Revision of the System of Health Accounts

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KEY CONCEPTS AND DEFINITIONS IN HEALTH ACCOUNTS INPUT PAPER UNIT 3

Summary
The objective of the paper is to analyze the challenge of measuring health expenditure and the volume of output of health services within the context of low and middle-income countries. It reviews present methodological proposals, comparing them with practical reality on how health output is actually being estimated in less developed countries with different types of health production and statistical capacity, which should be taken into account if the SHA is intended to be a worldwide standard. The SHA as well as the SNA are conceptual frames of reference for obtaining an approximation of the economy or one of its branches, resulting on estimations and not precise measurements. The conceptual framework is as important as the statistical methodologies that are applied to develop it as different statistical methodologies can lead to very dissimilar results even when the same conceptual framework is applied. Finally, the paper presents a feasible three-stage proposal for the estimation of health output volume measurements in developing countries and offers other recommendations for its implementation.

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KEY CONCEPTS AND DEFINITIONS IN HEALTH ACCOUNTS

INPUT PAPER UNIT 3[1]

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[1] *This input paper has been commissioned by the World Health Organization. The views expressed in this paper are those of the author and do not necessarily represent those of the World Health Organization.*

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Contents

KEY CONCEPTS AND DEFINITIONS IN HEALTH ACCOUNTS

INPUT PAPER UNIT 3

Introduction

The objective of this current document is to create inputs for the world community of health accounts regarding the proposed Unit 3 of the New Manual *A System for Health Accounts (SHA)*, which is in the process of being prepared through the revision of the current version, SHA v.1. This paper presents the authors' views specially related to the middle and low income countries.

Said Unit 3 will cover themes such as: total and current health expenditure; expenditure on health-related functions; whether a distinction between 'social' and 'individual' financing arrangements should be retained; health volume output; market and non-market production of health; prices for health care services and goods and health specific PPPs.

Unit 3 will replace chapters V and VII of the SHA, which set out a series of recommendations and guidelines for "health care *expenditure* measurement" and "*price and volume* measurement".

The reasoning and the proposals in the Manual (the current as well as the new one that will come out as a result of the revision process that is currently under way) are aimed at creating a homogenous methodology for estimating health expenditure and financing, defining the boundaries of the sector within national productive activities. For this purpose, it assumes a set of conceptual definitions with the aim of enabling the construction of a useful information system for defining and evaluating health policies throughout their application, which will enable comparison of the sector's performance over time as well as at international level. In this respect a particular concern is the measurement, in real terms, of non-market services, taking into account that existing definitions and classifications display certain weaknesses.

On the other hand, the present SHA version as well as other literature reviewed for the preparation of this paper is aimed at countries with higher development levels, while this input paper focus its attention on the low and middle per capita income countries.

In this sense, the reasoning and proposals outlined here deal exclusively with the problems encountered by low and middle per capita income countries in order to estimate the health sector denominators and take into account the serious limitations that they encounter in comparison with more developed countries, as far as availability of resources and statistical information is concerned.

The following reflections and recommendations are geared according to the authors' experiences in the production and use of statistics – of national accounts as well as of health accounts, in some low and middle-income countries with underdeveloped statistical systems.

Difference between measurement and estimation

The United Nations System of National Accounts (SNA) is based on the principles and procedures of conventional company accounting, which it uses as the information basis to calculate the value added (product) of the economy and the *national income*.

The logical *convention* of the company accounting system requires that to take into account each and every one of the entries; the double-entry procedure, for its part, leads to some precise results that do not allow for inconsistencies in the financial accounts balances. However, when trying to quantify the main denominators at national level, serious difficulties are encountered in obtaining the required statistical information. This makes it almost impossible to reach the levels of precision demanded by company accounting systems.

In other words, financial statements from a set of companies can be translated into the SNA format, but it is not feasible to register each activity related to *production* and *expenditure* at national level. This implies the need to adopt a series of statistics procedures in order to be able to make the estimations.

These setbacks are more evident and serious when trying to measure the variation in time of the *product volume* and *prices* (i.e. the total or sectorial product of the economy). These difficulties can be explained, mainly, by:

- *The appearance of new goods and services between one period and another.*

- *Changes in quality, which cannot always be distinguished from price fluctuations.*

Both issues are important in health accounting, given that medical activity is characterized by rapid and successive changes in the quality of technology, as highlighted by the SHA.

In conclusion, when trying to measure the variation of *volume* and the *prices* – when calculating a country's national product or the product corresponding to the health sector – one needs to be conscious that it is an imperfect exercise, or an approximation of a value that only exists in theory. In other words, we are dealing with an exercise that can always be perfected; it is clear that we cannot actually say that this is a *measurement* but more precisely is an *estimation* of something that, due to its very nature and complexity, is not in itself *measurable*.

This is a reality that becomes more evident in developing countries, where statistical information systems do not have the same scope, reliability and opportunity as countries with a higher level of institutional development.

For experts in the field, the previous considerations are nothing new. What we wish to highlight is the convenience of having them at hand at the moment of making recommendations on *conceptualization* and on *statistical methodology for quantifying health aggregates*, which are in effect *estimations*. In order to perfect this one needs better and increased availability of statistical information, and not just the conceptual adjustments. It is also likely that any attempt to make calculations beyond what the circumstances allow could translate into less precise results as well as not comparable ones.

Consequently, this paper recommends a "pragmatic" approach, at least for the least developed countries, trying to define a simple conceptual framework, without bringing in avoidable complications, which among other things could lead to less precise results.

The previous reasoning leads us to make an important conclusion in the sense that the recommendations of Unit 3 do not necessarily apply to all the countries across the board, but that each one's potential needs to be taken into account, as far as the availability of resources and statistical information is concerned.

Comparability between the SHA and the SNA

In this same vein we highlight the fact that the SHA, with the intention of adjusting the concepts of the health sector aggregates, differs in some definitions of the SNA's practices. For example, for several less developed countries, some of the points in the SHA are difficult to handle statistically and do not have quantitative significance, such as the Manual highlights:

- *Occupational health.*

- *The care that family members provide for sick, disabled and elderly people within the home "…in the cases that correspond to payment of social transfers granted for this purpose."*

- *"Hidden health services production (to avoid paying income tax or other taxes) with the purpose of earning hidden income in addition to that obtained through the conventions of social security or public administration programs."*

Decisions of this kind should be left to each country on the importance of transactions for their analysis as well as the availability of data for the estimation, but with clear identification and location above or below the line, in order to allow for international comparisons.

This theme also reminds us that the quantification of health sector denominators is an imperfect exercise and the result of some "conventional" conceptualizations and methodologies, and that although some logical and practical bases that justify the conceptual differences put forward by the SHA in comparison to the SNA do exist, it still leads to a range of different opinions. And it cannot be otherwise, as it deals with conventional concepts that can justifiably be modified to adjust to the aims that are pursued in each case. However, it could be said that the discrepancies between the SHA and the SNA, from a pragmatic point of view, lead to more difficulties than is usually perceived, especially in lower income countries, which leads one to consider the option that the SHA, initially, adjusts itself to the SNA's conventions.

It is also worth mentioning that the SHA Revision Work Program that is currently under way proposes making the new SHA compatible with the SNA and that the relationship between them should be *clear and explicit*. I.e. that if any items are conceptually different, these should be clearly and explicitly separated so that it is feasible to include or eliminate them, as the case may be.

Based on the previous arguments and following a pragmatic strategy, it is proposed that the SHA should initially adjust to the SNA conceptual conventions and that Unit 3 should make specific proposals aimed at quantifying certain concepts that could be useful for analytical purposes or in policy formulation, as well as in comparisons of health sector results over time and at an international level. Guides on how to approach these statistical methodologies should be developed and could be applied as pilots in some countries.

For example, the SHA v.1 recommends that the export of health-related goods and services should not be taken into account as part of the total health expenditure. In this case it is proposed that a pragmatic criteria should be followed – at least in the case of low-income countries – in the sense that when these exports do not have quantitative significance, they should not be taken into account. Conversely, when the opposite is the case, special efforts must be made in order to quantify them.

It must be stressed that despite the fact that the sales of health goods and services to non-residents are not part of the domestic expenditure or domestic health consumption, it could be worth recommending that these estimations are made for countries that export health goods and services. i.e., even in countries that do not have a satellite health account, it is proposed that a special effort could be made to quantify exports on the supply side, in as much detail as possible.

This subject should be included in Unit 3 due to the strategic importance that would be justified for the following reasons:

- *It is assumed that these goods and services are intended for a consumer who demands certain minimum quality standards – for example, availability of certain services or avoiding waiting lists -- and that the sale prices could provide a useful reference for estimating the quality of other national providers.*

- *As the production of these services expands, there could be external effects on producers who sell on the domestic market, such as staff training, diffusion of efficient procedures in service provision and the effect and use of new technologies.*

- *As these activities increase in importance, they could succeed in becoming an efficient production for substituting imports.*

- *Lastly, for some low income countries the drugs imports are an important item in the balance of commerce.*

Comparability dilemma: the conceptual framework vs. the practical estimation methodologies applied by the countries

The way the SHA tackles the main aggregates in the health sector is conducted from a conceptual point of view, without taking into account the different *statistical methodologies* that are applied to estimate the denominators. In addition to this, the manual does not take into account the weaknesses of statistical systems in poor countries, as mentioned above. The same thing can be said of the OECD and Eurostat documents on measuring health volume output.

In practice, even when using a consistent conceptual framework – be it SHA or SNA -- if the statistical methodology for making the estimation differs, the results are going to be different and not comparable.

One way of illustrating this last assertion is to contrast the SHA's purposes for estimating the variations of the *prices* and the *volumes* of production of goods and services through the concept of *disease episode*. This implies the availability of an efficient statistical information system, methodologically speaking a far cry from the rudimentary indicators used by poor countries.

Neither can we lose sight of the deficiencies in the least developed countries when it comes to the information that is available to providers (market as well as non-market) in the quantity, price and costs of the goods and services they produce. There could be a large number of reasons for this: the providers might not have computerized accounting procedures or information systems, they may be reticent to provide information, they might not have up-to-date estimations of the production costs, or simply that their information may not be reliable. In the face of this difficulty, statistics offices or central banks that prepare national accounts use statistics that are supposedly more appropriate for the circumstances of each situation and each country. This is often done without adequate knowledge of the health system, by the organizations in charge of these statistics.

For example, in the Dominican Republic, t*he variation in membership of the Medical College (which is mandatory by law)* is used to estimate the variation in *constant* terms of the health sector product. As can be appreciated for one country and one period, and even when applying a consistent conceptual framework, whether SNA or SHA – in order to *estimate* the variation of the health sector product in constant

terms, one would obtain very different results if using, for example, the *disease episode* method or the variation in the membership of the Medical College.

The relevance of the availability of statistical information and of methodological *estimation* becomes evident when SHA *tables* are prepared to describe health system financing. The preparation of these *tables* is relatively easy to carry out in comparison with the *estimation* of *volumes* and *prices*, because there is usually a greater availability of reliable data about financial flows, among which we can list the following examples:

- *National (central, regional or local) government disbursements to public and private health service providers, as well as disbursements that are transferred to the bodies that manage these funds.*

- *Government disbursements to families, if there are specialized health subsidies.*

- *Income received by medical insurance companies and the payments they make for different purposes, which could be grouped together financially.*

- *Quotas paid by companies, people and governments to social security and insurance companies.*

- *Co-payments that are made by families in health centers, as well as direct payments for purchasing services.*

- *Foreign funding and donations to the health system, to the public sector as well as to non-governmental organizations.*

- *The information generated by income and expenditure surveys that tend to be conducted in all countries and that allow for estimating disbursements by families for the payment for goods and services linked to health.*

The availability and reliability of the information indicated above is one of the great virtues of the matrices that the SHA suggests are filled out. The classification of these results according to functions of interest for understanding the health system makes them an ideal tool for decision-making within the sector when it comes to resource allocation.

In order to improve data comparability it is suggested to study not only the conceptual differences between frameworks, but also even more importantly the estimation methodologies applied in practice by the countries. Then guidelines should be

developed in order to standardize the procedures to improve statistical methodologies.

Service quality heterogeneity and other statistical challenges

On the other hand, there are significant differences within underdeveloped countries when it comes to the degree of economic development and the health system. Of great importance for this theme is the relationship that exists between the level of economic development and the heterogeneity of health service quality. It has been observed that when countries have a greater level of economic and social development, the quality of their health services tends to be more *homogenous*.

For example, in the poorest countries one comes across situations where mothers give birth without any help from another person or with the help a "midwife" who does not have any professional training. Co-existing with these realities, a significant proportion of institutional births could be registered, in which the mother receives professional help during the ante and post-natal periods. But, also in these cases, there tends to be a huge variation in quality. These institutional services for mothers giving birth can range from *terrible* to *world-class quality* in the same country. This means that we are dealing with services that have the same purpose, but with an extreme *differentiation* in quality, which should not be overlooked in the construction of health accounts.

In conclusion for different levels of development, a diversity of ways of organizing the health system is observed, where a clear relationship between poverty and institutional weakness is observed, and as a consequence, in the production of statistical information. In this sense, it could be stated that in poor countries the analysis of evolution in time of health expenditure based on variation of *volumes* and *prices*, is much more difficult and less reliable, due to the *heterogeneity in the quality* of health services, added to which is the no less important problem of the availability and quality of the statistical information.

If the SHA sets out to provide guidelines and procedures for a better construction of health accounts that will be useful for all countries, it must be taken into account that health systems usually correspond to the degree of development in each country, and that consequently the information and potential for creating mechanisms to generate new and improved statistics also depend on the institutional strength of each of these.

Taking the above into consideration, the observations and recommendations that are outlined below are aimed at developing countries in general, and take into account the diversity in the underdeveloped world and the importance of methodology for estimating macro-economic aggregates.

The challenge to measure the "disease episode" in LDC: a three-stage proposal

The SHA emphatically recommends that *disease episode* should be used for the estimation of the variation of *volumes* and *prices* in the health sector. This is, in all aspects, a very sophisticated methodology for middle and low-income countries. In effect, this methodological vision implies that treatment for illness is a final product and that all the goods and services used in this treatment are inputs (days of hospital admission, consultations, application of diagnostic measures, curative therapies, etc.).

It is evident that the matter we are dealing with requires great precision in diagnosis in order to determine each case of disease, within the thousands that have been formally classified, as well as a statistical system that is capable of registering them. It is possible, even, that the application of this system would imply a different vision in the administration of health goods and services production, than usually exists in less developed countries.

Following on from all reasons outlined above, it is proposed that the SHA should recommend that all countries establish a system that is adjusted to their institutional circumstances and to their availability of resources. Specifically, a possible approach to this matter could be the adoption of three different levels of precision in the estimation of the variation of the volumes and prices of the production of health related goods and services[3]. This is just one suggestion among possible different approaches.

For this proposal three successive charts or stages are suggested as preparation for establishing the bases that will eventually allow for the installation of a working

[3] These proposals do not include the issue of capital formation in the health sector.

system on *disease episodes*. As mentioned earlier, each country would have to decide which of the charts it would be able to adopt, according to its current circumstances.

Countries that are most economically backwards must apply a simple system, similar to the one sometimes used in producing national accounts for the manufacturing sector and other productive sectors: conducting a survey that allows to estimate for the base year, the items of goods and services which could reasonably represent the variations of the volume and the prices of the sector, assuming that it is also possible to obtain the information about the quantities produced and the prices of said items on an annual basis.

In effect, it is proposed that the production of accounts in countries with the greatest difficulties should be done using a simple methodological framework based on the premise that most of the production of health-related goods and services – *preventive, curative and therapeutic* – are induced by medical opinion on the level of ambulatory medical consultations and hospital admission. Consequently, the estimation of the annual variation of the volume and the prices produced each year would be done, initially, on the basis of two indicators: ambulatory consultations and patient admission days.[4] Evidently this methodology assumes the existence of proof that there is a reasonable relationship between the quantity of ambulatory consultations and the number of days of admission with the production of other health sector goods and services. In fact, in agreement with the SHA, a similar methodology has been used in other countries.[5]

Obviously, for these ends one would have to make periodic *base year studies*, with the aim of estimating the annual value of the health system's production, following the procedures outlined below:

- Select providers whose production could reasonably represent the variation of volumes of production of the whole system and that, in addition, have annual information related to the number of ambulatory consultations and days of admission. [6]

[4] See page 98 of the Manual.

[5] See page 98 of the Manual.

[6] In contrast with the industrial sector, the main goods and services in the health sector, for their value and frequency, are highly concentrated. For example, radiography, tomography and electro-cardiograms constitute a high percentage of the total use and value of diagnostic mediums. Likewise, blood tests, urine tests, fecal matter and lipids, as well as evaluations of pancreatic and liver function, make up a high percentage of laboratory tests. Something similar exists in the case of medications by therapeutic group.

- Providers of health-related goods and services on a profit or non-profit making basis need to be grouped in a way that is compatible with the Manual instructions (See Table 4.1). Said goods and services, should in turn be grouped according to category: *laboratory analysis and other diagnostic mediums, therapeutic procedures, consultations and medications*.

- Whenever the information is available, it is important to make the distinction between health goods and services, as they behave differently. There are three reasons to separate medicaments from services: the first is that there might be some quantity data available from industrial research and producers reports; the second is that the change in goods' production might be different of that on services as, for example, people might self medicate more often in a determinate period. And finally, medicines volumes may react to specific price movements[7].

- The *estimation* of the *variation* of the *prices* and *volumes* of the *goods* and *services* produced by the system will be calculated according to the quantity of consultations and the days of admission in the establishments' representative of the whole system, considered according to the *base year* coefficients. This should take into account that the expenditures do not reflect the same amount of goods and services (or their quality) if they are produced by market or non-market providers.

- To complete the information about the annual variation of the *volumes* and the *prices*, information must be obtained about:

    - Disbursements for the general health administration and medical insurance companies, which could be deflated by the CPI, by the number of occupied staff, or by an index of prices of the sector, drawn up for this purpose; and

    - Disbursements for the public health and prevention services, trying, as far as possible, to detail the information about public campaigns like vaccination and vector control.

It is recommended to compare the application of this methodology with the results of the usual SHA financing tables in current values, deflated by the CPI or a specific index for the health sector.

Then, depending on the facilities for generating information and resource availability, in order to improve the *statistical methodology*, in a second *stage* it would be possible to conduct the *estimation* of the variation of *prices* and *volumes* through quantity, cost and prices of *goods* and *services* produced during the year.

[7] Moraes, Ricardo, personal consultation.

This second *stage* is justified by the fact that in order to estimating the health volume output through *disease episodes* it is necessary to estimate the prices and the costs of the goods and services produced with the aim of conducting the estimations of the *volumes* of the goods and services involved in each of the *disease episodes*. In other words, once the information about the costs and prices of *goods* and *services* is available, it will enable the installation of a system recommended by the *disease episodes*.

In a third stage a system of *disease episodes* would start to be installed, starting with those of greater cost or strategic importance due to their influence on mortality rates, due to the burden of disease, due to the potential for preventing them, due to the convenience of unifying care protocols, or due to any other criteria. For these ends one way of starting could be using the following criteria.

- Preventable diseases associated with poverty. E.g. dysentery.

- Chronic diseases that imply a high cost for the system. E.g. renal dysfunction treated with dialysis.

- Epidemic diseases that can be controlled through vector control and/or public education campaigns. E.g. malaria, dengue and AIDS.

The OECD manual on the volume of health and education output, proposes DRG and ICD desegregation. Although low income countries might have a low statistical capacity for this approach, these are good alternatives for some other countries which have inpatient treatment data classified according to these standards.

Conclusions and Recommendations

The main conclusions that derive from the reasoning set out in this document can be summarized as follows:

- The SHA as well as the SNA are conceptual frames of reference for obtaining an approximation of the economy or one of its sectors. In other words, the figures

that result from applying either of these amount to estimations and not measurements.

- The conceptual framework is as important as the statistical methodologies that are applied to develop it. These discussions usually center on definitions, limits and classifications, without having paid much attention to the latter. Different statistical methodologies can lead to very dissimilar results even when the same conceptual framework is applied.

- Health production systems as well as statistical systems are very different according to country and generally speaking both are related to the degree of each country's development. If it is required that the SHA should serve as a worldwide standard, these differences have to be taken into account.

- On the question of the conceptual framework, it is recommended that the SHA should be fully compatible with the SNA definitions and that the relationship between the two should be clear and explicit, with the aim of being able to include or eliminate items, depending on the interest of each country or exercise.

- As far as estimation methodologies are concerned, it is recommended that a general study should be carried out on the way the health production volume of developing countries' national accounts is calculated.

- In this same vein, and taking into account that developing countries have statistical limitations, the recommendation is that price and volume estimations should be applied to all countries at different scales of complexity, as has been summarized before, taking into account their institutional circumstances and their availability of resources. The preparation of guides on uniform statistical methodologies, adapted to each country's level of development and conducting pilot programs for their application is also recommended.