

2 A conceptual framework for national health and welfare services accounts

Introduction

While national health and welfare services accounts are constructed and reported in the context of the broader national accounts framework, they involve some manipulation and re-ordering of the national accounts data. It is important, therefore, that we appreciate the concepts underlying the national accounts; the way they gather and report data; and their deficiencies when it comes to reporting on expenditure in specific areas of concern, like health and welfare services. These allow us to understand why there has been a move towards the development of specific satellite accounts in some areas, like health, tourism and the environment.

Box 1: Satellite accounts definition¹

Satellite accounts or systems generally stress the need to expand the analytical capacity of national accounting for selected areas of social concern in a flexible manner, without overburdening or disrupting the central system.

Typically, satellite accounts or systems allow for:

- (a) the provision of additional information on particular social concerns of a functional or cross-sector nature;*
- (b) the use of complementary or alternative concepts, including the use of complementary and alternative classifications and accounting frameworks, when needed to introduce additional dimensions to the conceptual framework of national accounts;*
- (c) extending coverage of costs and benefits of human activities;*
- (d) further analysis of data by means of relevant indicators and aggregates; and*
- (e) linkage of physical data sources and analysis to the monetary accounting system.*

Satellite accounts allow us to restructure certain national accounts data and to make supplementary estimates to add to those national accounts data to make them more meaningful in analysing what is happening in a particular area of concern. Progress is being made internationally towards the implementation of national health satellite accounts, the first step towards this being the adoption of the OECD's internationally comparable System of Health Accounts.

¹ Inter-Secretariat Working Group 1993:498.

Australia's national accounts record economic activity in Australia over a financial year (that is, from 1 July to 30 June). The published accounts provide the most basic set of data on economic activity at the national level, although some data are provided at a state and territory level. Their objective is to show the value of production over the year and its composition.

The national accounts data are used by a wide range of people, including policy analysts, journalists, teachers and the general Australian public, as well as international organisations, to describe the structure of the national economy and to monitor its performance, along with that of its various sectors. The central calculation provided in the national accounts is the value of national economic output – the market value of all goods and services produced – and the components that make up that aggregate. Nevertheless, while these basic calculations are important, the uses of the national accounts go well beyond them.

Most uses of the national accounts are comparative by nature. For a country, comparisons are made of the size of economic output and its composition across time and across industries. Comparisons are also made with other countries. In order to achieve such comparisons, it is vital to standardise, as much as possible, with respect to:

- concepts used
- statistical definitions
- methods of data collection.

International standardisation of national accounts has been achieved to a considerable extent and any changes which could threaten this standardisation are understandably resisted.

Proposals are made from time to time to alter the national accounts, either with respect to their coverage, format or their conceptual basis. Such proposals often come from special-purpose users of the national accounts information or parts of it and they often make sense for the purposes of the particular users concerned.

Nevertheless, given the central comparative function of the national accounts, proposals to alter the main body of the accounts, however sensible, may expect to meet with opposition from the statistical authorities. Changes to the coverage or format of the main body of the national accounts might ordinarily be expected to compromise their value for comparisons across time, across industries and across countries.

Satellite accounts provide an alternative. They offer a means of achieving purpose-oriented revisions of the national accounts while still preserving the standardised features of the main accounts. They do this by adding side calculations and/or supplementary information to the accounts, which address particular issues of interest, while leaving the main body of the national accounts intact. The System of National Accounts (SNA) approach is receptive to the use of satellite accounts (see Box 1, page 9).

In setting out a conceptual framework for the construction of satellite accounts, which are of value for understanding health and welfare issues, this chapter will

focus on broader conceptual problems with national accounting practice, especially as it relates to health and welfare issues. The normal framework of the national accounts buries these issues within other calculations, omits coverage of some important aspects of health and welfare issues, and fails to value the output of the health and community services sectors appropriately. As with all other output of the general government and not-for-profit part of these sectors, their outputs relating to health and welfare issues are valued at cost. Satellite accounts is one method of addressing at least some of these deficiencies.

The national accounts

The current set of international conventions for compiling national accounts and the reasons for them are set out in a comprehensive 1993 publication called the *System of National Accounts 1993* (Inter-Secretariat Working Group 1993). Australia has implemented this system and the major elements of Australia's national accounting practices are discussed in detail in the ABS's own concepts, sources and methods publication (Australian Bureau of Statistics (ABS) 2000).

Gross domestic product (GDP)

Prior to 1994–95 the ABS compiled estimates of GDP for Australia using three different approaches. These were the:

- income approach (GDP-I)
- expenditure approach (GDP-E)
- production approach (GDP-P).

While each of these measures of GDP should deliver the same estimate, because they were each derived from different data sources they usually resulted in three different estimates of GDP for Australia. In order to obtain a single estimate, the ABS averaged the I, E and P estimates to produce its GDP-A estimate.

From 1994–95 estimates of Australia's GDP have been integrated with annual balanced supply and use tables to ensure that the same estimate of GDP is obtained from the three approaches. Furthermore, in chain volume terms, GDP is derived using the expenditure and production approaches (Australian Bureau of Statistics (ABS) 2000:119). This has resulted in the elimination of statistical discrepancies from annual estimates, in either current price or chain volume terms.

Production boundaries

The 'production boundary' refers to the definition of the activities that constitute 'production', or alternatively, those that result in the production of 'output'. Obviously, this is an important issue for the national accounts because it defines which activities are to be included within the accounts and which are not. It is an especially important issue for the treatment of health and welfare issues.

According to the SNA the boundary 'includes all production actually destined for the market, whether for sale or barter' (Inter-Secretariat Working Group 1993:4, para. 1.20). In addition, the boundary includes all goods produced and consumed within households and non-profit institutions serving households (NPISHs), as goods can be switched between market and non-market use even after they have been produced, (Inter-Secretariat Working Group 1993:5, para. 1.22).

This raises the question of the treatment of services which are not produced for the market. The SNA production boundary excludes most services produced and consumed within households or NPISHs. So far as health and welfare issues are concerned, this point is very important.

The explanation for the different treatment of goods and services reflects the assumption that whereas goods such as farm produce 'can be switched between market and non-market use even after they have been produced', services cannot be. The words 'even after they have been produced' are largely irrelevant here. They refer to the fact that the consumption of services must generally be simultaneous with their production. Separation of production and consumption requires storage and services can generally be 'stored' only in the form of some kind of good. But this is true of all services, whether produced for the market or not and applies equally to those services included within the SNA production boundary as to those lying outside it.

The words 'can be switched between market and non-market use' are also unclear. Many services produced and consumed within the household can indeed be switched to and from market use. An obvious and well-recognised example is the services of private houses. Houses, or rooms within them, can obviously be switched between market and non-market use. But so can cleaning services, cooking services, lawn mowing services, the care of children, the care of aged and sick people, and so forth. Indeed, it is not even apparent why the possibility of being switched to market use should be the defining criterion for whether an activity occurring within the household should count as 'production'.

Even when activities occurring within the household are not readily capable of being marketed, they may be close substitutes for activities that are marketed. A good example is the services of household durable goods such as washing machines. The SNA treatment assumes that the washing machine is fully consumed at the time of purchase. This treatment leads to a multitude of anomalies. If the washing machine breaks down some years after purchase and the owner then sends washing out to a commercial laundry, GDP will rise.² If the householder subsequently marries the person doing the washing and it is then undertaken within the new household, GDP will fall again.

The major exception to the SNA treatment of services arises in the case of housing services. In this case a value is determined for the housing services consumed by all households, whether these services are purchased through the market or not. Where

² Net domestic product might not rise if the breakdown of the washing machine was appropriately treated as a loss of the household's capital stock.

they are not – as in the case of owner-occupied housing – the value of the housing services is imputed, based upon market rates for comparable housing. In this case the household implicitly purchases housing services from itself. Within the production approach to the calculation of GDP a hypothetical industry ‘ownership of dwellings’ is created. This industry earns non-zero value-added because its purchases of the intermediate goods, which contribute to the provision of housing services, need not exactly match the revenue from its imputed sales of housing services to households.

Once this amendment is made, preservation of the equality of the three approaches to the calculation of GDP requires that both the income approach and the expenditure approach also be amended accordingly. Under the income approach the ‘ownership of dwellings’ industry may earn non-zero operating surplus and under the expenditure approach the ‘ownership of dwellings’ industry invests in housing capital and households consume housing services, whether they occur through the market or not. It should be reiterated that if they do not, as in the case of owner-occupied housing, the expenditures involved are imputed, hypothetical transactions, not actual monetary or barter transactions that could be physically observed.

This exception to the SNA treatment of services provided within the household has become a matter of international convention. The reason for this convention is simply the practical importance of the matter. Under changing economic circumstances the stock of private housing does indeed switch between market and non-market activity. If non-marketed housing were excluded from the production boundary, large shifts in GDP sometimes would occur due to these shifts, while the true underlying production (and consumption) of housing services may not have been changing at all. Its composition between the marketed and non-marketed categories would have been changing. This would have affected GDP, but only because these shifts traverse the SNA production boundary.

The fact that the services of consumer durables such as washing machines and sewing machines are not treated similarly reflects the view that they are not likely to shift abruptly between market and non-market use, or that any such shifts would be relatively unimportant for the resulting GDP calculations. If this assumption did not hold, then the case for imputing the value of these services provided within the household or NPISHs would be just as strong as is the case with owner-occupied housing. Attempting to do this in a manner analogous to the housing stock would lead to clumsiness. Treating household durables as capital goods, analogous to the housing stock, would require expanding the production boundary to encompass hypothetical industries such as ‘ownership of consumer durables’ whose output would be services. The central problem is that the SNA conceptual framework does not recognise the reality of production within the household.

The conclusion cannot be avoided that the SNA production boundary reflects a considerable degree of arbitrariness. The exception made for owner-occupied housing serves to dramatise this fact. There is a strong reluctance within the SNA approach to include within the production boundary non-monetary transactions involving services, but the reasons given for this view are unconvincing.

The inclusion of large non-monetary flows...in the accounts together with monetary flows can obscure what is happening on markets and reduce the analytical usefulness of the data. (Inter-Secretariat Working Group 1993:4)

It is unclear what this means. It seems to suggest that analysis of the market transactions, which the SNA emphasises, would be impeded by taking account of relevant non-market transactions. The reverse is surely the case. If we wished to analyse the market supply of rental housing, for example, the existence of a large stock of owner-occupied housing and analysis of the conditions under which some part of it might become available for rental housing would obviously be relevant. Ignoring such matters would detract from the understanding of the market for rental housing, not add to it.

The location of the production boundary in the System is a compromise, but a deliberate one that takes account of the needs of most users...In labour force statistics economically active persons are defined as those engaged in productive activities as defined in the SNA. If the production boundary were extended to include the production of personal and domestic services by members of households for their own final consumption, all persons engaged in such activities would become self-employed, making unemployment virtually impossible by definition. (Inter-Secretariat Working Group 1993:5)

Far from implying that the SNA production boundary is appropriate, as is its apparent intention, this argument instead demonstrates that the concept of 'employment' would also benefit from critical review, simultaneously with the SNA production boundary. Persons involuntarily engaged in 'production of personal and domestic services...for their own [or other household members'] final consumption'³ are clearly not unemployed in a strict sense. They are not idle and are producing things of obvious social value. To the extent that their engagement in these activities is involuntary, in that they would prefer market-oriented employment if only it were available, they are indeed underemployed. They are made to appear 'unemployed' only through the arbitrariness of the SNA production boundary.

The SNA document acknowledges that omission of household production of services means that its measure of production is not comprehensive:

In practice the System does not record all outputs, however, because domestic and personal services produced and consumed by members of the same household are omitted. Subject to this one major exception, GDP is intended to be a comprehensive measure of the total gross value added produced by all resident institutional units. (Inter-Secretariat Working Group 1993:13)

Finally, it should be noted that the SNA framework is receptive to modifications to the production boundary being implemented within satellite accounts. Referring to these accounts the SNA document says:

In other types of analysis, more emphasis is given to alternative concepts. For instance, the production boundary may be changed, generally by enlarging it. For example, the production of domestic services by members of the household

³ The bracketed phrase '[or other household members']' is the author's insertion.

for their own final consumption may be brought within the production boundary. (Inter-Secretariat Working Group 1993:51)

Sector classification

The SNA divides the resident institutional units that make up the total economy into five mutually exclusive sectors:

- non-financial corporations;
- financial corporations;
- general government;
- non-profit institutions serving households; and
- households.

The categories seem obvious, except for the implied treatment of non-profit institutions. This is an important feature of the SNA as it relates to health and welfare issues because of the large role played by non-profit institutions in delivering health and welfare services.

Most of the non-profit institutions (NPIs) existing within the economy are allocated to the four categories other than non-profit institutions serving households (NPISHs). For example, non-profit-making entities such as hospitals, schools and colleges which charge fees to cover their costs are included in the first category, non-financial corporations, on the grounds that they are 'engaged in market production'. Non-profit trade associations which are financed by subscriptions from profit-making corporations and whose role is to provide those profit-making entities with services such as market information or political representation are classified as either non-financial corporations or financial corporations, depending on the classification of the corporations they serve. Those NPIs controlled by governments or which are engaged in non-market production mainly financed by government are included in the general government sector. Finally, non-profit entities owned by households but which are not legally incorporated are included as part of the household sector (Table 1) (Inter-Secretariat Working Group 1993:87-90).

Table 1: Institutional units cross-classified by sector and type

Type of institutional unit	Sectors of the system				
	Non-financial corporations sector	Financial corporations sector	General government sector	Households sector	NPISHs sector
Corporations (including quasi-corporations) ^(a)	Non-financial corporations (including quasi-corporations)	Financial corporations (including quasi-corporations)	..	..	..
Government units (including social security funds)	..	..	Government units (including social security funds)	..	..
Households	..	..	..	Households	..
Non-profit institutions (NPIs)	Non-financial market NPIs	Financial market NPIs	Non-market NPIs controlled and mainly financed by government units	..	Non-market NPIs serving households ^(b) (NPISHs)

.. Not applicable.

(a) All quasi-corporations, whether owned by households, government units or non-resident institutional units, are grouped with corporations for purposes of sectoring.

(b) Except NPIs controlled and mainly financed by government units.

Source: Inter-Secretariat Working Group 1993.

The category NPISHs is essentially a residual one. It consists of those non-profit institutions which are involved in production of non-market goods for households alone (not financial or non-financial corporations and not government) and which are not controlled or financed primarily by government (Rudney & Anbheier 1996). It should not be expected that such a compromise-driven residual category is useful for analytical purposes but the SNA document does not adequately recognise the conceptual and practical awkwardness that its compromise entails. The division of sectors is justified in terms of the economic behaviour of the major sectoral entities: corporations, NPIs, governments and households.

Corporations, NPIs, government units and households are intrinsically different from each other. Their economic objectives, functions and behaviour are also different. (Inter-Secretariat Working Group 1993:89)

The document goes on to explain the differences between the economic motivation and behaviour of corporations, governments, households and non-profit institutions.

Thus, dividing the total economy into sectors enhances the usefulness of the accounts for purposes of economic analysis by grouping together institutional units with similar objectives and types of behaviour. (Inter-Secretariat Working Group 1993:90)

The logic of this argument is seemingly defeated by the manner in which NPIs are allocated, with the exception of NPISHs, to other sectors, whose economic behaviour is said to be different from that of the NPIs concerned. It also means that NPIs, which are directed to similar purposes, such as health and welfare, are split according to the seemingly arbitrary sectoral rules used within the SNA. There would seem to be a strong case for a satellite treatment of non-profit institutions which identifies them as a separate sector, including NPISHs, but also those NPIs currently scattered elsewhere within the SNA sectoral classification.

Purpose, industry and goods and services classifications

Purpose-oriented classifications typically relate to the expenditure approach to GDP measurement. These include:

- Classification of the Functions of Government
- Classification of Individual Consumption by Purpose
- Classification of the Purposes of Non-profit Institutions Serving Households
- Classification of Outlays of Producers by Purpose.

Industry-based classifications relate to the production approach. These include:

- Australia and New Zealand Standard Industrial Classification,
- International Standard Industrial Classification
- the establishment classification within the National Health Data Dictionary.

Goods and services classifications are a third category and include:

- Central Product Classification
- Australian and New Zealand Commodity Classification
- AIHW National Classification of Community Services.

Classification systems sometimes mix the purpose and industrial categories. An example is the ABS classification of the socioeconomic objective of research expenditures (Australian Bureau of Statistics (ABS) 1993) – an important matter for health and welfare issues. This is ostensibly a purpose-oriented classification but in it research expenditures are classified by industry. An arrangement of this kind would make sense within an industrial classification but not a purpose-oriented system. The discrepancy might reasonably be addressed in future revisions of this classification.

It is important to realise that the coverage of these classification systems does not necessarily coincide. An example is that pharmaceuticals are defined as a category on the expenditure side of the national accounts, where expenditure includes not only the purchase of the physical goods produced by the pharmaceutical manufacturing industry and imported pharmaceuticals, but also the services of the retail pharmacy industry. Thus if the pharmaceutical manufacturing component of manufacturing (a production side category) is compared with expenditure on pharmaceuticals (an expenditure category), the former will be much smaller.

Another example relates to health insurance. This is a major component of health expenditures within purpose-oriented classifications. In industrial classifications, private health insurance is included within the insurance industry. The question that arises is – how should the profits or losses of the health insurance industry be treated? The premiums paid to private insurers for health insurance normally exceed the expenditures on health made by the insurance companies on behalf of their clients. The surpluses earned by the health insurance companies may be interpreted as the difference between the mean payment of customers to the health insurance industry and the expected value of actual health costs. From an economic standpoint it is debatable whether these surpluses should be considered an expenditure on health.

On the one hand, this difference may be seen simply as a payment for reduced risk, indistinguishable from any other insurance payment intended to reduce overall risk, such as legal liability insurance. The fact that it is tied to health insurance is merely a reflection of the riskiness attached to the health component of total expenditures. In this interpretation, the surpluses of the health insurance industry are simply payments for reduction of the risk attaching to one particular component of total expenditures, having nothing intrinsically to do with health at all. On the other hand, it may be argued that these payments are a part of the cost to the consumer of obtaining the health services desired. These expenditures – the premiums paid by consumers – have two components: the expected value of health-related costs, and a premium which reflects the cost to the consumer arising from the uncertain nature of these costs. The fact that consumers are willing to pay these premiums reveals that the combined value of the services derived is at least as much as the value of the premiums paid.

The issue is thus whether the cost of uncertainty reduction associated with health expenditures should be considered an expenditure on 'health', or some other kind.

In the SNA the surplus of premiums paid for health insurance over expected claims incurred is estimated and included as a service charge paid by householders for insurance. Thus, they are included in the national accounts as expenditure on 'insurance' (Australian Bureau of Statistics (ABS) 2000:201).

Nevertheless, the example of health insurance illustrates a potential problem with purpose-oriented satellite accounts. They may tend to 'draw in' expenditures from related areas. In such cases there will be a tendency to overstate expenditures on the area concerned.

Purpose-oriented classifications sometimes present forms of expenditure in a somewhat unhelpful manner. An example is the Classification of the Functions of Government system, which has hitherto separated the welfare categories of 'income support' and 'people with special needs'. The problem has been that these categories are not clearly distinct. 'People with special needs' include the very old and the very young, as well as people affected by disabilities. In April 1997 a new Classification of the Functions of Government was announced, which created a new category 'social protection'. Within this, the categories of 'transfers' and 'payments in kind' are distinguished. The new classification has some continuity with the old in that 'transfers' tend to coincide with 'income support' and 'payments in kind' tends to coincide with 'people with special needs'. Nevertheless, the correspondence is not exact.

As with other satellite systems, which relate to only a part of the total economy, a satellite relating to health and welfare services will generally not satisfy the accounting identities that relate to the economy as a whole. For example, the value of health and welfare services identified on the production side will ordinarily not sum to the value of these activities identified on the expenditure side. Identities, which apply to the whole system, do not necessarily apply to purpose-oriented satellite accounts.

Financing classifications

With the release of the 1999–00 government financial estimates the ABS moved from reporting government financial statistics (GFS) on a cash basis – largely following the previous SNA and the International Monetary Fund (IMF) standards – to an accrual accounting basis. The conceptual basis of the new reporting format complies with both changes resulting from the adoption of the SNA93 and the IMF's revised *Manual on Government Finance Statistics*, released in 2001.

Whereas there were significant differences between the old GFS and the SNA, the current GFS is based on a new conceptual framework that is derived from the SNA. The GFS and SNA93 use the same concepts and definitions to the greatest extent possible and, where different concepts have to be used, the relationships between the two are known so that it is possible to link one with the other.

The central feature of the GFS conceptual framework is that it is based on stocks and flows. Stocks are classified into assets and liabilities, while flows are classified into transaction flows, revaluations and other changes in the volume of assets.

Typically, transaction flows are those types of interactions that would usually be regarded as revenues and expenses in an operating statement of an enterprise (for example, revenue from sales of goods and services, salary and wage expenses, depreciation expenses and other expenses). Revaluations and other changes in the volume of assets are interactions that also have an effect on the value of stocks, but which do not involve transactions.

In an accrual system, such as the GFS, there is a relationship between stocks and flows, in that stocks, which are measured at a point in time, can only change through the cumulative effect of flows. Thus, the value of stocks on hand at the end of an accounting period is the sum of the value of stocks on hand at the beginning of the period and the flows that occurred during the period.

While the basic structure of the GFS and its major focus is on the nature of the flows that occur and their impact on stocks, effort is also taken by the ABS to allocate transactions on the basis of their purpose. The structure of the purpose classification used is identical to the government purpose classification (GPC) used under the previous cash-based reporting system (Table 2). The GPC itself is a derivative of the Classification of the Functions of Government.

In the case of expenditure on health and welfare, the relevant categories of the GPC are those classified as GPC25xx and GPC26xx.

Table 2: Government purpose classifications for Australia

Group	Description
25	Health
251	Acute care institutions
2511	Designated psychiatric units
2512	Nursing home type patients
2513	Other admitted patients
2514	Non-admitted patient services in acute care institutions
2519	Acute care institutions (temporary dump)
252	Mental health institutions
2520	Mental health institutions
253	Nursing homes for the aged
2530	Nursing homes for the aged
254	Community health services
2541	Community health services (excluding community mental health)
2542	Community mental health
2543	Patient transport
255	Public health services
2550	Public health services
256	Pharmaceuticals, medical aids and appliances
2560	Pharmaceuticals, medical aids and appliances
257	Health research
2571	Health research in acute care institutions
2579	Other health research
259	Health administration not elsewhere classified
2590	Health administration not elsewhere classified
26	Social security and welfare
261	Social security
262	Welfare services
2621	Family and child welfare services
2622	Welfare services for the aged
2623	Welfare services for people with a disability
2629	Welfare services not elsewhere classified

The problem of output valuation

In addition to the issue of the production boundary, a major problem arises within the boundary itself. For those goods or services which fall within the SNA production boundary but which are not supplied to the market, how are their outputs to be valued? This is a severe problem for the valuation of all government output and all output of non-profit organisations. It is especially important for the health and welfare sectors. The SNA approach is to value these outputs at cost. It is therefore impossible to use the SNA approach, so constructed, to analyse the productivity of the government or non-profit sectors. This would involve studying

the relationship between their outputs and their inputs. When their outputs are measured in terms of their inputs, productivity has no meaning.

This problem is conceptually distinct from the definition of the production boundary, discussed above, but the distinction is in some cases unimportant. As described, goods and services provided by government and non-profit organisations are included in the SNA production boundary, but are valued at cost. The problem is most severe when, as in the case of volunteers working in non-profit organisations, their services are provided with no explicit market cost. Their labour input is then valued at zero. Including them within the production boundary therefore achieves essentially nothing. This example is important in the health and welfare area because volunteers working in non-profit organisations contribute important services, for example to aged people and those with disabilities. In the national accounts their output is valued at its market cost, zero.

It is obvious that this treatment is a compromise, implemented for the pragmatic reason that attempting to measure the output of these non-marketed services is dauntingly difficult. But at a conceptual level it is clear what would be desirable. The output of the government and non-profit sectors should be valued on terms as consistent as possible with the way marketed goods and services are valued. In recent years there has been considerable progress in this area, including research in a new field known as 'contingent valuation'. The central idea of this literature is that in many circumstances either price or quantity is unobserved because of a missing market. In these situations, partially observed choices, combined with the restrictions imposed on the choice, may 'reveal the missing component of the trade-off inherent in every economically meaningful choice' (Smith 1996).

Examples of the application of this class of methods are the use of travel costs to infer the value of recreational facilities, 'hedonic prices' and household production models. Travel cost methods, and similar approaches, use observed quantities to estimate prices. Hedonic price methods use observed prices to estimate quantities and household production models use observed quantities (and possibly prices) of inputs and use this information to infer quantities (and possibly prices) of outputs. Parts of the contingent valuation literature draw upon a variety of research techniques drawn from experimental economics, market simulations and cognitive psychology.

In the case of volunteer services, their input could be valued at either:

- opportunity cost – the value of goods and services forgone as a result of their use in this form, or
- the value of the services freed up as a result of their work.

On purely practical grounds, the second seems more feasible because the opportunity cost may take the form of leisure without an explicit market valuation. It also has the conceptual advantage of measuring a benefit, rather than a cost, as in the first case.

This area of research is challenging, but it is realistic to expect genuine results from it. Internationally, there is great interest and some progress in developing genuine

output measures for government. Several European governments have made impressive progress. The Swedish statistical agency has for several years been placing valuations on all parts of Swedish government output, even including defence, which is notoriously difficult to evaluate. Accounting for qualitative changes remains a problem with this field of work. The Swedish work covers all segments of public sector activity, but concentrates on non-profit activities. Public utilities such as railroads and telecommunications were excluded because the national accounts already covered their outputs. In Australia the ABS has been actively developing and implementing output measures for government in recent years.

Tax expenditures

The Australian Treasury issues a Tax Expenditures Statement which classifies financial benefits derived by individuals and businesses from taxation concessions of various kinds. Health is one of the categories of such benefits, which it identifies. The concessions concerned generally relate to tax exemptions, tax deductions, tax rebates or reduced tax rates. They 'lower the tax burden by either reducing or delaying the collection of taxation revenue' (Department of the Treasury 1997:1).

The method of estimating the revenue forgone essentially assumes that if tax was payable at non-concessionary rates, the economic agents concerned would not change their behaviour. For example, a major category is fringe benefits tax exemption for benefits provided by public hospitals to employees (item H6). It is assumed, in calculating the value of the concession, that in its absence the magnitude of this component of the potential tax base would be the same as its (observed) size in the presence of the concession. The analytical problem, in calculating the true amount of revenue forgone in such cases, is to determine what would have happened in the hypothetical, unobserved situation where the concession was not available. The United States Treasury has used general equilibrium models in such circumstances to estimate the counterfactual values of these revenues forgone. The assumption that it would have been the same as its value in the presence of the concession almost certainly overstates its value.

Some of the items identified as 'health-related' in the Treasury document seem dubious. For example, item H2 'Exemption from Medicare levy for residents with taxable income below a threshold' does not seem to be a health-related expenditure, but rather one of general income support. Household expenditures on health-related matters are significantly affected by this item only in so far as it affects their total income because the price of medical services, as faced by households, is unaffected by it.⁴ Similarly, item H8, a negative concession, 'Penalty rate of excise levied on leaded petrol', is considered 'health-related', but taxes on tobacco products are not listed. In general, the classification 'health-related' misses the interrelations between health, social security and welfare.

⁴ In the terminology of microeconomic theory, this exemption induces income effects but not substitution effects.

GDP and welfare

Finally, our discussion of GDP and its measurement concludes with a brief summary of its relation to economic welfare.

Omission of non-marketed activities

Most services provided within households are excluded from the calculation of GDP. But this is an important omission because when these economic activities move into the market sector and back again, GDP changes. But this change in the measured value of national output has little or no welfare relevance. Bringing these household production activities into the calculation of GDP would seem to be the only systematic way to remedy this problem, but it will not be easy.

Depreciation of manufactured and natural capital

As noted above, GDP fails to account for the depreciation of either manufactured or natural capital. If a measure of sustainable welfare is desired, the degree to which current output is obtained at the expense of future output through depreciation of the capital stock should be considered. This leads to the more welfare-relevant concept of net domestic product (NDP). The application of this concept within the health and welfare area is clearly desirable.

Prices of marketed activities and policy-induced market distortions

In the calculation of GDP, those outputs that do enter the market system are valued at market prices. But market prices are distorted by tax and other policy interventions, which cause these prices faced by domestic producers and consumers to differ from their true social opportunity costs. A simple example is a tariff on imports of a pharmaceutical product. The domestic price of this imported commodity includes the tax, which must be paid at the border. But the tax is not a true social opportunity cost. It is merely a transfer from the purchaser of the good to the domestic government. The social cost of the good (its shadow price) is the landed import price (cif) excluding the tariff.

If domestic production of this same pharmaceutical product now occurs, how should that production be valued? The calculation of GDP uses its (tariff-inclusive) domestic market price. But the effect of producing another unit of this good is to displace one unit of imports, the social value of which is the cif price, excluding the tariff, not the domestic price. Consequently, GDP overvalues import-replacing domestic production, to an extent, which depends on the magnitude of the tariffs applying to their imported substitutes.

Prices of non-marketed activities

Obviously, when goods or services do not enter the market at all, the problem of valuation is more severe. In the case of the output of government and non-profit institutions, the solution is to evaluate them at cost. It is universally recognised that this is at best a rough proxy for the value of the output and that its use makes the

study of productivity within the government and NPI sectors virtually impossible. Progress is now being made to remedy this deficiency in the measurement of national income.

Prices of marketed activities and external non-marketed effects

Finally, it must be noted that when production for the market involves effects on other agents that do not operate through the market – externalities – the market signals that guide the producers and are used in the calculation of national income no longer measure the true value of the outputs produced. An example is production of a manufactured good, which produces health-affecting pollution. The true value of the output produced is its market value minus the social cost of the pollution produced. If these social costs were fully reflected in reduced marketed output elsewhere in the economic system, GDP would contain an indirect allowance for them. But in general, we expect GDP to understate the true social costs of such external effects.

In the health area, realistic market prices exist for pharmaceuticals, dental services, and other professional services such as physiotherapy and private hospital services. There is frequently the complication that the consumer is not buying the service directly but is first buying health insurance and then the insurer negotiates a price for the services supplied. However, there are still market prices available and these prices can be used to place a value on equivalent publicly provided services.

The above deficiencies in the concept and application of GDP are real, but we should not conclude from this that it lacks welfare relevance. Studies at the World Bank and elsewhere have shown that GDP is highly correlated, over time and across countries, with variables that have clear welfare relevance. These include measures of poverty incidence and health indicators such as life expectancy and infant mortality rates. While our discussion has focused on the areas of economic activity that GDP does not cover, the fact remains that what it does cover includes the bulk of what is relevant for economic welfare. The problems with GDP measurement should not be disregarded but GDP retains considerable welfare relevance in spite of them.

Satellite accounts

Satellite accounts are appendages to the main body of the national accounts. They are linked to the main accounts in that they receive information from them. In general, the flow of information is only one way (Figure 1). Calculations made within satellites generally do not feed back into the main body of the accounts. Satellite accounts may attempt to do any or all of three types of things:

- rearrange the main accounts information;
- extend the main accounts information; and/or
- revalue the main accounts information.

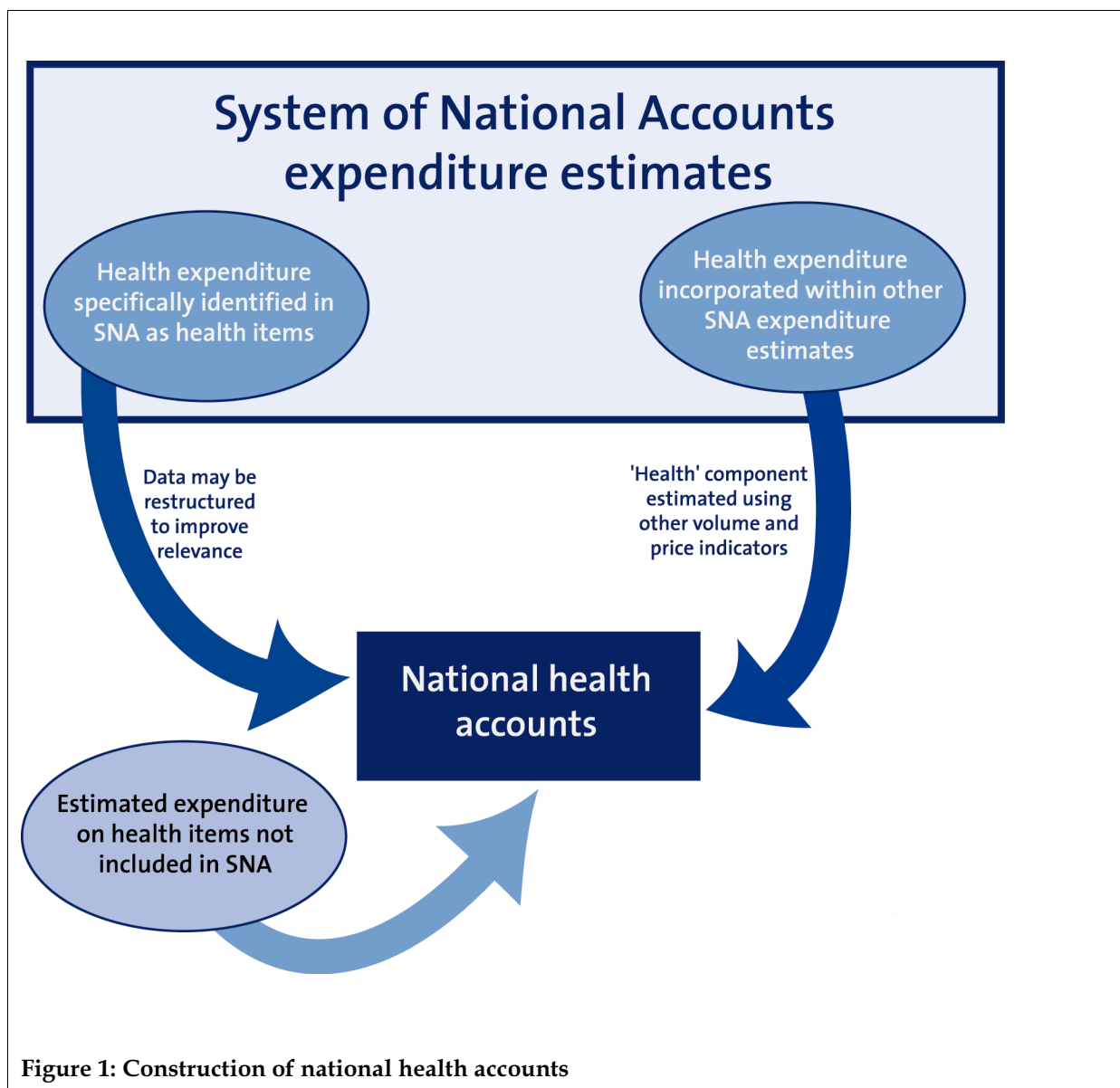


Figure 1: Construction of national health accounts

In this section we will discuss each of these functions of satellite accounts, illustrating each with an example outside the health and welfare area – land conservation. This illustration may be helpful to some readers used to thinking of health and welfare issues in particular ways by suggesting, through analogy, additional ways of viewing the relationship between health and welfare matters and the national accounts.

Rearrangement of main accounts information

This first type of satellite brings together information that is otherwise scattered within the accounts. Collecting and reprocessing this information makes special purpose analysis of data related to a particular set of issues feasible where it would otherwise not be. The essence of this type of work is that information is being disaggregated and reprocessed without altering the aggregates of the national accounts. The compilation and re-classification of health- and welfare-related

expenditures are examples of this role. Although it is related only to a particular component of GDP, it may be seen as a modification of the expenditure approach to the calculation of GDP.

Box 2: Land conservation analogy

Many groups are involved in devoting resources to land conservation and land reclamation. These include governments, local, state and federal, and quasi-governmental agencies such as the Murray–Darling Basin Commission. Voluntary organisations such as Landcare are also involved. Finally, farmers and other landowners also devote resources to attempts to prevent soil erosion and salination and to reclaim land that is already degraded. Classifying and comparing these expenditures is a rearrangement of expenditures already included in the expenditure approach to GDP measurement. But in the standard accounts it is quite impossible to isolate expenditures related specifically to this matter. Doing so is useful by making it possible to monitor who is spending resources in this area and how much. A satellite account would be used to present this information.

Extension of main accounts information

Within the national accounts, extensions of the SNA production boundary, calculations of productivity, and so forth, are not considered. They can be considered in satellite accounts. Extension of the SNA production boundary could be accomplished in a satellite by explicitly allowing for production of services within the household. Since doing this type of work on a comprehensive basis would be a vast undertaking it would clearly be best for special-purpose users of the accounts to focus on a particular set of household production activities – such as those involving health and welfare. Meaningful application of these concepts would of course require addressing the problem of valuation. This also applies to calculations of productivity. As noted above, when output is measured in terms of inputs, productivity has no meaning.

In the area of environmental economics, great interest has been generated by the idea of valuing the stock of natural capital. When the value of the stock changes during the production process, this can be allowed for in calculations of ‘green net domestic product’ which are analogous to present calculations of net domestic product in which allowance is made for the depreciation of physical capital during production. In the area of education, the value of human capital could be treated in an analogous manner. In the health area treating the stock of health of the population as an asset would seem to be analogous as well. ‘Health’ might be interpreted broadly at a conceptual level here, but initial applications of this idea would presumably need to limit its scope severely to make the task manageable. It would seem feasible to consider the presentation of data on health within an NDP perspective by taking account of the consumption of fixed physical capital. Valuing the stock of health capital is beyond reach at present.

The valuation of the change in the stock of an asset is different from the valuation of the flow of services from that asset that may have been enjoyed during the year. For example, suppose the value of the stock of ‘health’ in the population was the same at the end of the year as at the beginning. That is, there was no change in its value. That would not mean that the outputs of the health system had not delivered a flow of

health benefits during the year. This flow of benefits consists of the difference between the flow of health outcomes enjoyed during the year and what they would have been if the health system outputs had not been delivered. The value of outputs from the health system is thus the value of the improved health outcomes enjoyed during the year – to the extent that they can be attributed to the outputs of the health system – plus (or minus) the increase (reduction) in the value of the stock of health at the end of the year, to the extent that they can be attributed to the outputs of the health system.

Box 3: Land conservation analogy

The change in the economic value of the nation's stock of land is a useful measure.

Is agricultural output being maintained at the expense of 'mining' the land – depleting its productivity unsustainably? If so, what is the cost to the nation of doing this? One measure of this annual cost is what it would cost to restore the productivity of the land as it exists at the end of the year to the level of productivity it had at the beginning of the year. This cost would be a debit item in the calculation of 'green NDP'. Conversely, if the productivity of the land was raised during the year, as for example by land reclamation plus repair of previous degradation exceeding new land degradation, the increased net value of the asset would be a net positive item in green NDP. These calculations would take place in a satellite account.

The seminal contribution to this direction of economic thought was by Grossman (1972) and Muurinen (1982). The central concept is that health is a durable capital good, which is inherited from previous periods but depreciates over time. Investments in health are activities in which medical services and other inputs are used to offset in part the natural deterioration of the 'health' asset. Medical services (outputs) are demanded not for themselves but for their contributions to 'health' outcomes. Health is, therefore, treated in a way quite analogous to 'natural capital' in the earlier discussion.

Revaluation of main accounts information

The rules for evaluating outputs or inputs, as used within the main body of the accounts, may not be appropriate in general, or for the purposes of particular users. The valuation of government and non-profit organisation output, discussed above, is a good example. In principle, application of these developments towards valuing government output would be internal to the main body of the national accounts. That is, they need not be relegated to satellite accounts because they relate to the central issue to which the national accounts are addressed – the economic value of national output. However, because their initial use would be experimental they would presumably be located in satellite accounts until the methods involved became more standardised. They would operate primarily through the production approach to GDP measurement but would have counterpart implications for the income and expenditure approaches also, in order to preserve accounting identities. Adoption of the SNA does not exclude attempts to evaluate government outputs within the national accounts but favours output measures because outcomes depend on many things other than the output of the government. In the health area, general living standards contribute to health outcomes as well as the outputs of the health

system. Health examples of output measures used in the Swedish study include numbers of patients admitted, numbers of outpatient visits, numbers of bed days for in-patients, and so forth. It should be noted that these examples fail to measure activities such as research, health education and health promotion. Anomalies could arise from the mechanical application of these methods. For example, if a patient were to become infected with a new illness while in hospital and had to be involuntarily re-admitted after discharge, measured hospital output could increase even though health outcomes may have been worsened.

Box 4: Land conservation analogy

How should we value the conservation efforts of local, state and federal governments?

At present they are evaluated at cost. If we were to value the outputs of these agencies differently, we would need to ask what is the value of upgrading a kilometre of rural road to protect the road apron against erosion. Similarly, we would want to determine the value of a square kilometre of land protected by contour cultivation by farmers, presumably in terms of its contribution to reducing the cost of soil erosion.

Likewise, the value of contour rows of tree plantings established by a voluntary group such as Landcare would be valued, as it ideally should be in that it is a legitimate part of the nation's economic output.

In the Swedish work, the measures used generally relate to outputs, but in some cases outcomes are used as well. For example, the output of the police system is measured by reference to both 'patrol hours' and 'crimes solved'. The former is an output and the latter an outcome. Such cases are, in general, explicit compromises, justified largely by availability of data.

Some use of outcome measures is probably desirable. An example is the probability of surviving a heart attack as an output of emergency care. The principal role for the study of outcomes in the valuation process would be to provide an anchor for the valuation of outputs. In the absence of a useable market valuation, the principle, which should guide the valuation of outputs, is their marginal contribution to the achievement of desired health outcomes. The practical application of this principle is of course very difficult.