 1995.

"2. During the first round of NHA estimates, a survey was carried out by DOP of the 25 largest pharmaceutical companies, and this revealed that approximately 70% of total drugs sales at wholesale value were made to the private sector, which is essentially pharmacies. There was a 40% discrepancy between these sales figures (at wholesale prices) and those of DPPC, which can be explained by the valuation of pharmacy sales at retail prices in the DPPC data. If private sector sales for FY92 are adjusted for this retail margin, then the DOP survey data are consistent with an 80% share of distribution being accounted for by pharmacies.

"3. MoF [Ministry of Finance] audited accounts for governmental and public sector organizations detail Chapter 3 [part of the Egyptian health care financing system] expenditures by organizations. In the case of MoHP, MoF estimates that drug purchases account for 40–45% of total Chapter 2 [another part of the Egyptian health care financing system] expenditures. If it is assumed that other governmental health care organizations have a similar pattern of expenditures, then an estimate can be made of total public sector purchases of pharmaceuticals. In the case of HIO, this is not necessary, as their Annual Report contains sufficient information to directly determine its total drug purchases in the wholesale market. Defence Ministry facilities typically purchase drugs directly from pharmacies, without engaging in tenders or bulk purchases, so it can be ignored in this analysis. Table 2.32 [reproduced as Table 14.3] gives the estimates of drug purchases than can be derived from this procedure. It implies that total institutional purchases are in the range of LE [Egyptian pounds] 555 millions, which would imply that pharmacy sales account for LE 2579 millions, or 82% of total sales as recorded by DPPC.

"The three different estimates described above are all consistent in suggesting that pharmacy sales account for 80-84% of total pharmaceutical sales. This implies that total pharmacy sales in FY95 amounted to LE 2510–2633 millions."

Table 14.3 Egypt: estimation of public sector drug purchases in financial year (FY)95
(millions of Egyptian pounds [LE])

Organization	Chapter 2 expenditure	Estimated drug purchaes
Min.of Health and Population (MoHP)	438	186
University hospitals	225	96
Teaching Hospital Organization	31	13
Heatlh Insurance Organization (HIO)	n.a.	193
Curative Care Organizations	~276	117
Total (including vaccines)		605
Total (excluding vaccines)		555

Note: Drug expenditures estimated as 42.5% of Chapter 2 expenditures, except in case of HIO. Figures for HIO here are only for HIO own-pharmacy purchases; HIO finances an additional LE 237 millions in drug purchases from private pharmacies. Final total adjusted for inclusion of vaccines in MoHP drug purchases by subtracting estimated value of vaccine purchases, which is LE 50 million. Reproduced from: p.14–20.

Concluding thoughts on distributions of health spending

14.95. As can be seen from the material in this chapter, development of distributions of health spending is difficult to characterize. There are many approaches to the problem, and the optimal approach depends upon the distributional dimension used, the nature of the data available to the health accountant, and the time and resources available to the task. Some dimensions are susceptible to distribution more readily than others, some require more data at greater levels of detail than others, and some comprise a full-scale research project in their own right.

14.96. As the art of health accounting evolves within countries and internationally, more examples and techniques will undoubtedly emerge to help refine and improve existing work. In the meantime, this *Guide*, it is hoped, has offered some insight into how such work can be structured to produce reasonably good quality work with a reasonable amount of effort.

Exhibit 14.5 Appia: worksheet for expenditure distribution for hospital inpatients, 2002

	Source	Formula	Total	Quintile distribution				
				Q5	Q4	Q3	Q2	Q1
Inpatient spending (HC.1.1)	P x F table							
Ministry of Health hospitals		a	7 125					
Regional hospitals		b	12 419					
Private hospitals		c	23 244					
Total inpatient days	Hospitals reports, allocated by Ministry of Health Study							
Ministry of Health hospitals		d	26 197	820	6 563	7 782	6 942	4 090
Regional hospitals		e	131 378	14 753	22 151	31 130	31 035	32 309
Private hospitals		f	28 694	20 080	8 614	0	0	0
Inpatient spending per patient day	Computed							
Ministry of Health hospitals		g=a/d	272					
Regional hospitals		h=b/e	95					
Private hospitals		i=c/f	810					
Inpatient days, by payer	Percentages from Ministry of Health study applied to inpatient days							
Ministry of Health hospitals		j						
National Insurance Agency		k		820	6 563	7 782	5 040	1 600
Ministry of Health		l		0	0	0	1 902	2 490
Regional hospitals		m	131 378	14 753	22 151	31 130	31 035	32 309
National Insurance Agency		n		14 673	21 971	30 930	17 280	15 000
Government insurance		o		80	180	200	180	0
Ministry of Health		p		0	0	0	13 575	17 309
Private hospitals		q	28 694	20 080	8 614	0	0	0
National Insurance Agency		r		19 708	8 354	0	0	0
Private insurance		s		372	260	0	0	0

	Source	Formula	Total	Quintile distribution				
				Q5	Q4	Q3	Q2	Q1
Inpatient costs, by payer	Days multiplied by cost per day (except that National Insurance Agency payments for private hospital days limited to 3.67 times regional cost per day							
Ministry of Health hospitals			7 126	223	1 785	2 117	1 888	1 112
National Insurance Agency		t=k*g	5 931	223	1 785	2 117	1 371	435
Ministry of Health		u=l*g	1 195	0	0	0	517	677
Regional hospitals								
National Insurance Agency		v=n*h	9 439	1 387	2 077	2 924	1 633	1 418
Government insurance		w=o*h	60	8	17	19	17	0
Ministry of Health		x=p*h	2 919	0	0	0	1 283	1 636
Regional subsidy		split by m	23	3	4	5	5	6
Private hospitals			23 482	16 433	7 049	0	0	0
National Insurance Agency		y=3.67*h*r	9 735	6 837	2 898	0	0	0
Co-payment		z=r*(i-3.67*h)	12 997	9 128	3 869	0	0	0
Private insurance		aa=s*i	512	301	211	0	0	0
Nongovernmental organization subsidy		split by q	238	167	71	0	0	0
Total inpatient, by payer								
Ministry of Health			4 114	0	0	0	1 801	2 313
Regional government			23	3	4	5	5	6
National Insurance Agency			25 105	8 447	6 760	5 041	3 004	1 853
Government insurance			60	8	17	19	17	0
Private insurance			512	301	211	0	0	0
Households			12 997	9 128	3 869	0	0	0
Nongovernmental organization subsidy			238	167	71	0	0	0
Adjusted to FAxF figures		FAxF						
Ministry of Health		4108	4 108	0	0	0	1 798	2 310
Regional government		23	23	3	4	5	5	6
National Insurance Agency		25071	25 071	8 436	6 751	5 034	2 999	1 851
Government insurance		60	60	8	17	19	16	0
Private insurance		508	508	299	209	0	0	0
Households		12780	12 780	8 976	3 804	0	0	0
Nongovernmental organization subsidy		238	238	167	71	0	0	0

Exhibit 14.7 Appia: current expenditure on health, by financing agent and by household expenditure quintile
Calendar year 2002 (millions of crowns)

Household expenditure quintile	Financing agents													
	HF.1 General government						HF.2 Private sector						HF.3	Total, all financing agents
	HF.1.1 Territorial government				HF.1.2		HF.2.1 & HF.2.2		HF.2.3	HF.2.4	HF.2.5			
	HF.1.1.1 Ministry of Health	HF.1.1.3 Ministry of Defence	HF.1.1.2 Regional government	Total	National Insurance Agency	Total	Private health insurance	Government group insurance	Private households' out-of-pocket expenditure	Non-governmental organizations	Employers	Total	Rest of the world	
Highest quintile	1 238	0	267	1 505	19 118	20 623	2 917	183	26 961	611	1 789	32 461		53 084
Fourth quintile	1 238	0	268	1 506	15 618	17 124	1 849	193	18 868	501	1 089	22 500	0	39 624
Third quintile	1 238	0	269	1 507	12 388	13 895	483	120	13 831	413	770	15 617	0	29 512
Second quintile	7 817	622	269	8 708	8 417	17 125	161	67	12 716	568	482	13 994	0	31 119
Lowest quintile	10 909	0	271	11 180	5 296	16 476	0	0	9 797	565	163	10 525	599	27 600
Total	22 440	622	1 344	24 406	60 837	85 243	5 410	563	82 173	2 658	4 293	95 097	599	180 939

Note: Current expenditure on health equals national health expenditure minus spending on education and research.

Chapter 15

Concluding thoughts

15.01. The intent of this *Guide* has been to expose health accountants to the principles of health accounting. Health accounts involve a rigorous tracking of money through the health system, using mutually exclusive and exhaustive taxonomies that describe dimensions of the system. The accounts allow policy-makers to see the flows of resources: from their initial source to the entities that pool and distribute those resources, then to entities that engage in the activities and then to the beneficiaries of those activities (grouped by age and sex, socioeconomic status, health condition, etc.).

15.02. The *Guide* has also laid out some of the tools of the health accountant. One of these is a data map of the health financing system, which must be developed before setting out to populate the accounts. Another is a set of classification standards that allow meaningful partition of activities in the policy-relevant dimensions of the health care financing system. Some ways to generate data and some techniques that can be used to transform data into information have also been discussed.

15.03. The *Guide* has offered examples of health accounts and health accountants in action. Some have been case studies from countries with established or nascent health accounts; others have been drawn from the fictitious country of Appia. These examples have demonstrated that health accounting is as much an art as a science; it requires the application of rigorous principles, but also a substantial amount of subjective judgement on how to apply those principles.

15.04. If the project has not already begun, the reader of this *Guide* will soon start on health accounts in his or her own country. This may seem daunting, but it can be made easier if the health accountant remembers and employs the steps laid out in the *Guide*:

- identify and categorize the actors;
- identify the data sources and information gaps;
- secure and analyse strengths and weaknesses of data;
- fill the tables so that the figures balance;
- document all processes, information sources, concerns, and opportunities to strengthen the accounts.

Each step in this process can be used as an opportunity to review previous steps.

15.05. Each year's health accounts cycle builds on the ones before. In this sense, health accounting is like any other process in which the participants can engage in continuous improvement. Definitions can be sharpened and refined, data sources developed and refined, techniques expanded and refined, and additional dimensions of the health system illuminated. Good health accounting is as much about the journey as the destination.

Challenges encountered worldwide

15.06. Dozens of countries have implemented or begun to implement the standards for health accounts laid out in OECD's *System of health accounts* (SHA). Many others have or are building health accounts based on standards similar to those in the SHA. The experiences of these countries reveal some challenges in health accounting that transcend national borders. The following observations can be made about the state of health accounting (especially using the SHA) at the end of 2002.

15.07. National data systems may not record data along the lines of the SHA. For example, in Australia some inpatient physician services are recorded with "office of physicians" rather than with "hospitals", making the allocation of those services to inpatient care difficult. In the Netherlands, functional data do not distinguish the mode of delivery (inpatient, day care, outpatient). Often data are reported according to a time frame different from that of the health accounts (fiscal year data must be fitted into a calendar year framework or calendar year data into a fiscal year framework).

15.08. Drawing the boundary between social services and health services can be made more difficult by data limitations. For example, in Sweden, local municipalities deliver both types of services, and time-use studies were needed to separate expenditure into the two types.

15.09. It can be difficult to distinguish between public health, preventive activities engaged in by individuals, and health-related activities. For example, in Mexico, environmental health is considered part of prevention. Definitions aside, data sources may report different spending for types of activities in different places.

15.10. Not all providers fit neatly into the SHA categories. For example, in Finland, some outpatient clinics also provide inpatient services, and provide both curative and preventive care, so that the health accounts team had to use unit cost estimates to split expenditure among the functions.

15.11. The distinction between social security, social insurance, and other health insurance is not always clear-cut. For example, in Spain there is still debate over how to classify civil servants' health insurance.

15.12. Subnational authorities may report data in different ways. For example, in Mexico, states are not required to report a detailed breakdown of health expenditure to the central government, and the Mexican health accounts team has organized work groups at the central and state levels to establish regional and national health accounts (NHA).

15.13. The SHA categories may not facilitate separation of policy-relevant activities. For example, stewardship is an important policy issue in Mexico, but the ICHA-HC classification does not have such a category.

15.14. Most countries have required considerable time initially to implement the ICHA classifications (12–24 months), as typically this has entailed significant work to identify new data sources or estimation methods, particularly in the case of the functional disaggregation of expenditures. Success in this area has been easiest in the case of public expenditure, but significant methodological and data problems remain for classifying private expenditures. Modifications to ICHA schedules are fairly common; for example, the ICHA-HC has been expanded to include and separately categorize expenditures for Ayurvedic medicine in Sri Lanka and for traditional Chinese medicine in the Hong Kong SAR of China. Similar modifications of the ICHA-HP classifications have been necessary to take into account the providers of such services. Several countries have also found it necessary for policy reasons to further disaggregate the public health category of the ICHA-HC.

15.15. The collection and processing of data poses challenges. Problems in the identification of expenditures on day care and long-term nursing care have not been of much concern to many lower-income countries, where these expenditures remain limited, but all countries have faced significant problems in estimating household spending. Considerable work needs to be done in improving methods, and several countries have shifted away from reliance on household surveys to estimate these expenditures.

15.16. Estimation of international trade in health services is a policy issue for many countries, and methods and data sources are currently inadequate.

15.17. Many countries have structured their work to display the results in two ways — one based on the SHA and another based on a national framework. This is when the SHA does not meet the requirements of national policy-makers. Those countries with no legacy NHA system have found this easiest to do, as they have established national frameworks closely based on the SHA. For example, Sri Lanka has developed a procedure of dual coding using both national and ICHA classifications to facilitate production of parallel estimates.

Resources available to health accountants

15.18. The support available to NHA teams increases as health accounting becomes more and more prevalent worldwide. Annex A to this *Guide* provides some idea of what was available when this edition went to press in early 2003, but the list is growing continuously.

15.19. In addition to this *Guide*, there are other printed resources available. The OECD *System of health accounts* (SHA) provides guidance on definitions and classifications of health system actors. The SNA provides guidance on economic valuation. Textbooks on survey analysis can help the health accounts team turn sample data into generalized information.

15.20. The proliferation of material on the World Wide Web brings help even closer to hand. The SHA manual is now available via the Internet. OECD, WHO, World Bank, and USAID devote sections of their web sites to issues in health accounting. Networks of health accounts in Latin America and the Caribbean, and in Asia and the Pacific, maintain web sites for the exchange of success stories and challenges faced by national teams. Through resources such as these, health accountants can establish contacts with colleagues in other countries.

15.21. Equally important in this assistance is construction of a network of health accounts "customers" and "suppliers" within the country. This network can provide advice on the policy usefulness of health accounts structures and thoughts about where the health system is headed and how the accounts can evolve to maintain their relevance. The network of contacts can also keep the team up to date with improvements in data sources or the emergence of new data and of new structures in the health system itself. Active networks exist in Latin America and the Caribbean, in Asia and the Pacific, in eastern and southern Africa, and in the Middle East and north Africa.

What does it mean to be a health accountant?

15.22. This *Guide* has reflected some of the obligations of the health accountant. Health accounting is a perpetual quest and a constant challenge to satisfy criteria of sensitivity to policy issues, of comprehensiveness, of consistency, of timeliness, and so on, as well as to facilitate cross-country comparisons. Health accountants — number crunchers that, by the nature of their trade, are also a distinct breed of policy analysts — are expected to share, at the professional level, most of the attributes attached to the accounts they produce.

15.23. Just as NHA are not a tool of or for health system reform, health accountants' professional commitment is one of neutrality with respect to the institutions and events entering the descriptive-analytical process they develop. It is not their role to arbitrate between the parties, as doing so can jeopardize the perceived impartiality and intellectual honesty of the accounts. To be truly useful, health accounts must track all the funds in the health system, including those in the unofficial economy. Health accountants must be fair and impartial in their assessment of data and information, and they must be honest brokers of information to policy-makers and decision-makers.

15.24. The health accountant is foremost a historian. The role of the historian is patiently to collate data of all kinds and weave them into a plausible story. In one respect, historians cannot sit on the sidelines: they must contribute to the interpretation of that story and, in some ways, defend its plausibility.

15.25. In addition to interpreting a history still in the making, for which much documentation has yet to emerge, health accountants must also anticipate situations in the making that are not yet perceived by society. For example, the rise of ambulatory surgery and of minimally invasive surgery in a framework that

distinguishes only between inpatient and outpatient care has been — and still is — a challenge for health classifications. Health accountants can and should work constantly and with an eye on the future to guide the growth of their country's data systems.

15.26. The health accountant is, in some ways, the locus of expertise through which less quantitatively trained policy-makers and stakeholders optimize interests that at times appear conflicting, and at times are short of organized information. This position is attained notably through exacting statistical requirements — described throughout this *Guide* — and a capacity to synthesize large volumes of information in relatively concise formats, as well as generating new information sources around the processes in motion.

15.27. The health accountant must also be a communicator. Social science models may be developed with abstract concepts and mathematical shortcuts. Accounts must be intelligible to those elected to parliament, to those nominated to executive functions in government, to policy analysts, and — at some level of aggregation — to the general public. NHA are not solely a sequence of tables or a sequence of tables with time series, they are also a report that identifies key messages, sometimes pointing to areas that appear to require priority attention. The ethics of accounting invite health accountants to present these findings in terms that are accessible to all stakeholders and are unambiguous.

15.28. The stewardship of the health system requires many things, among them:

- A thorough knowledge of the agents, interventions and their interactions, as well as that of the environment, of the stock of assets and of available opportunities within the system,
- An identification of the system's stakeholders, their role in the fulfillment of the system's objectives, their information requirements and their potential technological paths,
- The empowerment vested in stakeholders, their interests in an information strategy and their willingness to share information,
- Fairness in the arbitrage and in the equilibrium pre-existing and existing after greater transparency among stakeholders.

15.29. The health accountant attempts to describe exhaustively and consistently the features of a health system. This representation requires a certain amount of modelling and simplifying. In the process of quantifying hundreds of cells with plausible results, even seasoned accountants uncover facets of their health system that had been bypassed in earlier representations.

15.30. Pitfalls await the health accountant, as the development of the health accounts tables requires assumptions about the nature of the health care system. Intellectual honesty is required in determining an appropriate set of hypotheses that apply to the health system being described. If the accounts are truly to reflect the workings of the health care financing system, they must be comprehensive — treating all actors. They must also afford equal treatment to actors performing identical functions and to interventions aiming at similar purposes. Health accountants must be willing to assure this treatment.

15.31. They must also strive for continuous improvement of their work. Only in the initial stages of NHA construction, when limitations in the access to information restrict the ambitions of the first round of tables selected and limitations in data collection shrink classifications to a few aggregates, is rationing of exploratory variables accepted. Year after year, the health accountant needs to verify the pertinence of the tables developed as well as of the breakdowns attained in populating these tables and the quality of the data in each cell. Omissions must be tracked relentlessly, the nature of the data must be questioned. Evolving health systems, shifting consumer and producer behaviour, growing technological capacity, and the ability to finance health care goods and services pose never-ending challenges to the fragility and the stability of the accounting design.

15.32. Health accountants — even those originally trained in one of the many specialized disciplines that make up a health system — are, by nature, generalists. They must understand something about the place and size of all components and the role of every agent in the health system at stake, and about all interventions modifying the precarious equilibrium between inputs and outputs. At the same time, they are specialists, expected to collate quantitative observations very diverse in nature and measure their intricate interactions, to impute values in cells that need be populated but have remained empty, to interpret as honestly as possible the meaning of the quantitative values collated.

15.33. Health accountants are invited to consider five other principles: a permanent commitment to transparency; an ability to employ judgement in a non-partisan and professional way; a recurrent and open interaction with all stakeholders; a commitment to continuous improvement; and patience and resolution to overcome all hurdles.

A permanent commitment to transparency

15.34. This *Guide* has stressed that a number without a source and a classification without definitions are the reefs on which many previous attempts at structuring knowledge have foundered. The health accountant's memory cannot be trusted to keep track of the provenance of the thousands of cells in the accounts. The need to replicate the process year after year requires full documentation, as does the need to ensure a continuous upgrading of the quality of those cells for which data are weak. Each decision by the estimator or by the team of estimators needs to be documented in writing. The objectives of such records are to ease the repeated estimation process in the following years and to orient new personnel when the estimator of the previous round is assigned other missions or the team of estimators is modified.

An ability to employ judgement in a non-partisan and professional way

15.35. Professional judgement is a term that refers to the exercise of educated guesswork by the estimator or the team of estimators. When dealing with statistics, guesswork may sound unscientific, but the demand to impute values for individual cells is large. If all figures to populate each table were readily accessible, there might be a strong case for delegating the task of compiling the NHA to a junior bookkeeper and there would be no need for an ever-evolving analytical process simulating the flows of health system financing and delivery. Professional judgement is required because of the scarcity of information and because of the need to interrelate a large number of variables. It is thus based on knowledge.

15.36. The idea of making a notional allowance for cells that cannot be populated in the current round of the health accounts is difficult for one who approaches accounting with an ingrained perception that statistics are a form of bookkeeping. The foremost responsibility of the health accountant is to synthesize a measure of the nation's spending and financing flows that presents the most accurate picture possible of the health system. When endogenous or exogenous indications exist that a cell should have a value but no information can be collated from the agent or agents financing that intervention, the providers supplying the service, or the beneficiary of that intervention, the bookkeeping entry is a blank. What is required of the health accountant in this case is a "guess" of a plausible size for the value in that cell. Fortunately, the number of such cells is often smaller than one might fear. Furthermore, errors that occur in the "guesstimating" process often tend to offset one another. Even more encouraging is that openness about "guesstimation" frequently leads to the discovery or release of information previously unknown to the health accounts team — information that can be used in subsequent cycles of the accounts.

15.37. Judgement is also required in cases where cell values look implausibly high or low. Judgement is also required to select sources of information when several co-exist, none of which meets the criteria set

out, and to propose corrections of the biases until such time as a more appropriate or exact source emerges. Again, openness about the judgements made can lead to the discovery of new data and information, and thus to continuous improvement in the health accounts process.

15.38. The health accountant's added value resides in his or her ability to reduce the uncertainty linked to the absence of data or their implausibility: over-valuation and under-valuation are frequent occurrences, particularly in the early stages of an accounting exercise.

A recurrent and open interaction with all stakeholders

15.39. Health accountants' duties include establishing collegial relations with the statisticians and policy analysts whose help they seek: those in charge of the macro-economic accounts, of public finance data, of price statistics, of household expenditure surveys, the superintendent of insurance, and so on. Beyond the confines of government, they must develop close contacts with nongovernmental and non-profit organizations, professional associations such as hospital federations and physician unions, nurses unions, patient associations, learned societies, and foreign and multilateral organization missions (where such exist).

15.40. There is some danger in these contacts. Because of their need to be candid about the quality of the data they use, health accountants run the risk of alienating those upon whom they depend for that data. Tact as well as candour are required, along with a willingness to work cooperatively with their colleagues to improve the quality of data.

15.41. The health accountant's interactions are not only with those who can help them deliver better health accounts, but also with their customers. Once the tables have been constructed, cells filled, a synthesis report drafted, a postmortem evaluation conducted and the next edition of the NHA put in motion, health accountants' responsibility includes communication with decision-makers, communication with institutions of higher learning, and communication with the public. The tables may be too complex for many stakeholders; an effort is required to design simpler indicators that will meet the test of broad intelligibility.

A commitment to continuous improvement

15.42. National accounting is seldom taught in institutions of higher learning; health accounting is taught nowhere, except through occasional workshops of short duration. Particular subject matters can obviously be acquired, notably in health economics and in statistics. The learning process in health accounting is largely based on actual experience and on-the-job acquisition of techniques. Health accountants across the world face similar problems; they have to rely on the learning process and their own creativity to acquire and enhance their skills. The only distribution of assets in the world that approaches equality is that of intelligence, found under all latitudes and longitudes, across all population spectra. The experience of other accountants (dealing with the economy at large, agriculture, transport, tourism, etc.) and of health accountants in other countries is thus of particular relevance. When similar problems encountered in broadly similar situations generate broadly similar technical solutions, there is no certainty that the solution is definitive, but the similarity does provide some reassurance that the solution adopted in one's own country is not egregiously wrong.

15.43. The enhancement of skills extends to the instruments used in health accounting. In the first rounds of the health accounts, production constraints may require the team to go ahead with instruments of questionable validity. Their options may be limited to small-scale surveys and instruments, use of Delphi or key respondent approaches. Successive rounds of the accounts require a gradual increase in sophistication and more systematic sources of information. Health accountants must also monitor

development in other fields of accounting and in the social sciences in general so as to adopt methodological advances recorded in these areas. As this *Guide* is particularly addressed to low-income and middle-income countries, one area that presents considerable interest is that of surveys and sampling — one of the costliest components of basic data compilation in accounting when there are no general surveys on which NHA can ride piggyback. While lower-cost approaches may not always be as reliable, one of the constraints of the NHA is the overall cost of annual monitoring. Surveys being determined several years ahead, the health accountant's qualities must include a vision of needs that anticipate several years of demand.

15.44. There should also be continuous improvement of techniques. When numbers in cells are the product of a calculation, the pursuit of quality requires ex-post evaluation of the calculations introduced. Often, the development of estimates takes place under some duress, allowing little time for careful review of each cell's contents. Health accountants must possess the will to strive for a better outcome of the statistical process initiated, as well as the capacity to evaluate what is achievable in the time frame set to construct first-round NHA. Because more time spent on one cell or one row means less time spent on others, health accountants must balance the pursuit of quality with the need for a timely delivery of estimates. The motto should be: strive for better, but do not let the better become the enemy of the good.

Patience and resolution to overcome all hurdles

15.45. National health accounting is not a gigantic machine but a thought process. Wisdom comes with age for the health accountant, too. None have succeeded in creating health accounts overnight; all health accounts have evolved over time. History tends to repeat itself. This *Guide* only attempts to shorten the learning curve and reduce the diffusion time span.

The challenge

15.46. Health accounts are a powerful tool for health system analysis. They can be used to describe resource flows, to project those flows, and to analyse those flows in terms of their promotion of health system goals. Done well, a country's health accounts can contribute to the creation of rational health policy. The challenge posed to the NHA team in meeting the information needs of its customers is similar to that posed to the health system: to produce the best possible quality with the resources available.

(1) World Health Organization. *The world health report 2000. Health systems: improving performance. 2000.*

(2) Organisation for Economic Co-operation and Development. *A system of health accounts. 2000.*

(3) Bettcher DW, Sapirie S, Goon EH. Essential public health functions: results of the Delphi study. *World Health Statistics Quarterly,* 1998, 51:44-54.

(4) Organisation for Economic Cooperation and Development, International Monetary Fund, World Bank et al. *System of national accounts 1993.* 1994.

(5) Murray CJL, Lopez A. *The global burden of disease: A comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020.* Cambridge, Harvard University Press, 1996.

(6) *Monitoring financial flows for health research.* Global Forum for Health Research, 2001.

(7) Rannan-Eliya RP, Somanathan A. Estimation of confidence intervals for estimates on national health expenditures derived from health accounting studies. (IPS HPP occasional papers No. 14). Institute for Policy Studies of Sri Lanka, Health Policy Programme. 1999. http://www.ips.lk

(8) The World Health Survey quality assurance standards & guidelines. World Health Organization. 2003. http://www3.who.int/whs/P/training/06-QualityAssurance_files/frame.htm

(9) Hoshaw-Woodard S. Description and comparison of the methods of cluster sampling and lot quality assurance sampling to assess immunization coverage. World Health Organization. 2001. http://www.who.int/vaccines-documents/DocsPDF01/www592.pdf

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

(11) Rannan-Eliya RP, Blanco-Vidal C, Nandakumar AK. The distribution of health care resources in Egypt: implications for equity. 2000. Harvard School of Public Health. Data for Decision Making Project. Ref Type: Report

(12) Organisation for Economic Co-operation and Development. *Ageing in OECD countries: a critical policy challenge.* Paris, 1996.

(13) Polder JJ. *Cost of illness in the Netherlands: description, comparison and projection.* Rotterdam, Erasmus University Press, 2001.

(14) Rannan-Eliya RP, Berman P, Eltigani E, de Silva WI, Somanathan A, Sumathiratne V. Expenditures for reproductive health services in Egypt and Sri Lanka. (Ips Hpp occasional papers no. 13). Institute for Policy Studies of Sri Lanka, Health Policy Programme . 2000. http://www.ips.ik

(15) Gisbert R, Brosa M, Figueras M et al. *El coste de la enfermedad en España: el coste de las enfermedades cardiovasculares.* Madrid, Merck Sharp & Dohme De España, 1997.

(16) Rannan-Eliya RP, Nada KH, Kamal AM, Ali AI. Egypt national health accounts 1994–1995 (DDM working papers). 52–54. 1997. Harvard School of Public Health. Data for Decision Making Project. Ref Type: Report

Annex A

Resources available for health accountants

Manuals

A.01. *A system of health accounts* (SHA) Version 1.0 is the framework established for OECD Member countries for health accounts. As of the summer of 2002, roughly half of the OECD Member countries had begun to implement SHA in their health accounts. SHA contains a detailed discussion of classification schedules for the various actors in the health system, and crosswalk tables showing the connection between these classification schedules and those used in the broader *system of national accounts* (SNA). The SHA manual can be purchased from the OECD, and also is available on the World Wide Web at http://www.oecd.org/EN/documents/0,,EN-documents-684-nodirectorate-no-15-no-12,00.html

A.02. *System of national accounts (SNA) 1993* is the definitive manual for preparation of macroeconomic accounts, developed under the auspices of Eurostat, the International Monetary Fund (IMF), OECD, the United Nations, and the World Bank. It contains extensive discussion of how to place a value on the various economic activities that occur in a nation, and is very useful to health accountants who need to measure health expenditure by non-market actors. This document can be purchased from any of the sponsoring organizations, and can be found on the World Wide Web (http://unstats.un.org /unsd/sna1993/toctop.asp). An introduction to the SNA93, as well as other handbooks and manuals on national accounting, can be found on the World Wide Web at http://unstats.un.org/unsd/sna1993/introduction.asp

A.03. *Government finance statistics manual 2001* is published by the International Monetary Fund and covers concepts, definitions, classifications, and accounting rules. It provides a comprehensive analytical framework within which the statistics can be summarized and presented in a form appropriate for analysis, planning, and policy determination. It can be purchased from the IMF, and is also available at http://www.imf.org/external/pubs/ft/gfs/manual/index.htm

National health accounts web sites

A.04. Several networks of health accountants have established communities on the World Wide Web. At the time this *Guide* was published, these sites included:

- APNHAN (Asia-Pacific National Health Accounts Network) http://www.apnhan.org
- LAC (Latin America and the Caribbean): http://www.lachealthaccounts.org/

Information on other networks can be found on the Partnerships for Health Reform (PHR) website at http://www.phrplus.org

A.05. Sections devoted to health accounts can be found on some of the international organizations' web sites. See, for example,

- OECD: http://www.oecd.org/EN/home/0,EN-home-684-nodirectorate-no-no-no-12,00.html
- United Nations (Latin America): http://www.eclac.org/default.asp?idioma=IN
- WHO (World Health Organization): http://www.who.int/nha
- World Bank: http://www1.worldbank.org/hnp/hsd/nha_index.asp

A.06. Harvard University's International Health Systems Group maintains a web site at http://www.hsph.harvard.edu/ihsg/ihsg.html

National health accounts reports available on the World Wide Web

A.07. In January 2003, a search on "national health accounts" using the search engine http://www.google.com produced more than 3 000 addresses. Papers on methodologies, reports of specific country estimates, and other types of information were included among the entries.

Documents drawn upon for this *Guide*

A.08. In addition to the manuals and reports mentioned above, several reports and papers have been used for the case studies and examples in this *Guide* as well as those listed as references:

Cárdenas M. [Bolivian] Health sector funding and expenditure accounts. MoHSS, DDM, PHR January 2000.

Data International Ltd., Nepal Health Economics Association, and Institute of Policy Studies. 2001. Equity in Financing and Delivery of Health Services in Bangladesh, Nepal and Sri Lanka. Colombo, Sri Lanka: Institute of Policy Studies. [www.ipsarchive.lk/hpp/triequity.pdf]

Institute of Policy Studies, 2000 Sri Lanka public health

Malaysia National Health Accounts Project Team, Government of Malaysia. September 2001. Draft Outline Of Proposed Framework For Malaysia National Health Accounts (MNHA). Version Dated 15th September 2001

Ministry of Health of Lebanon, World Health Organization, World Bank. Lebanon national health accounts. Ammar W, Fakha H, Azzam O, Khoury RF, Mattar C, Halabi M et al., editors. 2000

Poullier JP, Hernandez P, Kawabata K. National health accounts: concepts, data sources and methodology. In: Murray CJL, Evans DB, eds. Health systems performance assessment: debate, new methods, and new empiricism. Geneva, World Health Organization, 2003.

Poullier JP, Hernandez P, Kawabata K et al. Patterns of global health expenditures: results for 191 countries. In: Murray CJL, Evans DB, eds. Health systems performance assessment: debate, new methods, and new empiricism. Geneva, World Health Organization, 2003.

Rannan-Eliya, Ravi P., Claudia Blanco-Vidal, and A. K. Nandakumar. 2000. The Distribution of Health Care Resources in Egypt: Implications for Equity. Boston, MA: Data for Decision Making Project, Harvard School of Public Health. [www.ihsg.hsph.harvard.edu/]

Social protection in EU Member States and the European Economic Area. 2000 MISSOC. European Commission [Unit E.2]

Van Adams A., Hartneitt, Cost-sharing in the social sectors of the Sub-Saharan Africa, impact on the poor, Washington, World Bank Discussion Paper no. 338, 1996

Survey methodology and analysis references

A.09. There is a huge body of literature available on how to conduct and use surveys. The list that follows provides only a sample of that literature.

General references:

Henry GT. *Practical sampling*. Applied Social Research Methods Series, Volume 21. Sage Publications; 1990.

Hoshaw-Woodward S, *Description and comparison of the methods of cluster sampling and lot quality assurance sampling to assess immunization coverage*. World Health Organization. Department of Vaccines

and Biologicals, Geneva, 2001. 1–15.

Kish L., *Survey sampling*. New York: John Wiley and Sons; (1965) (contains a fairly detailed model of survey error.)

Sadana R, Mathers CD, Lopez AD et al. *Comparative analysis of more than 50 household surveys of health status*. In: Murray CJL, Salomon JA, Mathers CD, Lopez AD, eds. Summary measures of population health: concepts, ethics, measurement and applications. Geneva, World Health Organization, 2002.

Salant P, Dillman DA. *How to conduct your own survey.* John Wiley & Sons, Inc; 1994.

Schonlau M, Fricker RD, Elliot MN, *Conducting research surveys via E-mail and the Web*. ISBN: 0-8330-3110-4, MR-1480-RC, Rand, 2001. available (http://www.rand.org/publications/MR/MR1480.)

Ustun B, Chatterji S, Villanueva M, Bendib L, Celik C, Sadana R et al. *WHO Multicountry Household Survey Study on Health and Responsiveness 2000-2001* (Global Programme on Evidence for Health Policy GPE Discussion Paper 37). 2000.

On survey error:

Anderson R, Kasper J, Frankel M, *The effect of measurement error on differences in hospital expenditures.* Medical Care 1976; 14:932–949.

Andersen R, *Health services use*. In: Andersen R, Kasper J, Frankel MR, et al. Total survey error: applications to improve health surveys. San Francisco: Jossey-Bass, Inc.; 1979.

Cleary PD, and Jette AM. The validity of self-reported physician utilization measures. Medical Care 1984; 22(9).

Murray CJL, Tandon A, Salomon JA et al. *New approaches to enhance cross-population comparability of survey results.* In: Murray CJL, Salomon JA, Mathers CD, Lopez AD, eds. Summary measures of population health: concepts, ethics, measurement and application. Geneva, World Health Organization, 2002.

Salomon J, Tandon A, Murray C.J.L. *Using vignettes to improve cross-population comparability of health surveys: concepts, design, and evaluation techniques* (Global Programme on Evidence for Health Policy Discussion Paper 41). 2001.

Tandon A, Murray C.J.L., Salomon J.A., King G. *Statistical Models for Enhancing Cross-Population Comparability* (Global Programme on Evidence for Health Policy Discussion Paper 42). 2001. Geneva: World Health Organization.

On recall bias:

Grosh M, and Glewwe P, eds. *Designing household survey questionnaires for developing countries: lessons from 15 years of the Living Standards Measurement Study. Volumes 1, 2, and 3*. Washington, DC: The World Bank. 2000.

National Center for Health Statistics. Balamuth E. *Health interview responses compared with medical records*. Vital and Health Statistics, Series 2, No. 7. 1965.

National Center for Health Statistics . Cannell C, Fisher G and Bakker T. *Reporting of hospitalization in the Health Interview Survey; a methodological study of several factors affecting the reporting of hospital episodes*. Vital and Health Statistics, Series 2, No. 6. 1965.

Scott C, Amenuvegbe B. *Effect of recall duration on reporting of household expenditures: An experimental study in Ghana*. SDA Working Paper No. 6. Washington, DC: The World Bank. 1990.

On non-sampling error:

Bangladesh National Health Accounts 1996/97. Dhaka: Data International for Ministry of Health and Family Welfare; 1998.

Estimates of domestic health expenditure 1989/90 to 1996/97, the Hong Kong SAR of China. Health Policy Programme Occasional Paper 10. Colombo: Institute of Policy Studies; 1998.

Sri Lanka national health accounts: Sri Lanka national health expenditures 1990-1999. Colombo: Ministry of Health and Institute of Policy Studies; 2001.

Rannan-Eliya RP, Nada KH, Kamal AM, Ali AI. *Egypt national health accounts 1994/95*. Data for Decision Making Publication. Boston: Harvard School of Public Health; 1998.

Rannan-Eliya RP, Somanathan A. *Estimation of confidence intervals for estimates of national health expenditures derived from health accounting studies.* Health Policy Programme Occasional Paper 14. Colombo: Institute of Policy Studies; 1999.

On the Demographic and Health Survey (DHS) (probably the best known survey for non-OECD countries with emphasis on health status and special issue areas such as maternal and child health):

Gakidou E, King G. Measuring total health inequality: adding individual variation to group-level differences. In: Murray CJL, Evans DB, eds. Health systems performance assessment: debate, new methods, and new empiricism. Geneva, World Health Organization, 2003.

Gakidou E, King G. Determinants of inequality in child survival: results from 39 countries. In: Murray CJL, Evans DB, eds. Health systems performance assessment: debate, new methods, and new empiricism. Geneva, World Health Organization, 2003.

Gwatkin DR. Health inequalities and the health of the poor: What do we know? What can we do? *Bulletin of the World Health Organization 2000;* 78(1): 3-18.

Gwatkin DR, et al. *Socio-economic differences in health, nutrition, and population.* Health, Nutrition, and Population Series, various issues. Washington, DC: The World Bank; 2000.

On rapid assessment processes (see also the American Anthropological Association's resources web site: http://www.ameranthassn.org/resinet.htm):

Rapid Assessment Process. The publications specifically devoted to the proper use of these methods include several issues of the *World Health Statistics Quarterly,* e.g. vol. 44, no 3, 1991; a brochure on *Use of the rapid evaluation method for evaluating maternal and child health and family planning services*, Geneva: World Health Organization; 1992 (WHO/MCH/FPP/92.7.) See also http://www.rand.org/publications/MR/MR1480; and *Description and comparison of the methods of cluster sampling and lot quality assurance sampling to assess immunization coverage*, Geneva: World Health Organization; 2001 (WHO/V&B/01.26.)

Beebe J. *Rapid assessment process. An introduction.* Walnut Creek, CA: AltaMira Press, 2001.

Creswell JW. *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage. Publications; 1998.

Kumar K, ed. *Rapid appraisal methods*. Washington, DC. The World Bank; 1993.

Lanata CF, Black RE. Lot quality assurance sampling techniques in health surveys in developing countries: advantages and current constraints. *World Health Statistics Quarterly 1991;* 44(3): 133–139.

Lemeshow, Taber S. Lot quality assurance sampling: single and double-sampling plans. *World Health Statistics Quarterly 1991;* 44(3): 115–132.

Marshall C, Rossman GB. *Designing qualitative research*, 3rd ed. Thousand Oaks, CA: Sage. Publications; 1999.

Miles MB, Huberman MA. *Qualitative data analysis: An expanded sourcebook,* 2nd ed. Thousand Oaks, CA: Sage. Publications; 1994.

Annex B

Definitions of categories in the International Classifications for Health Accounts and in other useful classification schemes

Definitions of categories in the International Classifications for Health Accounts and in other useful classification schemes

B.01. This annex contains a detailed discussion of the categories contained in classification schemes used in this *Guide*. The *System of health accounts Version 1.0* manual covers the classification schedules for health functions, health providers, and financing agents, and can be found at http://www.oecd.org /pdf/M00036000/M00036524.pdf

B.02. The ICHA family of classifications does not cover all the dimensions of the health system discussed in this *Guide*. Two other useful classification schemes are published below: the financing sources classification and the resource cost classification. These schedules for classifying activity in the two dimensions indicated are consistent with national accounts and other standards and may prove useful in building national health accounts (NHA).

The financing sources classification

B.03. The financing sources (FS) classification (Table 4.5) is used to categorize the actors that provide funds for health care financing. Money flows from these actors to the financing agents, who pool those funds and use them to purchase health care goods and services.

B.04. It is possible to be both a financing source and a financing agent in the health system. For example, households provide funds to insurance schemes through their payment of premiums, and they also provide funds for their own purchase of health care.

Public funds (FS.1)

B.05. In this schedule, FS.1 covers all public funds. This category is further divided into funds generated by territorial governments and funds provided through other government entities.

Territorial governments (FS.1.1)

B.06. FS.1.1 captures all funds generated as general revenue by various levels of territorial government - central, provincial/state/regional, and local/municipal government general revenue. These funds include those raised through general revenue, as well as taxes that are earmarked for health care but collected as value-added, income, or property taxes. It also includes non-tax revenues raised for the purpose of financing health care activity. For example, some governments fund part of their health programmes through lotteries; in such cases, the lotteries are included under FS.1.1.

B.07. Subcategories can be created within this category to accommodate particular sources of revenue that are of policy interest. For example, when it is important for policy purposes to separate regional government general revenue from funds generated by a government lottery, FS.1.1.2.1 can be created to report general revenue and FS.1.1.2.2 can be created to report the lottery revenues. As with any classification schedule, it is essential to remember when creating subcategories that they must be mutually exclusive and exhaustive (funds must be allocated to one — and only to one — category).

B.08. Payroll taxes marked for health care should be categorized with the entity paying them (employers or households).

Other public funds (FS.1.2)

B.09. Revenues generated by the return on government-held assets (such as trust fund balances) are listed as FS.1.2.1. Funds generated by task forces, special entities for particular population groups (for example, women or low income groups), and other publicly financed entities such as universities, etc. are listed as FS.1.2.2.

Private funds (FS.2)

B.10. FS.2 covers all private national funds. Like FS.1, it is further divided. FS.2.1 captures the activities of firms (including non-profit institutions) in their capacity as employers.

Employer funds (FS.2.1)
B.11. Employer funds take two forms, the first of which comprises contributions to insurance programmes for the entities' employees (when such programmes exist), and to social security schemes (when such payments are required). The second type of funding is for health care activities financed directly by the employer as such, either through self-insurance or in operating the employers own health care facilities.

B.12. Contributions to social security funds made by employers are counted here even when the contribution is formally labelled as a tax. This is because the contribution is commonly recognized as intended for health care purposes.

B.13. Funds provided by parastatal entities acting as employers are included under FS.2.1 (employer funds). When there is policy interest in keeping them separate, it may be appropriate to create mutually exclusive and exhaustive subcategories under the FS.2.1 heading or appropriate subheadings; for example, FS.2.1 could be divided into FS.2.1.1 (parastatal employers) and FS.2.1.2 (other employers).

Household funds (FS.2.2)
B.14. The FS.2.2 category captures household payments used for health goods and services, and household payments controlled through financing agents. These funds include social security and private insurance contributions. The former include all forms of direct payments to providers to cover co-insurance amounts or services not covered by insurance schemes. The category includes funds used to make unofficial, undocumented, informal, or "grey market" payments to providers.

B.15. Household contributions to social security schemes are included under this heading. This treatment mirrors the treatment of employer payments of social security contributions and helps to clarify the role of households in funding the health system.

Nongovernmental organizations (FS.2.3)
B.16. The FS.2.3 category is used to capture funds provided by national nongovernmental organizations, also called non-profit institutions serving individuals or more simply non-profit institutions. These funds are those provided for health programmes in the year for which health accounts are being prepared.

B.17. The funds of nongovernmental organizations used to procure or provide services for their own employees are included with FS.2.1.

Other private funds (FS.2.4)
B.18. The FS.2.4 category is used to record other private funds. The most significant type of funds in this category (in most cases, the only type) is interest payments on assets held by health system actors such as social insurance schemes. The category also captures net flows of private-sector loan disbursements used by providers or insurers to cover current expenses.

Rest-of-the-world (FS.3)

B.19. The FS.3 category is reserved for funds that come from outside the country for use in the current year. External resources such as bilateral and multilateral international grants as well as funds contributed by institutions and individuals outside the country are included to the extent that they are used in the current period.

B.20. External resources mobilized over several years should be recorded for the year of use; for example, when funds are disbursed in equal parts over three years, one third of the total should appear in each year of the health accounts.

B.21. Bilateral and multilateral loans made to national governments should not be recorded here, as they represent a change in the debt position of the government. Rather, those funds should be recorded in category FS.1.1 when they are made available by the national government for use in the health care system. If it is important to identify funds provided through such loans, sub-categories of FS.1.1 can be created to show those funds separately; they can then be combined with the FS.3 funds in an exhibit table.

B.22. Concessional loans comprise a strong external subsidy. Disbursements from such loans can be reported under FS.3 with a note indicating that part may be repayable.

B.23. Payroll taxes and contributions made by external organizations to cover health insurance of employees in the country should be included with FS.2.1.

B.24. When this serves a policy interest, or when this helps to ensure a consistent time series of estimates, it is appropriate to create subcategories for specific external funding organizations. As with the other categories and classification schedules, subcategories must be mutually exclusive and exhaustive in order to meet the requirements of the health care accounts.

The resource cost classification

B.25. The resource cost classification in Table 4.8 captures expenditure according to the standard economic classification of resources used for the production of health services. The classification includes categories for current outlays (RC.1) and capital outlays (RC.2), with breakdowns for each one of these major categories.

B.26. Although this schedule can be applied in most instances to the activities of financing agents and health providers, not all categories in the schedule apply to health provider entities. This is explained below.

Current outlays (RC.1)

B.27. The RC.1 category accounts for the total value of the resources in cash or in kind, payable to a health provider by a financing agent on behalf of the final consumer of health services in return for services performed (including the delivery of health goods) during the accounting period.

Compensation of employees (RC.1.1)

B.28. The RC.1.1 category is divided into two parts. RC.1.1.1 includes all kinds of wages, salaries, and other forms of compensation, including extra payments of any nature, such as payments for overtime or night work, bonuses, various allowances and annual holidays. In-kind payments include meals, drinks, travel, special clothing, transportation to and from work, car parking, day-care for children, and the value of interest forgone when loans are provided at n — or reduced — interest rate.

B.29. The RC.1.1.2 category includes social contributions received by health personnel. Exceptions include employers' social contributions, in-kind payments of supplies and services required for work, and payments made to non-active workers.

Operating surplus (RC.1.2)

B.30. The RC.1.2 category refers to the property income receivable and payable to independent health personnel and health facility owners not included in RC.1.1.

Supplies and services (RC.1.3)

B.31. Supplies and services (RC.1.3) consist of all goods and subcontracted services used as inputs in production of health services. The RC.1.3.1 category includes goods that are entirely used up when they are fed into the production process, during which they deteriorate or are lost, accidentally damaged or pilfered. Such goods include inexpensive durable goods, for example hand tools, and goods that are cheaper than machinery and equipment. The category also includes tools used exclusively or mainly at work, for example clothing or footwear worn exclusively or mainly at work (such as protective clothes and uniforms).

B.32. From a policy perspective, one of the most important types of supplies is pharmaceuticals. For this reason, a subcategory (RC.1.3.1.1) is created specifically for pharmaceuticals.

B.33. Donations of materials and supplies should be treated to reflect real values, so the amounts recorded should be at market prices and net of subsidies minus indirect taxes.

B.34. Market and non-market goods acquired to increase inventory stocks should not be included.

Services (RC.1.3.2)

B.35. The complexity of health services delivery involves a considerable amount of subcontracting of intermediate health services, such as imaging and laboratory services, or direct provision of health care by specialized personnel, such as renal dialysis and part of cancer therapy. Intermediate services for medical infrastructure are also required, such as maintenance of buildings and of equipment. Both the intermediate and the final services purchased are included in the RC.1.3.2 category.

B.36. The services included are not only the ones used to provide the health care but also include those required periodically for the maintenance and repair of fixed assets, so that those assets can be used over the expected service lives without changing their performance. Typically, staff training, market research, transport, housing, meals and drinks are included here. Services used as employees', compensation are excluded.

Consumption of fixed capital (RC.1.4)

B.37. The consumption of fixed capital (RC.1.4) represents the reduction in the value of the fixed assets used in the production process during the accounting period, resulting from physical deterioration, normal obsolescence or damage. It measures the decline in the usefulness of a fixed asset for purposes of production. Measurement is frequently an assumed regular rate of decline of their efficiency in production over time, based on an average service life of the asset.

Interest payments (RC.1.5)

B.38. Interest payments accruing to loans made by different entities are not negligible. Interest is defined as payment on top of the amount of the principal borrowed, that has to be paid to the creditor by the debtor over a given period of time without reducing the outstanding amount. Interest may be a predetermined sum of money or a percentage of the outstanding principal. Interest is added to the principal.

B.39. When government units pay interest on debts on behalf of another unit, as the government incurring the debt as the primary obligor (debtor), the existing debt of another unit should be recorded as a subsidy (when the other unit is an enterprise), or transfer (if it is a government unit).

Subsidies to medical producers (RC.1.6)

B.40. Subsidies to medical producers (RC.1.6) are current unrequired payments that government units make to health services producers on the basis of the level of their production activities or the values of the goods or services that they produce, sell or import. They are designed to influence the level of production through lower prices as a kind of negative tax. Audited government accounts and producer accounts report in principle these amounts.

B.41. Subsidies are payable to producers only and not to final consumers, and are current transfers and not capital transfers. They are payable on specific products or on production in general. A subsidy in a product is payable per unit of good or service. The payment may involve an amount by each unit of product or be calculated as the difference between a specific target price and the market price actually paid by a buyer.

B.42. Subsidies may cover losses when they are a result of a deliberate government policy, as in the case of health services provided in prices under the average production cost.

B.43. This resource cost category does not apply to providers. It is a financing agent function. That an entity engages in these transfers or subsidies is an indication that it should be treated as a financing agent (perhaps in addition to its activity as a provider).

Transfers to households (RC.1.7)

B.44. Transfers to households (RC.1.7) are transactions by which government units reimburse households all or part of the cost of purchasing goods, services or durables without counterpart. These are mostly cash transfers related to health care goods and services, the bulk of the services and goods dispensed without payment being accounted for through the entries above.

B.45. Again, this category does not apply to providers.

Capital expenditure (RC.2)

B.46. Capital expenditure (RC.2) records the value of non-financial assets that are acquired, disposed of or have experienced a change in value during the period under study. The assets held by the health system include new acquisitions, and major renovation and maintenance of tangible and intangible assets that are used repeatedly or continuously in production processes of health care, over periods of time longer than one year. The main categories of the classification features are buildings (RC.2.1), capital equipment (RC.2.2) and capital transfers (RC.2.3). The categories RC.2.1 and RC.2.2 may include major renovation, reconstruction or enlargement of existing fixed assets, as these interventions can improve and extend the previously expected service life of the asset.

Capital transfers (RC.2.3)

B.47. Capital transfers are as any other transfer, considered as a governmental provision of assets without receiving in return any form of good, asset or service.

Annex C

National accounts, input/output tables, and satellite accounts

National accounts, input/output tables, and satellite accounts

C.01. Throughout this *Guide*, reference has been made to the system of national accounts 1993 (SNA93), to SNA staff, and to input/output tables. This annex provides a very brief introduction to these concepts, people, and tools.

C.02. The SNA93 is a joint product of the United Nations, the International Monetary Fund, the Commission of European Communities, the Organisation for Economic Co-operation and Development, and the World Bank. In the foreword to the SNA93, these sponsors describe it as "a comprehensive, consistent and flexible set of macroeconomic accounts intended to meet the needs of government and private-sector analysts, policy makers and decisions takers. It is designed for use in countries with market economies, whatever their stage of economic development, and also in countries in transition to market economies."

C.03. The most commonly known measure in the SNA93 is gross domestic product (GDP), but there are a large number of different measures and results generated by national income accountants. GDP measures the value of the goods and services produced by the economy's human, capital, financial, and natural resources in a given year. Because the SNA93 consists of an integrated set of income or expenditure and asset reports, based on internationally agreed concepts, definitions, classifications, and accounting rules, the SNA93 also allows measurement of wage and salary income, capital formation, household consumption, and so on, each of which is comparable with similar measures in other countries.

C.04. To a very great extent, the rules and conventions used in this *Guide* conform to those of the SNA93. Instances in which they differ (such as the treatment of government employee insurance programmes) are documented and explained. The OECD/SHA also conforms to the SNA93. Thus, the national health accounts (NHA) framework rests on very solid macroeconomic ground.

C.05. There are differences between countries in the organizational location of staff working to implement or use the SNA93. In some countries such staff work in the ministry of finance, the ministry of economy, the central bank, or a similar structure. In others, they work in the central statistical agency. In a few countries the initial development work on national accounting has been undertaken by a university, a research institute or a nongovernmental organization.

C.06. It is well worth the effort for health accountants to find people working on national accounts and to establish good working relationships with them. First, they bring the same set of skills and approaches to macroeconomic constructs as those required of health accountants. Second, because one important measure that comes from the NHA is the percentage of GDP accounted for by the health system, care must taken to ensure that the NHA work is consistent with work on the system of national accounts. Finally, in the course of their work the national accounts staff may have already produced an estimate of some of the items that will be measured in the health accounts; being able to use their work — or at least to compare it with the health accounts estimates — can be invaluable.

C.07. A special offshoot of the system of national accounts is a product called an input/output table, an example of which is shown in Table C.1. As its name suggests, it is a table that shows where an economy's production comes from and where it is used. If the national accounts staff have developed an input/output table, or if such a table has been developed in the ministry of planning, a university, or a similar place, it should be examined carefully. Often the health system is combined with other industries such as social welfare or recreation, but in other cases the input/output table can be a rich source of data for the NHA tables. In any case, health accountants should work with colleagues on the national accounts staff to build up the section of the input/output table devoted to the health care industries.

Table C.1 Example of a simplified input/output table

Inputs	Outputs							
	Intermediate sales			Final demand				Total
	Industry 1	Industry 2	Industry 3	Consumers	Investment	Govern-ment	Export	
Industry 1	0	10	7	0	0	0	0	17
Industry 2	2	8	1	1	20	10	3	45
Industry 3	0	1	6	50	1	10	0	68
Wages	9	20	40					69
Profit	5	4	12					21
Interest	1	2	2					5
Total	17	45	68	51	21	20	3	225

C.08. In some countries, national accounts staff have created or are creating "satellite accounts" for the health system. As their name suggests, satellite accounts extend what is referred to in the SNA93 as its central framework, to provide additional information on particular social concerns. The SNA93 manual enters into considerable detail on how satellite accounts can be created, and readers are directed to chapter XXI of that manual for additional information. Satellite accounts tend to focus on production and consumption, while NHA focus on consumption and financing, but the two can coexist and estimates made for one set of accounts can be used or adapted for use in the other set. Again, health accountants should work with colleagues on the national accounts staff to strengthen each other's product.

Annex D

Data techniques often used in health accounting

D.01. This annex is devoted to a discussion of the various types of data manipulation used during the preparation of a country's health accounts. It is often the case that the data source being used captures the right concept at the right time and with the right measurement. However, what differentiates good health accounts from excellent health accounts is the way in which less direct data are adapted.

D.02. The bulk of this annex deals with two situations in which health accountants frequently find themselves. The first is one in which they have one or more observation of the thing they want to measure, but not in the right time period. The second is one in which they do not have any measure of the thing of interest.

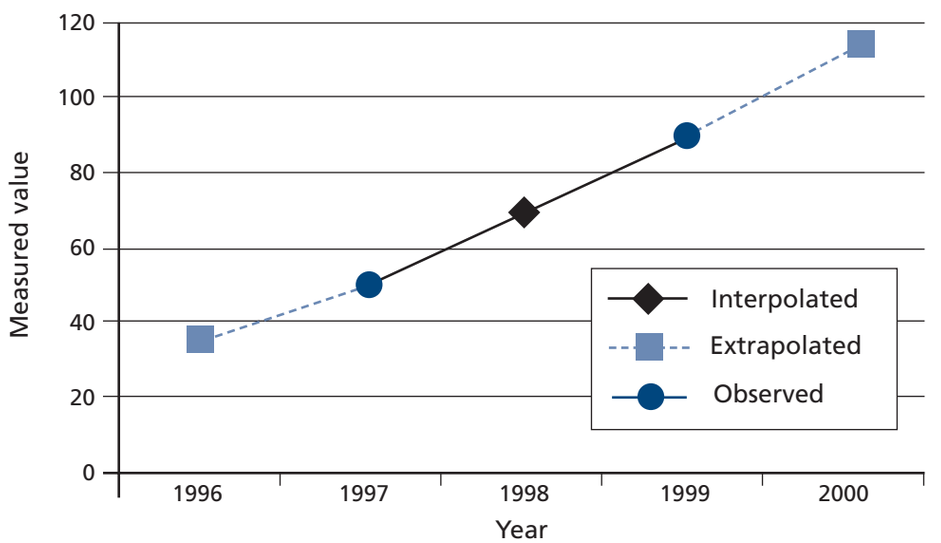
Interpolation and extrapolation

D.03. When data points do not fall into the time period for which estimates are being prepared, some way must be found to move them to that period. Typically, this is done through interpolation or extrapolation, or through some form of statistical modelling. The latter is often more accurate, but also requires a richness of data that is often missing in lower-income countries.

D.04. Because the techniques discussed in this section are forms of statistical manipulation, the terminology used will reflect that discipline, too. Most of the terms are straightforward, but, because they differ from those elsewhere in this *Guide*, it is worth a moment to clarify them. The things being measured (for example, retail sales of prescription drugs, or the value of hospital construction) are called "variables". Many of the techniques deal with repeated observations of a variable, and this string of observations is called a "time series". Of the many variables that exist, the variable of interest is called the "control variable". Other variables measure things that move in tandem with or in a similar fashion to the control variable; these are called "indicator variables". For example, there may be an interest in employers' expenditure for on-site clinic services for employees (the control variable); it is suspected that those contributions move in a fashion similar to total employment or medical prices or both (indicator variables).

D.05. Interpolation refers to making estimates between two observed points in the control series; extrapolation refers to making estimates without the advantages of two bounding observations. Figure D.1 illustrates how the observed values of the control variable are used to estimate interpolated and extrapolated values.

Figure D.1 Example showing how interpolated and extrapolated estimates are derived from observed measures



D.06. There are many occasions in which there are missing values for a control variable. For example, the control variable may be measured only every five years in an economic census; or records may have been destroyed or lost. For whatever reason, when the value of the control variable is missing in the years for which estimates are being prepared, it is possible to interpolate or extrapolate to estimate the missing value.

D.07. There are several ways to interpolate or extrapolate, depending upon what data are available. Various situations, with differing data availability, are described below. In each situation, the goal is to make maximum use of the data available. If there are multiple observations of the control variable and the indicator variable, the first step is to interpolate, and then to extrapolate.

Interpolating or extrapolating with an indicator series

D.08. The most helpful situation is one in which there is an indicator series. For example, if the control variable is measured every five years in an economic census, but there is also a small survey of economic activity every year, the latter can be used to interpolate or extrapolate the former.

D.09. The first step in the interpolation is to lay out the data and examine the ratio between the control series and indicator series, when they are known (see Table D.1). Here, it is important to look for two things. First, is the ratio stable over time? If it is, this is good evidence that the interpolation will be justifiable. If it is not stable, does it grow smoothly over time? If this is the case, then there is evidence that some process is at work that makes the indicator series an imperfect predictor of the control - but it still can be used to interpolate. Finally, is the ratio quite different from period to period? If this is the case, then perhaps the indicator series is, in fact, not a good indicator at all. Or perhaps there has been some significant change in the relationship between indicator and control between the observed periods; for example, there may have been changes in the law. If the latter is the case, then manual adjustments can be made to the interpolation, as demonstrated in the next paragraph.

Table D.1 Interpolation example 1

Example of good indicator

	1995	1996	1997	1998
Control series	50.0			90.0
Indicator series	43.5	53.5	67.0	79.0
Ratio	1.1494			1.1392

Example of imperfect indicator

	1995	1996	1997	1998
Control series	50.0			90.0
Indicator series	22.0	26.0	31.0	37.0
Ratio	2.2727			2.4324

Example of poor indicator

	1995	1996	1997	1998
Control series	50.0			134.0
Indicator series	30.0	33.0	36.0	39.0
Ratio	1.6667			3.43592

D.10. The next step in the interpolation process is to create values of the control–to–indicator ratio for missing years (see Table D.2). In the absence of any information, the best way is to assume constant growth in the ratio between the two observed points. In Table D.2, this was done for the first two indicator series. In the case of a poor indicator, manual adjustments to the estimated ratios are needed. For example, when interpolating employer tax payments using employment as an indicator, if it is known that the tax doubled in 1997, then the ratio series can be adjusted. One way to do so would be to cut the control series in half in 1998, estimate a smooth-growing ratio series, and then double the ratio in 1997 and 1998. Other procedures are possible, of course, depending on the nature of the change believed to have taken place in the relationship between indicator and control.

Table D.2 Interpolation example 2

Example of good indicator

	1995	1996	1997	1998	1999	Average growth
Control series	50.0			90.0		
Indicator series	43.5	53.5	67.0	79.0	91.0	
Ratio	1.1494	1.1460	1.1426	1.1392	1.1359	-0.29%
Interpolated control	50.0	61.3	76.6	90.0	103.4	

Example of imperfect indicator

	1995	1996	1997	1998	1999	Average growth
Control series	50.0			90.0		
Indicator series	22.0	26.0	31.0	37.0	42.0	
Ratio	2.2727	2.3247	2.3779	2.4324	2.4881	2.29%
Interpolated control	50.0	60.4	73.7	90.0	104.5	

Example of poor indicator

	1995	1996	1997	1998	1999	Average growth
Control series	50.0			134.0		
Adjusted control				67.0		
Indicator series	30.0	33.0	36.0	39.0	43.0	
Ratio	1.6667	1.6836	1.7006	1.7179	1.7354	1.01%
Adjusted ratio	1.6667	1.6836	3.4013	3.4359	3.4707	
Interpolated control	50.0	55.6	122.4	134.0	149.2	

D.11. The final step is to apply the newly estimated ratios to the indicator series to produce interpolated values for the control series.

D.12. When extrapolating, fewer choices may be available. If there is more than one observation for the control series to be extrapolated, the same technique can be used as for interpolation, simply extending the estimated ratios into the future (or the past). If there is only one observation of the control variable, in the absence of information to the contrary the same ratio should be used in extrapolation periods as exists in the observed period. If there is additional information, however, it should be used.

Suppose once again that the task is to extrapolate employer tax payments using employment as an indicator, but with only one observation of taxes. If it is known (perhaps from colleagues in the tax authority) that employer compliance with the law is improving each year, this can be built into the extrapolated ratio.

D.13. Note that the indicator series may be a combination of several variables. For example, employer spending on clinic services for employees may move not only with total employment but also with the price of medical care. In such a case, it would be appropriate to create an indicator series that is total employment multiplied by a price measure. The exact definition of the indicator series is not important (here the unit of measurement would be person-prices, an almost unintelligible concept); what is important is that it capture the forces driving the control variable.

Interpolating and extrapolating with an inflation measure or with population as an indicator

D.14. When there is no direct indicator of the movement of a control variable, it may be possible to use an inflation measure to fill in the missing values. This situation arises when the control variable is economic in nature or is highly sensitive to price conditions. Again taking the example of employer spending on clinic services for employees, if there is no indicator series available for employment, using a price measure may provide an adequate interpolation or extrapolation.

D.15. The same technique is used as when there is a bona fide indicator. As always, it is important to learn as much as possible about the control variable and the potential effects of policy and economic change upon it during the interpolation period. The goal is to make as informed an interpolation or extrapolation as possible. The stability of the control–to–indicator ratio should be examined, as it can help guide an assessment of the need to learn more about the control variable.

D.16. Another potential default indicator is population. This measure can serve as a proxy for many unobserved indicators, and is usually easily found. To the extent that a subset of the population can be used where appropriate, the product is better (for example, using counts of the population under the age of 15 years to interpolate spending on children's health).

D.17. As with "true" indicators, it may be desirable to combine population and price measures into a synthetic indicator. This latter has the potential to capture both volume and price changes over time.

Interpolating with multiple observations of the control variable

D.18. If there are more than two observations of the control variable, the linear interpolation methods described above may produce anomalies. Especially if the indicator series is not very good, that is, if there is fluctuation in the ratio of the control and indicator variable, the pattern of differences in percentage growth in the interpolated series and the indicator series will change abruptly at each control observation, as illustrated in Table D.3.[1] There is no stock solution to this problem. It is possible to estimate a polynomial that fits the observed ratios, although in many (if not most) cases the polynomial will exhibit undesirable traits such as rapid and wide fluctuations and negative values. Usually, the easiest solution is to adjust by hand the interpolation ratios around the middle observation of the control variable to smooth the transition between two adjacent interpolations. The most important point is that any manipulation of the data should be examined for reasonableness and anomalies, regardless of the techniques used.

[1] This may not be a problem if the indicator series has been recalibrated to the control series at the "census points". That situation nevertheless differs from the case being discussed, as in effect two separate indicator series are being used.

Table D.3 Interpolation example 3

Year	Control	Indicator	Ratio	Interpolated control	Percentage change		
					Indicator	Interpolated	Difference
1	100	100	1.000	100	---	---	---
2		105	1.051	110	5.0%	10.1%	5.1%
3		113	1.103	124	7.6%	12.9%	5.3%
4	135	117	1.154	135	3.5%	8.6%	5.1%
5		129	1.148	148	10.3%	9.7%	-0.6%
6		144	1.143	165	11.6%	11.1%	-0.5%
7		157	1.137	178	9.0%	8.5%	-0.5%
8		165	1.131	187	5.1%	4.6%	-0.5%
9		168	1.126	189	1.8%	1.3%	-0.5%
10	196	175	1.120	196	4.2%	3.7%	-0.5%

Interpolating without an indicator series

D.19. If there is no appropriate indicator and it is not appropriate to use price inflation or population growth as a guide to interpolating or extrapolating, some arbitrary method must be found to do so. Typically, this takes the form of linear or log-linear interpolation (extrapolation will be considered separately here, because in this situation it poses distinct problems).

D.20. The choice of linear or log-linear interpolation depends upon an understanding of the nature of the change in the control variable. If change is believed to be incremental in nature, then a linear model is appropriate. The process is simple: the aggregate change in the control variable is divided into the corresponding number of equally valued pieces and those pieces are added sequentially starting with the earlier value of the control variable (see Table D.4). On the other hand, if the underlying change in the control variable is believed to be a function of growth, a log-linear interpolation should be used. In this case, the average annual growth in the control variable is calculated using the formula $\exp\{\ln(C_t)C_0)/t\}$, where C_t and C_0 are the observed values of the control variable t years apart, exp and ln refer to the exponentiation and logarithm functions respectively. The resulting average annual growth rate is applied to develop the interpolated series, starting with the earliest value.

Table D.4 Examples of linear and log-linear interpolations

Example of linear interpolation

	1995	1996	1997	1998	Change or growth
Control series	50.0			90.0	40.0
Average change		13.3	13.3	13.3	13.3
Estimated control	50.0	63.3	76.7	90.0	

Example of log-linear interpolation

	1995	1996	1997	1998	Change or growth
Control series	50.0			90.0	21.6%
Average growth factor		1.2164	1.2164	1.2164	
Estimated control	50.0	60.8	74.0	90.0	

Extrapolating without an indicator series

D.21. Extrapolating without an indicator series poses additional challenges. If there are multiple observations of the control variable, the interpolation described in the previous paragraph can be performed and then extended through application of change or growth forwards (or backwards) in time. If one does not have the luxury of two observations, the increase or decrease must be established using only one's professional judgement (and that of one's colleagues). The simplest approach is to assume no change, but in most economies this is an unreasonable assumption regarding monetary variables or those that reflect demographic changes. This *Guide* can offer no rules of thumb to employ in such a situation, as action is so highly dependent upon the situational context. It is essential, however, that the decisions made be very thoroughly documented.

Interpolating or extrapolating a distribution

D.22. Sometimes, the control variable is a percentage distribution. For example, it may be necessary to interpolate the distribution of household spending among types of services. In these cases, extreme care should be exercised if the two sets of observations are from different surveys. Different surveys are likely to be associated with different patterns of recall bias and with other differences that can affect the reported distribution of spending. If there are significant shifts in this distribution over time, it is important to establish that this is a real phenomenon before mechanically interpolating between observation points.

D.23. In addition to the typical interpolation or extrapolation described above, there is an additional constraint imposed by percentage distributions. Namely, in each year the observations must sum to 100%.

D.24. In interpolation, this constraint can be handled in either of two ways. One way is to interpolate each of the percentages. The resulting series must then be summed and prorated year by year to sum to 100%. The other way to handle the constraint is to convert the percentage distribution to monetary values in each of the control years and then to interpolate those monetary values. The resulting series are summed year by year to get a monetary total, from which each year's percentage distribution is calculated. The choice of approaches depends upon the availability of monetary values in the control years. If they exist, the second approach – interpolating monetary values – is easier to perform.

D.25. For extrapolation, there is somewhat less choice available. Basically, the choices are to extrapolate a constant distribution or to adjust the distribution to reflect hypothesized differential experience. For example, if the price of one service is rising faster or slower than those of other services, one might hypothesize that the share of spending going to that service is rising or falling. If there is more than one control observation of the distribution, it may be advisable to consider the trend of the distribution between control observations when extrapolating. Whatever the decision, it is important to document the reasons for that decision.

Imputation

D.26. Extrapolating in the absence of an indicator is a form of imputation, one of the hardest and often most necessary of the skills employed in health accounting. As stated in this Guide, a cell in the national health accounts (NHA) tables cannot be left blank simply because hard data do not exist to populate it. Users depend upon the health accountant to form a picture, however fuzzy, of the country's health sector.

D.27. Imputation means making some informed guesses about reality. However, informed guesses are just that: they are informed, not merely shots in the dark. There are tools available to help with imputing values for a cell.

D.28. *Relationships in the country.* Knowing something about how the country's health system works can help in imputing missing values. For example, if the ratio of prescription drug costs to physician labour costs in outpatient clinics is 1:3, can the ratio in private physician practice be very different?

D.29. *Advice of knowledgeable people.* Help from people who know about the situation that gives rise to the information required for the cell in question can be invaluable. To continue the example from above, a physician who has worked both in outpatient clinics and in private practice can help resolve the question of whether the drug-to-labour ratio is higher, lower, or the same in the two settings.

D.30. *Relationships in other countries.* Health systems vary from country to country in very significant ways, but often there are overt or hidden similarities. Relationships among cells in health accounts for other countries may help to fill in missing cells in one's own accounts.

D.31. *The table itself.* As mentioned several times, the very nature of the formulation of a health accounts table can help to place upper and lower limits on the imputed amount. The strength of the row and column margins, and the reliability of the other cells in the row and column, all contribute to imputation for the missing cell.

Converting fiscal years to calendar years and vice versa

D.32. Very often data are encountered that are reported in a different time frame than the one being used. Most often this occurs when calendar year estimates are being prepared and the government reports data on a fiscal year basis, or when fiscal year estimates are being prepared and some of the data reflect calendar years. In the discussion that follows, it is assumed that the fiscal year runs from October 1 to September 30 (although the entire discussion can easily be modified to accommodate any fiscal year) and that calendar year estimates are required.

D.33. The easiest way to convert fiscal years to calendar years is to assume that equal expenditures (or whatever is being measured) occur in each month as is done in Table D.5. It follows that a portion of each fiscal year total can be allocated to a given calendar years on the basis of the number of months that fall in that calendar year. In the example in Table D.5, 9 out of 12 months in the fiscal year fall in the same calendar year; 3 months fall into the previous calendar year.

Table D.5 Example of converting fiscal year totals to calendar year totals

	Fiscal year[a] 1997	Fiscal year[a] 1998	Fiscal year[a] 1999	Calendar year total
Fiscal year total	120	180	240	
Calendar year 1996	30			N/A
Calendar year 1997	90	45		135
Calendar year 1998		135	60	195
Calendar year 1999			180	N/A

[a] 1 October to 30 September.

D.34. If price inflation or some other mechanism is believed to affect spending in each month, then the constant spending assumption is not a good one. In this case, a sort of indicator can be created that permits a change in the constant — proportions adjustment. For example, assume that price inflation is the only variable factor. A monthly price index can be derived either from published sources or by decomposing annual inflation into monthly figures. The sum of those monthly figures can then be used to determine into what proportions to split the fiscal year total. (Note in the example that inflation rates must be quite high in order to move the proportions far from 25:75.)

D.35. Without contiguous fiscal years of data to work with, this type of adjustment is impossible to make. There are, however, options in such cases. A fiscal year figure for the subsequent (or previous) period can be estimated, noting that any errors made in the estimate will appear in a diminished form in the calendar year estimate. If an inflation-adjusted method has been used, the monthly series can be extended forward for the appropriate number of months and the relative sums used to estimate values for the remaining months of the calendar year. For example, in the 90% inflation model in Table D.6, extending the monthly series three more months produces values of 2.004, 2.115 and 2.231. Those three values sum to 6.350, which is equal to 36.7% of the current fiscal year. So to approximate the calendar year one would take 80.7% of the fiscal year total plus an additional 36.7% of the fiscal year. In either case, the conversion should be re-estimated as soon as a new fiscal year figure becomes available.

Table D.6 Example of converting fiscal year totals to calendar year totals

Fiscal year inflation	Fiscal year inflation 1 October to 30 September		
	15%	45%	90%
Average monthly growth factor	1.0117	1.0314	1.0549
Oct	1.012	1.031	1.055
Nov	1.024	1.064	1.113
Dec	1.036	1.097	1.174
Jan	1.048	1.132	1.239
Feb	1.060	1.167	1.307
Mar	1.072	1.204	1.378
Apr	1.085	1.242	1.454
May	1.098	1.281	1.534
Jun	1.111	1.321	1.618
Jul	1.124	1.363	1.707
Aug	1.137	1.406	1.801
Sep	1.150	1.450	1.900
Oct-Dec sum	3.071	3.193	3.342
Jan-Sep sum	9.883	11.567	13.938
Total	12.954	14.759	17.280
Prior calendar year proportion	23.7%	21.6%	19.3%
Current calendar year proportion	76.3%	78.4%	80.7%

D.36. When there are several contiguous annual figures to be adjusted, there are a number of techniques that can be used to make the adjustment. These techniques have been used extensively in the preparation of national income and product accounts. Many countries keep quarterly measures of gross domestic product and related economic aggregates, and interpolation techniques have been developed to ensure consistency between these quarterly estimates and the annual estimates of the same aggregates. The Appendix to this Annex reproduces a chapter from a 1979 OECD report on quarterly national accounts in which some of these techniques are discussed. Advances in computing power have made possible very sophisticated techniques, but in practice some of the techniques developed for manual use have stood the test of time and continue to be used today.

Appendix: Converting annual data to quarters

In cases where two or more contiguous years need to be converted from a calendar basis to a fiscal basis or vice versa, it is appropriate to use some form of interpolation that considers the years as a group. Despite recent innovations in autoregressive statistical techniques, the Bassie technique is adequate for the purposes of national health accounts. The text that follows, which describes the Bassie technique, was originally published by OECD in 1979, as "Reconciliation of quarterly and annual national accounts," chapter 2 of *Quarterly national accounts – a report on sources and methods in OECD countries.* Additional material can be found at URL http://www.oecd.org/std/nahome.htm

Introduction

Almost all countries try to keep their quarterly national accounts strictly consistent with their annual estimates. No difficulties arise when the annual figures are based on the same sources as the quarterly estimates, but in the vast majority of cases the annual accounts are based on different, more reliable, data than the quarterly figures. In these circumstances it is generally necessary to adjust the quarterly figures to bring them into line with the more accurate annual estimates. In general this reconciliation is done once a year when annual national accounts become available as well as when previous years are revised. The various procedures which have been devised to make this adjustment are of two sorts depending on whether the quarterly estimates have been obtained by trend extrapolation of the latest annual figures (i.e. without any related series being available) or whether they have been obtained using a related series as a quarterly indicator.

Adjustment of quarters when no quarterly indicators are available

Lisman and Sandee (1) and later Boot, Feibes and Lisman (2) have developed specific methods for generating quarterly flows which are consistent with the annual data in the absence of any related quarterly series. Lisman and Sandee assume that the quarters (Y_{ti}) depend upon three annual flows: this year's flow (Y^*_t), last year's flow (Y^*_{t-1}), and next year's flow (Y^*_{t+1}), according to the following linear transformation:

$$\begin{vmatrix} Y_{t,1} \\ Y_{t,2} \\ Y_{t,3} \\ Y_{t,4} \end{vmatrix} = \frac{1}{4} A \begin{vmatrix} Y^*_{t-1} \\ Y^*_t \\ Y^*_{t+1} \end{vmatrix}$$

To determine the coefficients of the matrix A Lisman and Sandee impose a number of restrictions, such as that when the three annual data are not on a straight line they are assumed to lie on a sinus curve. These restrictions determine the following coefficients of the matrix which can then be used to generate quarterly estimates consistent with the annual data:

$$A = \begin{vmatrix} 0.291 & 0.793 & -0.084 \\ -0.041 & 1.207 & -0.166 \\ -0.166 & 1.207 & -0.041 \\ -0.084 & 0.793 & 0.291 \end{vmatrix}$$

One of the drawbacks of this method is that quarterly interpolations for the first and the last year are not estimated. Boot, Feibes and Lisman proposed to minimise the square of the first differences of the quarterly flows, (Y's):

$$\sum_{j=2}^{4N} \left(Y_j - Y_{j-1} \right)^2$$

under the N constraints:

$$\sum_{j=4i-3}^{4i} Y_j = Y^* \; (i = 1, 2,....N)$$

This problem is solved through the introduction of the Lagrange multiplier λ as follows:

$$\begin{vmatrix} B & C' \\ C & O \end{vmatrix} \begin{vmatrix} Y \\ \lambda \end{vmatrix} = \begin{vmatrix} O \\ Y^* \end{vmatrix}$$

where $B=2A'_{(N)} A_{(N)}$

$$\begin{vmatrix} 2 & -2 & 0 & 0 & 0 & .. & 0 & 0 & 0 \\ -2 & 4 & -2 & 0 & 0 & .. & 0 & 0 & 0 \\ 0 & -2 & 4 & -2 & 0 & .. & 0 & 0 & 0 \\ .. & .. & .. & .. & .. & .. & .. & .. & .. \\ 0 & 0 & 0 & 0 & 0 & .. & -2 & 4 & -2 \\ 0 & 0 & 0 & 0 & 0 & .. & 0 & -2 & 2 \end{vmatrix}$$

and C=

$$\begin{vmatrix} 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & .. & .. & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & .. & .. & 0 & 0 & 0 & 0 \\ .. & .. & .. & .. & .. & .. & .. & .. & .. & .. & .. & .. & .. & .. \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & .. & .. & 1 & 1 & 1 & 1 \end{vmatrix}$$

A_N being the (4N-l)X4N matrix which transforms the Ys into their first differences:

$$A_N = \begin{vmatrix} -1 & 1 & 0 & .. & .. & 0 & 0 \\ 0 & -1 & 1 & .. & .. & 0 & 0 \\ .. & .. & .. & .. & .. & .. & .. \\ 0 & 0 & 0 & .. & .. & -1 & 1 \end{vmatrix}$$

and C is the NX4N matrix which sums up the quarters.

The above method leads in general to very reasonable results except in one aspect: a continuously rising trend does not give a continuously rising straight line, but a line whose slope tapers off in the first and last year. This is why Boot, Feibes and Lisman also proposed an alternative criterion, which consists of minimizing the sum of squares of the second differences:

$$\sum_{j=2}^{4N} (\Delta Y_j - \Delta Y_{j-1})^2 \text{ where } \Delta Y_j = Y_{j+1} - Y_j$$

subject to the constraints:

$$\sum_{j=4i-3}^{4i} Y_j = Y_1^* \ (i = 1, 2,....N)$$

The only difference between the two methods is that the B matrix is replaced by a matrix D where: $D=2A'_{(N)} A'_{(N-l)} A_{(N-l)} A_{(N)} =$

$$\begin{vmatrix} 2 & -4 & 2 & 0 & 0 & 0 & \dots & 0 & 0 & 0 \\ -4 & 10 & -8 & 2 & 0 & 0 & \dots & 0 & 0 & 0 \\ 2 & -8 & 12 & -8 & 2 & 0 & \dots & 0 & 0 & 0 \\ & 2 & -8 & 12 & -8 & 2 & \dots & 0 & 0 & 0 \\ & & & & \dots & \dots & \dots & \dots & \dots & \dots \\ & & & & 2 & -8 & 12 & -8 & 2 & 0 \\ & & & & & 2 & -8 & 12 & -8 & 2 \\ & & & & & & 2 & -8 & 10 & -4 \\ & & & & & & & 2 & -4 & 2 \end{vmatrix}$$

Finally there exists another general method utilised to interpolate quarterly data within annual data. This consists in using the so-called "cubic spline functions" (3) which generate smooth and minimum curvature curves through discrete observations. More specifically each segment of the curve (the interval between two observations) is a third degree polynomial whose first and second derivatives are continuous at the linking points (knots). The cubic spline function may be written as follows:

$$G(t) = a + b(t-t_0) + \sum_{j=0}^{n} c(t-t_j)^3$$

with

$$(t\text{-}t_j)^3 = (t\text{-}t_j)^3 \text{ for } t \geqslant t_j$$
$$\text{o otherwise}$$

One of the drawbacks of this method is, however, that it necessitates an arbitrary estimation of the functions first derivative at both ends of the series to be interpolated.

The methods described above generate quarterly estimates by generating smooth curves through annual points. The quarterly estimates are, however, purely arbitrary numbers, and in principle, they have no connection with any observed events in the real world. This said, however, the quarterly estimates may in practice often be quite close to seasonally adjusted estimates obtained by using quarterly indicators.

Adjustment of quarters when quarterly indicators are available

When the quarterly flows are based on a related quarterly series, there is almost always found to be a difference between the sum of the quarters and the annual figure. If the quarterly figures are adjusted to the annual level on a simple pro rata basis there will then be a discontinuity in the series between the fourth quarter of the preceding year and the first quarter of the current year.[1]

Bassie (4) was the first to devise a simple and convenient method of constructing a quarterly series whose quarterly movements would closely reflect those of a related series, and which would ensure a smooth progression between successive quarters, while maintaining consistency with the annual totals.

Bassie resolved the problem as follows. As a starting procedure, the first year's data for the quaterly indicator (X) are adjusted pro rata so that their annual value (X*) equals the annuals series cY*) for which quarterly estimates are required. In year 2 the difference between the annual movements of the two series is assumed to consist of a bias (K) in the series X. Bassie proposed to divide K between the quarters in such a way as to preserve the quarterly movements, including the fourth quarter to the first quarter of next year, while preserving at the same time the annual totals.

Bassie's method assumes that the correction for any quarter (Kq) is a function of time Kq=f (t), and that f (t)=a+bt+ct^2+dt^3. The method then stipulates the following four conditions:

a) the average correction in year 1 is equal to zero, $\int_0^1 f(t)dt = o$

b) the average correction in year 2 is equal to the bias K, $\int_1^2 f(t)dt = k$

[1] This is sometimes referred to as the "step problem." For a description of the problem as it occurs in the Canadian national accounts, see *National Income and Expenditure Accounts, Vol. 3* (Catalogue 13 - 549E) Statistics Canada, Ottawa. 1975.

c) at the start of year 1 the correction is zero, so as not to disturb the relationship between the first quarter and the fourth quarter of year 0,

$$f(0) = 0$$

d) at the end of year 2 the correction is neither increasing nor decreasing. All the correction has been applied and no bias remains.

$$\frac{df(2)}{dt} = 0$$

These four conditions, which reduce to:

$$a + \frac{b}{2} + \frac{c}{3} + \frac{d}{4} = 0$$

$$a + \frac{3b}{2} + \frac{7c}{3} + \frac{15d}{4} = K$$

$$a = 0$$

$$b + 4c + 12d = 0$$

enable the computation of a, b, c and d, then:

$$Kq = f(t) = K\,(-1.125t + 2.156\,t^2 - 0.625t^3)$$

and finally the correction $q's = \frac{f(t)}{K}$ equal for the first year:

first quarter	-0.09814453
second quarter	-0.14404297
third quarter	-0.00830078
fourth quarter	+0.25048828

and for the second year:

first quarter	+0.57373047
second quarter	+ 0.90283203
third quarter	+1.17919922
fourth quarter	+1.34423828

The process is continued for years 2 and 3. The quarterly Bassie correction factors of the "first year" are now applied to year 2 (which has already been corrected once), and the quarterly Bassie correction factors of the "second year" are now applied to year 3. The procedure is repeated for years 3 and 4, etc.

It should be noted that the biases between the two series (K) may be expressed either in an additive form:

$$K = Y^* - X^*$$

or in a multiplicative manner:

$$K = \frac{Y^*}{X^*} - 1$$

Because of the irregularity that sometimes results from the additive method it appears that the multiplicative method is preferable. However, this latter method does not yield an exact correction and a small amount of pro rating is necessary at the end of the computation.

Vangrevelinghe (5) has suggested another method. He proposed first, to interpolate by Lisman and Sandee's method the series X* and Y* to generate quarterly estimates $\hat{X}$ and $\hat{Y}$. He then computes a least squares regression for the annual data: $Y^*_i = a + bX^*_i$. Finally, the interpolated final Y's are arrived at as:

$$Y_j = \hat{Y}_j + b(X_j - \hat{X}_j)$$

This procedure has the same shortcoming as the Lisman and Sandee method through the loss of eight quarterly figures - those of the first year and those of the last year.

Finally, Ginsburg (6) and Nasse (7) have recently proposed two methods which although apparently different generate identical results. Both use Vangrevelinghe's idea but instead of Lisman and Sandee they use the Boot et al. method.

Differences between the various interpolations

Theil (8) has devised a number of statistics which can be used for analysing the reliability of the above methods of interpolation. First there is his inequality coefficient:

$$U = \frac{\sqrt{\frac{I}{n}\sum (P_i - A_i)^2}}{\sqrt{\frac{I}{n}\sum P_i^2} + \sqrt{\frac{I}{n}\sum A_i^2}}$$

where the P_i are for instance estimates obtained by interpolation and the A_i are actual figures. The smaller the U the better the fit between the interpolations and actuals.

U can be decomposed into three terms which sum to unity:

Um =the proportion of inequality due to unequal central tendency (bias) = $\frac{\overline{P} - \overline{A}}{D}$

Us =the proportion of inequality due to unequal variation = $\frac{S_p - S_a}{D}$

Uc =the proportion of inequality due to imperfect covariance = $\frac{2(1 - r) S_p S_A}{D}$

where $\overline{P}$, SP, $\overline{A}$, SA are respectively the averages and the standard deviations of Pi and Ai and where:

$$D = \sqrt{\frac{I}{n} \Sigma P_i^2} + \sqrt{\frac{I}{n} \Sigma A_i^2}$$

The most desirable values of the three are: $U_m = U_s = 0;\ U_c = 1$

If
The second group of statistics proposed by Theil deal with the turning points:
m1 = the number of turning points correctly predicted,
m2 = the number of cases where turning points are incorrectly predicted,
m3 = the number of cases where turning points are, incorrectly, not predicted.

Theil defines:

$$Q_1 = \frac{m_2}{m_1 + m_2}$$

$$Q_2 = \frac{m_3}{m_1 + m_3}$$

Small Qs indicate successful predictions.

In order to compare the different methods of interpolation described above Ginsburg (6) used them to generate quarterly estimates of American GNP (seasonally adjusted) at 1958 prices. He used the seasonally adjusted quarterly index of industrial production for those methods requiring a related series. He then tested the interpolations against actual quarterly GNP using the Theil statistics described above. His results are reproduced in Table 1 below with the addition of results for the Bassie method which was not considered in Ginsburg's study.

Table 1. Comparison of interpolations according to the different methods

	n	U	Q1	Q2
Lisman-Sande	31	0.42	0.50	0.90
Boot-Feibes-Lisman	39	0.36	0.75	0.79
Bassie	35	0.39	0.25	0.21
Vangrevelinghe	31	0.34	0.17	0.00
Nasse, Ginsburg	39	0.36	0.21	0.07

The additive method has been used for the Bassie interpolations, but it is possible that the multiplicative method would have produced better results. The comparison seems to indicate that the Vangrevelinghe method is the best, although eight observations are lost. From a computational point of view the old Bassie method is the easiest. It is interesting to note that in terms of the U statistics the differences between the methods are not very marked with the purely mathematic methods giving results about as good as the methods using the related series. However, the Q statistics show clearly the superiority of the methods using related statistics in detecting turning points.

Practical problems and actual procedures utilized

In some countries (Australia, Japan, Sweden, United Kingdom) an important number of annual flows are directly generated by the quarterly flows; however, in most countries, when the annual estimates are not derived as the sum of quarterly accounts, use is made of both linear trend extrapolation, and indicator series, and it becomes necessary to adjust the estimated quarterly data to the annual accounts whatever the method used. The estimates are often revised either because the annual data are revised or because the method itself implies an annual revision of the preceding year's four quarters (e.g. Bassie) or an annual revision of all preceding quarters (e.g. Nasse).

When no indicators are available, most countries use one of the other methods described above, more particularly, with the United Kingdom, the cubic spline program is also used to interpolate annual figures e.g. of farming income and stocks. The Lisman-Sandee method is applied by hand e.g. for certain taxes and subsidies. Quarterly values of the total rateable value of property are obtained by straight line interpolation between estimates of the value at 31st March each year. The quarterly rateable values are used for consumers' expenditure on rates and imputed rent on owner-occupied dwellings. It should be noted that this example of interpolation is between values that remain as points in the final series. The Central Statistical Office has recently prepared a computer program (again based on cubic splines) to fit smooth curves between fixed values. The aim is to find quarterly indicators for those series at present calculated in this purely arbitrary manner e.g. an improved method is being sought for tracking by quarters the recent recovery in farmers income following a good harvest. France uses both the Lisman and Sandee and the Boot et al methods. In Australia, the interpolation method is similar to that of Lisman and Sandee, the main characteristics being that the sum of the four quarters equals the annual figure, and equal annual increases produce equal quarterly increases. The matrix corresponding to /A/ in the Lisman and Sandee method is:

$$\begin{vmatrix} 0.25 & 0.875 & -0.125 \\ 0 & 1.125 & -0.125 \\ -0.125 & 1.125 & 0 \\ -0.125 & 0.875 & 0.25 \end{vmatrix}$$

Japan uses the Lisman and Sandee method but has managed to eliminate the shortcomings of losing eight quarters - those of the first and the last year.

In the majority of cases, when indicators for quarters are available, the basic methodology is directly related to the Bassie method (United States, Canada, Italy, Sweden). France is using the Nasse method. In the United Kingdom, in order to adjust quarterly values to independent annual totals e.g. where quarterly sample data are superceded by the results of an annual total, or in the final stage of seasonal adjustment, to preserve annual totals the adjustments are often done manually. However, during seasonal adjustment and in certain other cases a computerised method is used based on "cubic splines" to allocate smoothly the discrepancy between the sum of quarterly values and the required annual total. This approach eliminates the "step problem" and is relatively easy to operate with a computer library routine. The method is iterative; each iteration spans five years and moves on one year from the previous iteration. Hence, a minimum of five years' data is needed; revisions to the quarterly data are possible; however, the quarterly interpolation of the latest years are not based on a complete number of iterations. Stocks of some service industries are produced quarterly by manual interpolation in line with indicators such as turnover e.g. motor traders, catering trades.

However, it seems that a perfect method is yet to be found and even the old Bassie method poses problems. In the paragraphs below, some of the specific problems as well as the steps which can be taken to minimize the impact, are described.

Problem Type 1

The iterative version of the Bassie works best when the correction (K) is small and random.[2] The first type of problem occurs when the correction is biased in one direction and the ratio of the mean of the correction to its standard deviation is large. In this case, residual seasonality is introduced into the interpolated results. The Bassie weights, integrals of the correction function which are multiplied by K to derive the correction factors, are the same for a specific quarter of each year; thus, when K is nearly a constant the correction factors become "reverse seasonal factors", building seasonal variation into the interpolated series. The problem also occurs when the correction is biased in one direction over the first part of the interval and biased in the opposite direction over the second part, that is, when the correction has a long, smooth cycle. This type of problem can be detected in either of two ways: by inspection of the K's for the interpolation period, or by seasonal adjustment of the interpolated series. To correct for this problem, the indicator series can be modified to reflect the differences between its annual growth rate and that of the control, and thus be brought more into line with the control. The modification should be done in a manner that does not distort changes in the indicator series from the fourth to the first quarter. There is an alternative which would solve the seasonal problem, but which might result in an interpolated series with little resemblance to the indicator series: one could run the Bassie using a seasonally unadjusted indicator series and then seasonally adjust the interpolated series.

[2] In this context, the correction is
$K_i = [A_i \div (f_{i-1} \sum_j q_{ij})] - 1$ i=2, … N where:

A_i is the annual control for the *i* th year;

q_{ij} is the value of the indicator series in the *j* th quarter of the *i* th year; and

f_{i-1} is the ratio of the value of the interpolated fourth quarter and the indicator fourth quarter for the *i–1* th year. ($f_1 = A_1 \div \sum_j q_{1j}$)

N.b. that the correction is not the ratio of annual growths of the control series and the indicator series:
$K_i \neq [(A_i \div A_{i-1}) \div (\sum_j q_{ij} \div \sum_j q_{i-1,j})] - 1$

Problem Type 2

This problem occurs if the correction (K) is large and random. It is caused by a poor indicator of the annual movement of the control, and results in an interpolated series ("bassie output") which exhibits large swings which appear neither in the quarterly movement of the indicator, nor in the annual movement of the control.

This type of problem can be identified by inspection of the ratio of the values of the quarterly bassie output and the quarterly indicator series. There is no known methodological remedy for this problem, since it merely is a reflection of the poor quality of the indicator series. One can either adjust the series judgementally or choose a better indicator.

Problem Type 3

The two-year progress of the iterative bassie can obscure the nature of the discrepancy between control and indicator series. This problem occurs when there is a sharp, one-time divergence between the growth in the control series and that in the indicator series. If the problem is due to some unusual event in the indicator series, then one would want the correction restricted solely to the interpolated quarters of that year. However, the bassie will spread corrections over three years automatically: the years before and after the divergence as well as the problem year. It should be noted that this problem would not be revealed by inspection of K's, which would exhibit damped oscillation about zero, but only by graphic inspection of the two data series. To solve this problem, either the indicator or the interpolated series should be adjusted.

Problem Type 4

This type of problem can occur when the last quarter of the interpolated series is used as the "take-off" point for an estimate of the next year's control. Usually this estimate is made by extrapolating the fourth quarter value of the interpolated series by the growth in the indicator series. The problem arises if the correction factor for the final quarter differs substantially from those for the other three quarters (which occurs when the final year's K is large). When K is negative (positive), even if the annual growth of the indicator series were to predict the control growth exactly the extrapolated series would underestimate (overestimate) the annual series. Normally, this can be avoided by constructing "year-ahead correction factors" which compensate for the low (high) take-off point.

Despite the problems described above, it appears that the Bassie method is well suited for most uses. However, countries are studying alternatives, such as methods using ARIMA (auto-regressive integrated moving average) techniques. So far, in studying the different methods, it is their judgement that a poor indicator series creates problems regardless of the interpolation method. Thus, they put most of their energy into improvement of the quality of the indicator series, through changes in the collection of data, identification of biases in the indicator series, and adjustment of indicator series for know biases during the extrapolation period.

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Adjusting for price inflation

D.37. When preparing a time series of figures on health spending, it is often useful to prepare a set of estimates that remove the effects of price inflation. There is no commonly held standard for doing this, however, as the choice of price inflation measure used depends upon the question to be answered. Typically, one of three types of inflation measures is used, each of which will be discussed in turn.

Gross domestic product price index

D.38. The gross domestic product price index (GDP-PI) measures economywide inflation. Prices of individual goods and services are combined into a composite measure, using total spending on each of those goods and services as weights. The GDP-PI covers consumer goods and services, investment goods, government services, imports and exports. In this respect, it is the most complete measure of price changes facing a nation.

D.39. Using the GDP-PI to deflate health expenditures produces a measure of what economists call the "opportunity cost" of health spending. The opportunity cost of a purchase is the goods or services that could have been purchased or consumed instead. So the change in GDP-PI-deflated health spending reflects the change in the size of the bundle of other goods and services that could have been purchased with the same amount of money.[2]

D.40. There are two advantages of using the GDP-PI to deflate health spending. The first advantage is that the index is almost certainly available. The country's central statistical authority — or whoever prepares GDP estimates — will have already prepared it as part of the larger system of national accounts. The second advantage is that the universal availability of the index makes it ideal for international comparisons.

Consumer price index

D.41. Like the GDP-PI, a consumer price index (CPI) measures the change in the price of a bundle of goods and services. Where the GDP-PI measures economywide prices, however, a CPI only measures prices of goods and services purchased by households.

D.42. Caution should be exercised when interpreting the results of CPI deflation of health spending. Because households do not directly shoulder the expense of all health care spending, it may not be appropriate to deflate all spending by the index. Deflation by the GDP-PI produces a result that can be described in words, but the corresponding description of CPI-deflated spending is less satisfying. Change in CPI-deflated health spending describes the change in the size of the bundle of consumer goods and services that could have been purchased instead. Since not all health spending is at the disposal of households, this concept may not be a very useful one for policy-makers. It is appropriate to deflate household spending by a CPI — one could even deflate household funds in the source-of-funds dimension. Unfortunately, the common practice of deflating all health spending by a CPI produces a measure that is poorly defined conceptually.

[2] To be really precise, deflation should be done using the GDP-PI excluding health care. However, when health is a small proportion of total GDP and when price inflation in the health care sector is not much different from that in the rest of the economy, using the total GDP-PI does not damage the analysis and reduces its cost substantially. Developing a price index for GDP less health can be a long-term project for the health accounts project or for the country's statistical authority.

Own-price deflation

D.43. Own-price deflation measures a different concept from the opportunity-cost types of GDP-PI and CPI deflation. Here the goal is to track changes in the quantities of goods and services consumed. Own-price deflation starts with the economic identity $E_{it}=P_{it}Q_{it}$ where E is expenditure, P is price, Q is quantity, is the good or commodity, and t is the time period. To remove the effects of price inflation from each expenditure amount, that expenditure is divided by a price index P_{it}/P_{i0}. Algebraically, this produces $P_{i0}Q_{it}$, which can be described as current period quantities valued at base year prices. The ratio for any two years values reflects the change in the quantity of the good or service consumed.

D.44. To combine various goods and services into a single measure, some way must be found to show their relative weight. This relative weight is established by its value reflected by its market (or market-like) price in the base period P_0. For example, if a physician visit cost 20 in 1997 and a hospital inpatient-day costs 60, then a hospital inpatient-day is said to count 3 times as much as a physician visit in the volume measure. Thus, own-price deflation is done by first deflating expenditure for each good or service by its own price, and then summing these deflated figures. In the base period, the deflated figure will equal the nominal figure.

D.45. There are two practical problems in performing own-price deflation. First, there must be a reasonably valid market price for each good or service. Some of these are more difficult to obtain than others. Probably hardest of all is a price index for the net cost of insurance, which is itself a bundle of services. The second problem is that most price measures are afflicted by an inability to remove the effects of quality, that is, to divide E into its strict P and Q components. To the extent that the price index P_t/P_0 includes changes in price resulting from changes in the quality of the good or service, own-price deflation is inaccurate. Measuring quality is difficult in any circumstances, but particularly so for services and especially for health services.

D.46. A variant of own-price deflation is to deflate for input prices. This is especially useful if no good market price index is available for the good or service in question (as is the case for administration, for example). If the mix of factors of production used to create the service — labour, utilities, etc. — is known, a price index can be built using the prices of those inputs and a base year mix of the input units.

D.47. The whole area of price adjustment for services is evolving rapidly. The process is subject to considerable debate and uncertainty, and should not be approached lightly. It cannot be avoided in cases where values of interest are for a time period other than that being estimated. A more complete discussion of price, quantity, and quality measurement is found in Chapter 7 of the OECD-SHA manual, and in Chapter 16 of the SNA93 manual.

Adjusting currency values

D.48. When making comparisons across countries or — occasionally — using reports of external organizations to prepare health accounts, some way is needed to convert currency values. There are two methods of making this conversion: use of exchange rates, and use of purchasing power parities. Exchange rates show the explicit conversion of one denomination into another. Purchasing power parities, as their name suggests, compare the resources commanded by units of the two currencies.

D.49. A discussion of these concepts is beyond the scope of this *Guide*, so a simple rule of thumb is offered here: when comparing the health accounts of two countries, it is best to use purchasing power parities. When converting external resources for use in the country's health accounts, it is best to use exchange rates. The reader is directed to the SNA93 (paragraphs 16.78 onwards) for more discussion of international price and volume indices.

Glossary

Glossary

This glossary aims to clarify terms used in the *Guide*. In many cases, the meanings given are specific to the *Guide* and as it relates to national health accounts (NHA). It does not necessarily apply in a general context.

Account
A tool which records, for a given aspect of economic life: (a) the uses and resources; or (b) the changes in assets and the changes in liabilities; or (c) the stock of assets and liabilities existing at a certain time. Transactions accounts (T-accounts) include a balancing item which is used to equate the two sides of the accounts (e.g. resources and uses) and which is a meaningful measure of economic performance in itself.

Accounting
A systematic recording and display of economic transactions in summary form, that conforms to accepted definitions and rules.

Accrual method
An accounting method in which expenditures are attributed to the time period during which the economic value was created, not to the time period during which actual cash disbursements may take place. (See also **Cash method**.)

Aggregates
Summary measures of a type or class of economic activity. Some aggregates are found by summing up individual transactions; others are found by summing up the cost of producing the services or goods in question.

Ambulatory and outpatient health care
Medical and paramedical services delivered to outpatients. An outpatient is not formally admitted to the facility (physician's private office, hospital outpatient centre or ambulatory care centre) and does not stay overnight. An outpatient is thus a person who goes to a health care facility for a consultation or treatment, and who leaves the facility within several hours of the start of the consultation without being "admitted" to the facility as a patient.

Ancillary services
A variety of services such as laboratory tests, diagnosis imaging and patient transport, mainly performed by paramedical or medical technical personnel with or without the direct supervision of a medical doctor.i

Audit [1]
The legal requirement for a corporation to have its balance sheet, financial statement, and underlying accounting system and records examined by a qualified auditor so as to enable an opinion to be formed as to whether the financial statement accurately represent the company's financial condition and whether they comply with relevant statutes.

Autonomous
Independent. For example, an autonomous hospital has authority, powers, duties and responsibilities (including functions related to personnel, budgeting and management) that are exercised free from the direction and supervision of higher authorities.

Base period [2]
The period that provides the weights for an index is described as the base period.

Beneficiary
An individual (or group of individuals) who receives benefits from or is covered by an insurance policy or other health care financing or delivery programme.

Benefit package
In the context of an insurance scheme, a defined and agreed-upon set of services or advantages (whether monetary or in kind) to which people enrolled in the scheme are entitled.

Benefits
Generally, gains (whether material or not) that accrue to an individual or a community as the result of some action. The term also has a specific meaning in the context of health systems: the health services and other advantages (in money or in kind) to which people are entitled by virtue of meeting particular criteria (typically, enrollment in an insurance scheme)

Bottom-up
An estimation method where figures are estimated for elements of an aggregate and then added up to generate the estimate of the total. (See also Top-down.)

Budget
A detailed plan for the future showing how resources will be acquired and used during a specific time period, expressed in formal, measurable terms.

Calendar year
From 1 January to 31 December.

Capital
In health accounting, capital usually refers to the physical assets (land, buildings and equipment) owned by or available to the entity in question. Less frequently in health accounting it can also refer to the financial assets available to the entity, but in such cases that is made specific. Capital can be measured at its "book value" (its cost at the time of its creation) or at its replacement value (the current cost of replacing it). It can also be measured either gross (its original value) or net (taking into account the wear and tear on it and its obsolescence).

Capital investment
Investment in health care facilities and equipment creates assets that typically are used over a long period of time. The current total of capital investment expenditure is referred to as gross capital formation.

Capital transfers
Transactions in cash or in kind, where the ownership of an asset is transferred from one institutional unit to another, or where cash is transferred to enable the recipient to acquire another asset, or where the funds realized by the disposal of another asset are transferred.

Capitation [3]
A method of paying medical doctors a fixed flat amount fee per patient registered with them. It is generally based on the average health care cost of the registered patient population; the capitation amount is sometimes adjusted for the age of the patient.

Cash method
An accounting method in which expenditures are attributed to the time period during which actual cash disbursements take place. (See also **Accrual method.**)

Census [2]
A census is a survey conducted on the full set of observation objects belonging to a given population or universe.

Coinsurance
A form of **copayment** in which the consumer pays a fixed amount or a percentage of the charges for each good or service rendered.

Confidence interval [4]
The interval which contains the true value of a parameter of the population sampled with a given probability, for example 95 per cent, as inferred from a sample. The width of the confidence interval is an increasing function of the probability required, an increasing function of the sample standard deviation, and a decreasing function of sample size.

Constant prices
Prices from a given base period, used to adjust a time series of actual financial transactions to eliminate the effect of price inflation or deflation.

Copayment
An amount under a health insurance scheme for which the insured person is liable. Copayments take the form of **deductibles** and/or **coinsurance.**

Cost-sharing [3]
Usually refers to a method of financing health care that involves some portion of the expenditure falling directly on the user. The cost is then shared between user and employer, government, donor, taxpayer, insurance agency, etc.

Current cost accounting
A valuation method whereby assets and goods used in production are valued at their actual or estimated current market prices at the time the production takes place. (It is sometimes described as "replacement cost accounting").

Current expenditure
Day-to-day spending, i.e. spending on recurring items. This includes salaries and wages that keep recurring, and spending on consumables and everyday items that get used up as the good or service is provided.

Current transfers
All transfers that are not transfers of capital that directly affect the level of disposable income and should influence the consumption of goods or services.

Deductible
A form of **copayment** in which the consumer is responsible for a fixed amount of charges before the insurance scheme begins to pay. Typically, deductibles are established as an annual amount.

Deflation
In social accounting, removal of the effect of price inflation from expenditure amounts. This is achieved by typically dividing the expenditure amount by a price index.

Deflator [5]
An implicit or explicit price index used to distinguish between those changes in the money value of gross national product which result from a change in prices and those which result from a change in physical output.

Delphi techniques
Methods of generating information by consulting with experts on the subject to form a picture of the process or system under examination. Formally, the Delphi method is an exercise in group communication among a panel of geographically dispersed experts. The technique allows experts to deal systematically with a complex problem or task. The essence of the technique is fairly straightforward. It comprises a

series of questionnaires sent either by mail or via computerized systems to a pre-selected group of experts. These questionnaires are designed to elicit and develop individual responses to the problems posed and to enable the experts to refine their views as the group's work progresses in accordance with the assigned task. The main point behind the Delphi method is to overcome the disadvantages of conventional committee action. Anonymity, controlled feedback, and statistical response characterize Delphi. The group interaction in Delphi is anonymous, in the sense that comments, forecasts, and the like are not identified as to their originator but are presented to the group in such a way as to suppress any identification.

Depreciation [6]
The anticipated reduction in the value of an asset over time that is brought about through physical use or obsolescence.

Diagnosis-related group (DRG)
A group of cases arranged according to their diagnosis, determined using the International Classification of Diseases. DRGs are typically formed to group similar conditions or similar levels of resource intensity.

Double counting
Including an expenditure in more than one category in the accounts for a given stage of the health care system, for example, counting co-payment amounts as both insurance activity and as out-of-pocket activity. By its nature, double counting overstates the actual expenditure on health care.

Enterprise
An institutional unit in its capacity as a producer of goods and services.

Entity
An economic actor in the health system. Entities can be governments, businesses, organizations, individuals, families, etc.

Equity [5]
Fairness or justice. This concept is of importance to economists in a number of situations. For example, judgements of economic arrangements sometimes distinguish issues of efficiency — the production of maximum output — from issues of equity — the manner in which that output is distributed.

Exchange rate [1]
The price of a currency expressed in terms of another currency.

Expenditure
In national accounting, expenditure refers to the economic value of goods or services produced or consumed. For **market production**, this value is established by the transaction prices observed in the market. For **nonmarket production**, the value is established at the cost of resources (labour, supplies, etc.) used to produce the good or service in question.

External resources
Funds or services in kind that are provided by entities not part of the country in question. These resources may come from international organizations, bilateral arrangements with another country, or foreign nongovernmental organizations.

Extrabudgetary entities
Organizations that are acknowledged to be essentially government entities but whose budgets do not appear in the traditional calculation of receipts and expenditures that determine the government budget deficit or surplus. (See also **Parastatal enterprise.**)

Extrapolate [4]
To extend an apparent pattern beyond the actual observations on which it is based. Extrapolation can be

applied both to cross-section and time-series data.

Final consumption
Goods and services used by households or the community to satisfy their individual or collective needs or wants.

Financing agents
Institutions or entities that channel the funds provided by financing sources and use those funds to pay for, or purchase, the activities inside the health accounts boundary.

Financing sources
Institutions or entities that provide the funds used in the system by financing agents.

Firm
A synonym for company or enterprise. (See also **Enterprise**.)

Fiscal year
The financial or accounting year of an organization, which may or may not coincide with the calendar year. An organization may find it convenient to end its accounting year at a time when inventory stocks are down. .

Global burden of disease (GBD)
The global burden of disease analyses use disability-adjusted life years (DALYs) to measure lost years of healthy life due to mortality and morbidity by cause, age, sex and region.

Grey market
Transactions that do not appear in official records of economic activity or that are hidden from tax authorities. In some cases, the entire exchange of goods or services lies in the grey market; in other cases only part of the exchange occurs off the record.

Gross domestic product (GDP)
The value of all goods and services provided in a country by residents and nonresidents without regard to their allocation among domestic and foreign claims.

Gross value
The value before deducting consumption of fixed capital.

Group insurance
Also called **social insurance.** Private insurance available to a group of subscribers related by some common characteristic, such as their employer or trade association. Group insurance is not available to unaffiliated individulas or families. (See also **Private insurance.**)

Health expenditure
The value of outlays for the final consumption of goods and services defined as health goods and services and for the production of certain activities defined as health activities.

Health insurance [3]
A contract between the insured and the insurer to the effect that in the event of specified events (determined in the insurance contract) occurring the insurer will pay compensation either to the insured person or to the health service provider. There are two major forms of health insurance. One is private health insurance, with premiums based on individual or group risks. The other is **social security**, whereby in principle society's risks are pooled, with contributions by individuals usually dependent on their capacity to pay.

Health insurance premium
An amount paid for a health insurance policy for a given period of time. In social security systems or social health insurance systems, one often speaks of health insurance 'contributions'; however, the latter does not normally reflect the individual risk of the contributor, as these systems usually engage in important risk pooling.

Health policy [7]
A formal statement or procedure within institutions (notably government) which defines priorities and the parameters for action in response to health needs, available resources and other political pressures.

Health promotion [7]
The process of enabling people to increase control over, and to improve their health.

Health research [8]
Research on all aspects of health, the factors affecting it, and ways of promoting, protecting and improving it. It includes medical and biomedical research relating to a wide variety of health matters and involving various life sciences such as molecular biology and biophysics; clinical research, which is based on the observation and treatment of patients or volunteers; epidemiological research, which is concerned with the frequency and distribution of diseases, surveillance, risk factors and other relatively proximate determinants of health; health systems research, covering health care policy, delivery and financing, equitable access and treatment, and non-health aspects; and socio-economic and behavioural research, which investigates the broader social, economic, environmental, psychological and cultural determinants of health and disease. An underlying principle of health research is to promote health and to prevent disease; often a multidisciplinary combination of the above kinds of research is needed to address, avoid or ameliorate a health problem.

Health status [9]
The state of health of an individual, group, or population measured against accepted standards.

Health system [10]
The system includes all actors, institutions and resources that undertake health actions — where a health action is one where the primary intent is to improve health. Although the defining goal of a health system is to improve population health, other intrinsic goals are to be responsive to the population they serve, determined by the way and the environment in which people are treated, and to ensure that the financial burden of paying for health is fairly distributed across households. Four key functions determine the way inputs are transformed into outcomes that people value — resource generation, financing, service provision and stewardship.

Household [2]
A household is a small group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food.

Household production of health care
Uncompensated health care produced within the household, e.g. family members caring for a sick individual. The uncompensated portion of this care is not counted as health expenditures in national health accounts.

Imputation
Making an informed guess about a missing value using logical edits or statistical procedures. (See also **Notional allowance.**)

Individual insurance
Also called **voluntary medical insurance,** private insurance is available to the general public (although

some applicants may be rejected for health reasons). Distinguished from group insurance, for which applicants must be employees of the sponsoring firm or members of the sponsoring organization. People may subscribe to a private insurance policy if they want to have a claim to additional benefits on top of what is already provided via social health insurance or a national health service system. (See also **Private insurance**).

Inflation [1]
An increase in the general level of prices in an economy that is sustained over a period of time.

International classification for health accounts (ICHA)
A comprehensive classification system for three important dimensions of national health accounts: financing agents, providers, and functions.

International classification of diseases (ICD) codes [11]
The international standard diagnostic classification coding system used for all general epidemiological and many health management purposes. The purpose of the ICD is to permit the systematic recording, analysis, interpretation and comparison of mortality and morbidity data collected in different countries or areas and at different times.

Interpolation [4]
Inserting missing data into a series. This is normally done by assuming that the data grew according to some known rule over the period when data are missing.

Labour
The physical and mental contribution to productive activity made by the work force.

Local government
Institutional units whose fiscal, legislative and executive authority extends over the smallest geographical areas recognized for administrative and political purposes.

Long-term care
Ongoing health and nursing care given to inpatients who need assistance on a continuing basis because of chronic impairments and a reduced degree of independence and activities of daily living. Inpatient long-term care is provided in institutions or community facilities.

Market production [12]
Also called market output. Market output is output that is sold at prices that are economically significant or otherwise disposed of on the market, or intended for sale or disposal on the market. Prices are said to be economically significant when they have a significant influence on the amounts the producers are willing to supply and on the amounts purchasers wish to buy. (See also **Non-market production.**)

Materials and supplies
Goods that their owners intend to use as intermediate inputs in their own production processes, not to resell.

National income
The total money income received by households in return for supplying factor inputs to business over a period of time.

Non-compulsory contributions
All contributions made that are not made obligatory by government.

Nongovernmental organizations (NGOs)
As used in health accounting, another term for non-profit institutions serving households.

Non-market production [12]

Also called non-market output. This consists of goods and individual or collective services poduced by non-profit institutions serving households (NPISHs) or government that are supplied free, or at prices that are not economically significant, to other institutional units or the community as a whole. A price is said to be not economically significant when it has little or no influence on how much the producer is prepared to supply and is expected to have only a marginal influence on the quantities demanded. It is thus a price that is not quantitatively significant from the point of view of either supply or demand. Such prices are likely to be charged in order to raise some revenue or achieve some reduction in the excess demand that may occur when services are provided completely free, but they are not intended to eliminate such excess demand. Once a decision has been taken on administrative, social or political grounds about the total amount of a particular non-market good or service to be supplied, its price is deliberately fixed well below the equilibrium price that would clear the market. The difference between a price that is not economically significant and a zero price is, therefore,a matter of degree. The price merely deters those units whose demands are the least pressing without greatly reducing the total level of demand. (See also **Market production.**)

Non-profit institution serving households (NPISH)

A non-profit institution is defined as a legal or social entity created for the purpose of producing goods and services, whose status does not permit it to be a source of income, profit or other financial gains for the units that establish, control or finance it. In practice, the productive activities of a non-profit institution are bound to generate either surpluses or deficits, but any surpluses it happens to make cannot be appropriated by other institutional units. Non-profit institutions serving households are separate legal entities.They are classified as private other non-market producers. Their principal resources, apart from those derived from occasional sales, are derived from voluntary contributions in cash or in kind from households in their capacity as consumers, from payments made by general governments and from property income.

Non-sampling error [2]

Non-sampling error is the error attributable to all sources other than sampling error. Non-sampling errors arise during the planning, conducting, data processing and final estimation stages of all types of survey.

Notional allowance

An **imputation** made with little or no supporting evidence. Notional allowances are needed in health accounts when there is no data that can be used to estimate the value of a particular group of transactions, yet it is acknowledged that such transactions exist.

Not specified by kind (nsk)

A category used to reflect those activities or transactions that fall within the boundaries of the health accounts (or other economic systems) but which cannot be definitively allocated to a specific category because of insufficient documentation.

Out-of-pocket spending

The direct outlays of households, including gratuities and payments in-kind, made to health practitioners and suppliers of pharmaceuticals, therapeutic appliances, and other goods and services whose primary intent is to contribute to the restoration or to the enhancement of the health status of individuals or population groups. Includes household payments to public services, non-profit institutions or nongovernmental organizations. Excludes payments made by enterprises which deliver medical and paramedical benefits, mandated by law or not, to their employees.

Parastatal enterprise

A state-owned company or enterprise. Common state enterprises include water, electricity, telephone services, oil and mineral extraction utilities.

Payroll taxes
Taxes payable by enterprises assessed either as a proportion of the wages and salaries paid or as a fixed amount per person employed.

Pharmaceutical product [13]
Any substance or combination of substances which has a therapeutic, prophylactic or diagnostic use, or is intended to modify physiological functions, and is presented in a dosage form suitable for administration to humans. In the *Guide,* pharmaceutical product is sometimes referred to as pharmaceuticals.

Pilot test
A small-scale survey that is the same as the main survey in every detail except for sample size and is carried out beforehand in order to test the survey and to anticipate problems in the main survey.

Price index [1]
A weighted average of prices of all goods and services produced in an economy measured over time. Typically, the index is structured so that it equals 1 in the **base period.**

Private insurance
Social protection schemes that are not controlled by government in its role of public authority. The following types of schemes are usually private:
Schemes run by non-profit institutions (mutual benefit societies, friendly societies, institutions co-administered by the social partners and so on);
Schemes administered by commercial insurance companies;
Non-autonomous schemes run by employers maintaining separate reserves in their balance sheets to cover their liability to pay benefits in the future (book reserves). Included here are funded schemes which government may have set up in its role of employer;
Non-autonomous schemes run by employers without maintaining segregated funds, including unfunded schemes which government may have set up in its role of employer.
In the national accounts, the first three types of schemes are referred to as private funded schemes; the latter are called unfunded employers' schemes. The last two types taken together make up the category non-autonomous employers' schemes.

Private sector
The part of the economy concerned with transactions of private individuals, businesses, and institutions.

Providers
Entities that receive money in exchange for or in anticipation of producing the activities inside the health accounts boundary.

Purchasing power parities (PPPs) [5]
A doctrine which asserts that a unit of currency should be able to buy the same bundle of goods in all countries. The validity of this proposition depends on several restrictive assumptions: the most important are that all goods are homogeneous and traded, there are no transactions costs or capital flows or impediments to trade and that there if full employment and price flexibility.

Quintiles
Values that divide a sample of data into five groups containing (as far as possible) equal numbers of observations.

Raw data
Figures and information that have not yet been processed to meet the definitions and requirements of the health accounts.

Recall bias
Error occurring in responses because the respondent remembers something differently closer to the present time than further in the past e.g., a person asked about the number of visits to the doctor in the past months may give a close to accurate report. If asked the same questions for the previous year, they may systematically under-report the number of visits.

Reimbursements
Repayments (partial or complete) by social security funds, private insurance schemes, or employers of approved expenditures made by households on specified goods or services.

Reliability
In research, the term reliability means repeatability or consistency. A measure is considered reliable if it would give the same result over and over again (assuming that what is being measured is not changing).

Representativeness [2]
The measured value of an indicator, based on an appropriately selected sample, must be close to that which would be obtained by measuring it for the entire population. This quality is a factor in the indicator's relevance, insofar as the definition of the observed population properly represents the total population.

Research and development (R&D) [9]
Any creative systematic activity undertaken in order to increase the stock of knowledge, including knowledge of human beings, culture and society, and the use of this knowledge to devise new applications. Includes fundamental research, applied research in such fields as agriculture, health, operational research, industrial chemistry, etc. and experimental development work leading to new devices, products or processes.

Resource costs
The factors or inputs used by providers or financing agents to produce the goods and services consumed or the activities conducted in the system.

Resources
The basic inputs to production — the time and abilities of individuals, natural resources such as land and capital (facilities, equipment, etc).

Rest of the world
All non-resident institutional units that enter into transactions with resident units, or have other economic links with resident units. Includes **External resources.**

Risk pooling
Spreading of losses incurred by a few over a larger group, so that losses by group members' are limited to the average loss, rather than the potentially larger actual losses.

Sample frame bias
Refers to a systematic difference between the sample frame and the population of interest. For example, if one is interested in all pregnancies and the sampling frame consists of all attended pregnancies, in certain settings, it may be systematically biased towards urban women as rural women may be less likely to have attended births.

Sampling error [2]
Sampling errors arise from the fact that not all units of the targeted population are enumerated, but only a sample of them. Therefore, the information collected on the units in the sample may not perfectly reflect the information which could have been collected on the whole population. The difference is the sampling error.

Sampling frame [2]
A sampling frame is a body of information about the population being investigated which is used as the basis for selecting samples and in subsequent estimation procedures.

Sampling unit [2]
A sampling unit is one of the units into which an aggregate is divided for the purpose of sampling, each unit being regarded as individual and indivisible when the selection is made. Such units may be defined on some natural basis, such as a household or a person, or on some arbitrary basis, such as areas defined by co-ordinates on a map.

Satellite accounts
In the system of national accounts (SNA), a framework linked to the central accounts which enables attention to be focused on a certain field or aspect of economic and social life in the context of national accounts, e.g. environment, tourism.

Selection bias [2]
A systematic error or bias that causes a sample to be unrepresentative of the population from which it came.

Social insurance
Generally used to refer to broad population-based programmes to provide economic protection against adverse events such as sickness, disabiity, or loss of income. In health accounting, social insurance is synonymous with **Group insurance.**

Social security [12]
Social security funds as defined by the SNA 93, constitute special kinds of institutional units which may be found at any level of government — central, state or local. Social security schemes are social insurance schemes covering the community as a whole or large sections of the community that are imposed and controlled by government units. They generally involve compulsory contributions by employees or employers or both, and the terms on which benefits are paid to recipients are determined by government units. The schemes cover a wide variety of programmes, providing benefits in cash or in kind for old age, invalidity or death, survivors, sickness and maternity, work injury, unemployment, family allowance, health care, etc. There is usually no direct link between the amount of the contribution paid by an individual and the risk to which that individual is exposed. Social security schemes have to be distinguished from pension schemes or other social insurance schemes which are determined by mutual agreement between individual employers and their employees, the benefits being linked to contributions.

Socioeconomic status
A social attribute that reflects an individual's place in the social hierarchy. Measures of socioeconomic status can include income, assets, occupation, education, race, and so on.

Standard error [5]
A measure of the degree to which a calculated statistic is dispersed around its mean value.

State-owned enterprises
Companies fully owned and run by the government. These are treated as private sector entities, so that their direct health expenditures are also found under the private sector. (See also **Parastatal entities.**)

Statistical significance
The difference between two figures is statistically significant if it is greater than one might expect from the sampling errors surrounding each of the figures. Conversely, the difference is not statistically significant if the difference between the two figures can be explained by that sampling error.

Survey [2]
A survey is an investigation about the characteristics of a given population by means of collecting data from a sample of that population and estimating their characteristics through the systematic use of statistical methodology.

System of national accounts (SNA)
The system of national accounts (SNA) is a broad structure for national economic accounting, developed jointly by the Commission of the European Communities, the International Monetary Fund, the Organisation for Economic Co-operation and Development, the United Nations, and the World Bank. The rules and structure of the SNA are contained in a manual called *System of national accounts* 1993, typically abbreviated SNA93. The foreword to the SNA93 describes it as "a comprehensive, consistent, and flexible set of macroeconomic accounts intended to meet the needs of government and private-sector analysts, policy makers, and decision takers". It provides the definitions that underlie such concepts as gross domestic product (GDP).

T-account
A tool which records, for a given aspect of economic life, (a) the uses and resources, or (b) the changes in assets and the changes in liabilities, or (c) the stock of assets and liabilities existing at a certain time. The transactions accounts (T-accounts) include a balancing item which is used to equate the two sides of the accounts (e.g. resources and uses) and which is a meaningful measure of economic performance in itself.

Third-party payers
Any organization, public or private, that pays or insures health or medical expenses on behalf of beneficiaries or recipients. An individual pays a premium for such coverage in all private and in some public programmes; the payer organization then pays bills on the individual's behalf. Such payments are called third-party payments and are distinguished by the separation between the individual receiving the service (the first party), the individual or institution providing it (the second party), and the organization paying for it (third party).

Top-down
An estimation method in which figures are estimated for the most aggregate level and then distributed to less aggregate levels. (See also **Bottom-up.**)

Traditional medicine practitioners and faith healers [14]
Traditional medicine practitioners and faith healers advise on methods to preserve or improve health and treat human mental and physical illness by techniques traditionally used in the community and believed to cure through assisting and stimulating nature, or by power of faith and spiritual advice.

Transaction
Loosely, an exchange of things of value between parties. For example, money may be exchanged for goods or services, or one set of goods and services bartered for another set.

Transfer
A transaction in which one institutional unit provides a good, service or asset to another unit without receiving from the latter any good, service or asset in return as counterpart.

Transparency
Openness. Activities are transparent if the actors, decisions, and consequences of the activities are easily discerned by a person outside the process.

Triangulation
The process of checking a figure by comparing it to estimates formed using other data or other sources.

Validation
The process of assessing a result by methods other than the ones used originally to obtain the result.

Validity [15]
A quality criterion for measuring instruments and describes the capacity of an instrument to measure what it should measure, accurately.

Value added — net
The value of output less the values of both intermediate consumption and consumption of fixed capital.

Value added — gross
The value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector.

Voluntary medical insurance
See **Individual insurance.**

Weighted average
Form of an algebraic mean in which each quantity is given a weight or importance in the final value.

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National health accounts are a powerful and practical tool for policy-makers interested in evaluating and restructuring their nation's health care financing and in developing and assessing financial interventions to improve people's health. This *Guide to producing national health accounts, with special applications for low-income and middle-income countries* provides practical help in developing this socioeconomic information. Jointly sponsored by the World Health Organization, the World Bank, and the United States Agency for International Development, the *Guide* pulls together the experience and expertise of long-time practitioners in the field to help the reader lay out the framework for a set of accounts. It walks the reader through the process of acquiring and evaluating data and provides step-by-step examples of how to turn raw numbers into information useful for policy analysis and development. Be they first-time health accountants looking for guidance or experienced practitioners looking for a good reference manual, readers will find the *Guide* to be a welcome addition to their toolkit.

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