

14th Meeting of the Advisory Expert Group on National Accounts, 5-9 October 2020, Virtual Meeting

Agenda item: 6.7

Unpaid Household Service Work

Introduction

The valuation of unpaid household service work is necessary to better measure total economic growth and living standards. The only way to comprehensively account for economic growth is by extending the existing scope of the System of National Accounts to value the non-market activity performed within and between households without monetary compensation. Without an account of this activity, economic growth rates can be a misleading indicator of progress, blind to any transfers of activity from market production into the unpaid household domain, or simply change in the volume or value of the latter. The exclusion of unpaid household service work may directly impact welfare if economic policy biases intervention to favour the paid economy over unpaid household production. The draft guidance note attached to this cover note puts forward the following recommendations in relation to the above issues.

Definitions and concepts

Unpaid household services should include any activity which meets the third-party criterion (i.e. whether it could be contracted out to a market service provider). It is recommended that the following categories be used as a guide for identifying the types of productive activity, which would meet the criterion, for assigning a value:

- Unpaid childcare
- Adult care
- Nutrition
- Transport
- Household management services
- Laundry and clothing services
- Informal volunteering
- Shopping
- Information services
- Other unpaid household production not elsewhere classified

It is also recommended to further reflect upon the impact of digitalisation on the production of unpaid household services, as a follow-up to the proposals made by the Task Team on Digitalisation.

Methodology

Two alternative approaches to measure and value households unpaid service work are included in the guidance: the input approach and the output approach.

- *The Input Approach*

The input approach tries to monetise unpaid household service work by estimating the “sum of costs” of the various inputs needed to produce the relevant services: labour, capital services, and intermediate consumption¹. Time use data should be collected to produce valuations of the most important input category, i.e. unpaid labour. These should be produced on a regular basis, at least once every five years but ideally on a quarterly basis in line with the core accounts. Time use surveys should be harmonised and designed to collect as much activity meeting the third-party criterion as possible.

A replacement cost approach to valuation of hours worked should be followed using gross wage rates paid to employees involved in the production of equivalent market services. Specialist wage rates should be used but judgement should be applied to assess the suitability of some of these for certain categories of household production. For example, where average tradesperson salaries are used, it may be more appropriate to use an apprentice or general labourer’s wage rate to reflect the market premium paid to qualified tradespeople.

Imputed adjustments for taxes and subsidies and gross operating surplus should be made for comparability with the valuations of market production in the core national accounts.

Where time use data is not available and the input approach cannot be applied, the output approach should be used as an alternative.

- *The Output Approach:*

In the output approach, the basic mechanism for valuing unpaid household service work is to multiply quantities for each of the relevant household services with prices of similar services exchanged on the market. Consumption of services may be collected using administrative or survey data. The information may relate to consumption units such as:

- the amount of distance travelled while being transported by an unpaid driver/pilot;
- the amount of food consumed which required some unpaid food preparation;
- the number of hours of unpaid care likely to have been consumed by children (this can be a residual if total formal care hours can be estimated, with adjustment for assumed unsupervised time based on age of child);
- the number of hours of unpaid care that adults receive (as opposed to care hours provided).

Market equivalent prices for unpaid household services should be carefully scrutinised for their suitability with which to value particular types of unpaid household service work.

Furthermore, to arrive at an estimate of the value added generated by unpaid household service work, a reliable household expenditure survey should be used to estimate intermediate consumption of goods and services purchased from the market and used in the production of unpaid household service work.

¹ The latter category is often ignored, because the relevant inputs are very difficult to disentangle. Furthermore, its inclusion would only lead to a reshuffling of final consumption expenditure categories, with no impact on major macroeconomic aggregates.

More generally, it is recommended to confront the resulting numbers from the input approach with the valuations when using the output approach, to arrive at the highest possible quality estimates for the output and value added of unpaid household service work. Any substantial differences should preferably lead to additional research, and in the end result in a reconciliation of both approaches.

Extended SNA measures

Estimates of extended GDP, factoring in unpaid household service production, should be calculated to accompany traditional GDP measures. Divergence of growth rates may indicate activity shifting across the production boundary, while extended GDP may give a more accurate representation of economic growth better aligned to experienced economic welfare.

To mitigate distortions associated with monetary valuations, additional physical accounting may be added to supply and use tables. Some further research is needed to define whether industry breakdowns within existing supply and use tables are optimal for unpaid household service production and the estimation of extended GDP.

Future users of such extended accounts on unpaid household services will likely want to see results in volume terms as well. This is an area for which more detailed guidance still needs to be developed.

Optional parallel time-based accounting

Time accounting approaches may be set up to run in parallel to the wider SNA framework to provide a table which aligns as closely to the household perspective as possible. However, further research is also needed to identify the optimal applications of such tables, particularly from a welfare policy perspective.

Intended result of recommendations

The result of the proposals would be a set of extended accounts which incorporate the value of unpaid household work. These would not replace existing national accounts metrics such as gross domestic product, but would serve as a more comprehensive account of economic growth over time. Further, additional supplementary physical measures for the hours of unpaid household labour are also proposed to provide further insight into welfare factors such as work-life balance.

Documentation

- Draft guidance note “Recommendations for the effective measurement of unpaid household services within the 2008 System of National Accounts Framework”, as attached to this cover note.

Main issues to be discussed

The AEG is requested:

- To comment on the proposal to apply the third-party criterion for classification of unpaid household activities as productive, including the proposed breakdown into categories of unpaid work.
- To provide feedback on the feasibility, strengths and weaknesses of the methods set out in the guidance note.

- To express their views on the optional parallel full-time accounts or simplified physical accounting for unpaid household service labour.
- To comment on the recommended extended tables and whether they are happy with the approach, or if they see another preferable alternative.
- To provide feedback on ways to further improve the guidance note.

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**Recommendations for the effective measurement of unpaid household services within the 2008 System
of National Accounts Framework**

Introduction

As part of its work to advance the Research Agenda of the 2008 System of National Accounts (2008 SNA), the Inter-Secretariat Working Group on National Accounts (ISWGNA) established Subgroups to address issues of relevance to the update of the 2008 SNA for measuring economic and social developments such as digitalization, globalization, and well-being and sustainability.

The area group on unpaid household service work is one of the five groups established with a focus on Well-being and Sustainability. The other groups include environmental-economic accounting; distribution of household income, consumption, saving and wealth; education and human capital; and health and social conditions. In addition, another area group will look at a broader framework of national accounts, which brings together the results of the other groups.

The challenges involved in the measurement of unpaid household service work have been longstanding. For many years now, it has been debated whether its value should be included within estimates of economic growth. More recently, developments in digital technology have heightened interest in the area and raised a number of new questions about the role of unpaid household activities in the measured economy. To help resolve these debates and recent methodological problems, the issues under consideration include a subset of questions which will help to formalise recommendations on the route forward. The questions considered in this note include:

- Whether the production boundary should be extended for unpaid services and if so, should leisure time also be valued to better reflect the complete economic experience of households?
- Should additional value be added to Gross Domestic Product (GDP) to capture an Extended GDP including unpaid household service work and should this be recorded as part of the existing supply use tables within the “core” system of national accounts?
- Alternatively, should supplementary tables be used for recording unpaid household activities in physical and monetary terms?
- If unpaid production is measured using time alone (without a monetary valuation), should a full set of time accounts be produced to measure how paid work time, unpaid work time and leisure time are proportioned across the population?
- How should unpaid work be valued for and can productivity levels be measured within the valuation process?
- Is it possible to create monetary valuations of unpaid work in volume terms?

The 2008 SNA already raised a number of questions about how to define and value unpaid household service work, how best to treat consumer durables and what adjustments would be needed in the “core” accounts to put a value on formal volunteer labour (when conducted through or for organisations). Having noted these key issues as priority areas for discussion at the time, the 2008 standards stopped short of offering a preferred methodology for measuring or valuing unpaid work or how those measures should be situated within the wider framework of the system of national accounts.

Since the 2008 SNA was drafted much progress has been made to develop harmonized methods for measuring the value of unpaid household service work. This additional research now allows those initial questions posed in the 2008 SNA to be, at least partially, addressed. In addition to revisiting the original questions posed by the 2008 SNA, this guidance note will also go beyond that, and propose options for measurement in either (a) physical units of unpaid work (time spent producing or consuming unpaid household services), and (b) the valuation of unpaid household work within a wider accounting framework or separately in a parallel time account, to achieve a better measure of socio-economic progress than can be achieved using the GDP figure alone.

The SNA 2008 highlighted how the inclusion of the value of unpaid household services within estimates of the size of the total economy can help to avoid growth being overstated when non-market unpaid household service activity is replaced by market activity, for instance, with the increase in the employment rate for women over time. However, this only provides a part of the rationale as to why it is important to regularly measure the time or the value of unpaid household work within the system of national accounts.

In 2009, Stiglitz, Sen and Fitoussi led the Commission on the Measurement of Economic Performance and Social Progress (CMEPSP), who were tasked with looking beyond GDP as a measure of socioeconomic progress, as it was clear that growth in GDP had become far removed from a large proportion of society's perception of living standards. They recommended, amongst others, the inclusion of unpaid household services as additional income to households and adopting a more household oriented perspective in measures of socio-economic progress.

From a policy perspective, understanding shifts between market production and non-market production in producing household services is essential to understanding the division of labour, not just within households but also across government, business and household sectors. Further, questions were raised in relation to the impact of digitalisation, including the resulting shifts in and out of the market of certain services. In this respect, it was also concluded that it is currently not possible to clearly identify the impact of the digital economy within the existing statistics.

To some extent the latter issue of digitalisation is of most importance for the ISWGNA Subgroup for digitalisation, as it is the central tenet of their research objective. But that does not mean the lack of visibility of digital services (and their impact within the economy) does not affect production outside the current SNA production boundary. Quite the contrary, production of services by households has been affected by new capabilities offered to households by internet based digital platforms. Improvements in access to information, on-line shopping, entertainment are particularly obvious.

It is clear that people's well-being is affected by both paid and unpaid work. So, adopting an accounting approach closest to the household perspective requires the inclusion, in one way or another, of both. The following discussion elaborates on this point and highlights some of the mechanisms linking both paid and unpaid work to well-being.

The guidance note is split into 3 core parts. The first part will define unpaid household production and how it should best be measured within the SNA. Second, there is a proposal for extended accounts. And finally, the third part describes optional time based accounting methods which could be run in parallel to the wider SNA framework. Before the part 1 of the guidance however, the note will begin with a short synopsis of the current understanding of the link between well-being and paid and unpaid work to provide some context from the outset.

Well-being and paid and unpaid work

Before discussing how paid and unpaid work are linked to the well-being of whoever provides and benefits from them, it is necessary to define well-being, as different definitions exist and are used in literature. For the purposes of this guidance, a differentiation is made between:

Objective well-being — which covers several aspects of people's life, such as income, health, knowledge and skills, safety, environmental quality and social connections.

Subjective well-being — which measures self-reported well-being, i.e. evaluations, positive and negative, that people make of their lives and the affective reactions of people to their experiences. Subjective measures can be split into two dimensions – life evaluations and affect. Life evaluations include measures such as life satisfaction, and involve a cognitive judgement on the part of the respondent as to how their life is going overall. Life evaluations are sensitive to life circumstances, and change over time in response to life events, although there is a reasonably stable component to these measures (Diener, Lucas and Napa Scollon, 2006). Measures of affect, however, focus on people's feelings, moods, and emotions at a particular point in time. Positive affect comprises emotions such as happiness, contentment, and enjoyment. Negative affect includes fear, anger, sadness, and worry. Sometimes a third component (eudaimonia) is also identified, going beyond the respondent's reflective evaluation and emotional states to focus on functioning and the realisation of the person's potential (OECD, 2013).

As far as *objective measures of well-being* are considered, unpaid household service work is thought of as an input that, together with market goods and services, is transformed into household goods and services (i.e. caring, cooking, cleaning, maintenance) that are consumed by household members and benefit individual well-being. This process operates through intermediate stages involving intra-household production, cooperation and distribution activities. The relationship between input (raw goods and services and unpaid work) and well-being is not direct and immediate, and the family plays an important role within this process.

The passage from the initial stage (market goods and services) to the final stage of this process (individual well-being) creates added value in society, so that individual and social well-being is greater than the value of the available goods purchased on the market. While this guidance proposes a method in which unpaid household service work may be valued, it is also important to recognize that an analysis restricted to economic values is unlikely to completely capture all the contributions of unpaid work at the individual, household and social level. In particular, household activities not only affect significantly and contribute directly to the determination of personal capabilities and well-being outcomes, such as education and health, but they also enhance people's opportunities to participate in social life. For that reason, a parallel physical time accounting method is also proposed as a better 'catch all' solution to measuring the household experience.

The crucial role of unpaid household service work is particularly evident for the weaker members of the family – children, the elderly, the sick – for whom the absence of these activities in many cases would mean not achieving most of the fundamental functions. However, this is equally true for the 'stronger' members: the greater career opportunities for men, and therefore the different possibilities to achieve professional and personal goals, are often a consequence of an unequal distribution of domestic roles and activities within the family.

Most of unpaid work is done by women and girls. This is true in the developed world, where women's disproportionate share of unpaid work has a direct negative impact on their ability to participate in the paid economy leading to gender gaps in employment outcomes, wages and pensions (ILO, 2018). But the toll is even greater in developing countries, where the disproportional burden of household chores and care responsibilities restricts women and girls from undertaking education and skills training, accessing health care and participating in public life.

Paid work clearly contributes to the well-being of the worker and their family by providing the economic resources that allows them to satisfy basic needs and pursue many other goals that they deem important to their lives. However, the contribution of paid work to people's well-being is not limited to merely pecuniary aspects. For instance, if too little paid work can prevent people from earning enough income to attain desired standards of living, too much work can also have a negative impact on people's well-being if their health or their work-life balance suffer as a consequence. As people spend a majority of their daily life at work, and work for a significant part of their life, employment can provide not just a salary but also an opportunity for people to grow, to develop new skills and opportunities for self-realization, and to feel useful in society (Jahoda, 1982, 1992). Hence, it is not just a question of having a job, it is also a matter of job quality - a multi-dimensional concept that encompasses both monetary and non-pecuniary aspects of one's job (e.g. the nature of the work tasks assigned, the scheduling of working time, the prospects that the job provides). Several major initiatives (e.g. the ILO Decent Work framework, the UNECE framework for Measuring Quality of Employment and the OECD framework for Measuring the Quality of the Working Environment) have been taken at international level to establish guidelines for measuring different aspects of job quality that also have implications for people's well-being.

When considering the link of paid work and unpaid work to subjective well-being measurement, one can also refer to Kahneman et al. (2004), who used multidimensional experienced well-being data available in the American Time Use Survey to develop a unidimensional construct – the U-index² – to provide an overall assessment of the respondent's experience of different activities. Based on data from the 2013 well-being

² The first step in computing the U- index is to determine whether an episode is unpleasant or pleasant. An episode is classified as unpleasant if the most intense feeling reported for that episode is a negative one — that is, if the maximum rating on any of the negative affect dimensions is strictly greater than the maximum rating of the positive affect dimensions. Once the episode has been categorised as unpleasant or pleasant, the U-index is defined as the fraction of time spent in an unpleasant state of mind.

module of the American Time Use Survey, on average 14% of unpaid work is spent in an unpleasant state of mind (although some unpaid work activities, e.g. childcare, are more enjoyable than others), compared to 27% of the time spent on paid work.

PART 1 – DEFINING, MEASURING AND VALUING UNPAID HOUSEHOLD SERVICES

The first part of this guidance note recommends a methodology for accounting for the value of unpaid household service work, not only in physical units, but also in monetary values, both of them as consistent as possible with the current “core” system of national accounts, including its production boundary, and as relevant as possible to monitoring economic well-being of households. However, before these measures can be implemented, it is first necessary to discuss the production boundary, and what is considered to be out of the current production boundary but should also be viewed upon as a productive economic activity.

Concepts and definitions

Since the publication of the 2008 SNA, two sets of updated international guidance, which are of particular importance for the measurement of unpaid household service work, have been published. Firstly, the Guidance for the Valuation of Unpaid Household Work (UNECE, 2017), and secondly the Guidelines for Harmonizing Time-Use Surveys (UNECE, 2013). The first is of importance as it provides an important step toward a harmonised international platform setting out how unpaid household service work should be measured. The second is of importance as it sets out best practice for the production of time-use surveys, which are the primary data source for the production of accounts for unpaid household service work. In the following sections, this guidance note draws extensively on these new manuals and subsequent research to develop the concepts and definitions laid out in the current SNA. Further, it addresses the importance of digital services that contribute to household production.

Broadly speaking, unpaid household service work is defined as unpaid work performed within the household sector which could be contracted out to a market service provider under regular conditions. This latter condition is called the ‘third party criterion’, and was originally developed by Margaret Reid (1934). The definition excludes activities people can only perform on their own behalf, such as sleeping, other forms of personal care, and leisure.

Practical application of the third party criterion and typical categories of production

Types of unpaid household service work which are undertaken in different countries may differ considerably. Based on a review of different country practices carried out in the context of drafting the 2017 UNECE guidance for the valuation of unpaid household service work, activities which have been deemed to meet the third party definition are listed in Table 2 below. The table also builds on this guidance by recognizing the impact of digital platforms in the production and consumption of unpaid household service work.

Table 2. Categories of unpaid household service work

Area	Categories, descriptions and considerations
Childcare	Unpaid childcare captures the time provided by care givers in the direct care of children. This can range from helping with homework to feeding, washing or dressing children. Meal production is excluded and would fall under the nutrition category. Unpaid childcare can be considered in different sub-divisions – active vs passive or physical vs developmental. Active care is activity where the primary focus of the care giver is care. Alternatively, passive care is described as time where a person is in the duty of care of a caregiver but the care giver may not consider care their main focus. For example, a parent may not consider their current activity as childcare, particularly if they are busy with other tasks at the time or even sleeping overnight. However, if the parent was not physically present then they would need to find a volunteer to supervise the children or pay someone to do so. Passive care could also be referred to as time ‘on-call’ or potentially ‘supervisory care’.

	<p>For effective accounting of healthcare within the SNA³, unpaid care of children should include care for the sick and disabled, however, not all unpaid care for children is health related. The parallel ISWGNA paper: ‘Indicators of Health Care in the System of National Accounts’ highlights the importance that measures of unpaid childcare within the SNA should capture care of sick and disabled children for completeness. However, to achieve this, it is necessary to split out unpaid health or social care activities that are related to additional needs of children who were sick or disabled. As social care for children who were sick or disabled would be captured under other categories of unpaid work (such as nutrition or laundry) this would require the split ‘unpaid childcare for health or social care purposes’ to be made across multiple categories of unpaid work, including unpaid childcare.</p>
Adult care	<p>Unpaid adult care captures activities where individuals are providing informal healthcare services to an adult, for example changing bandages or dressings or other medical assistance. It can also include activity where an individual helps another adult by carrying out their cleaning, mowing their lawn or other voluntary tasks on their behalf. Unpaid adult care may be provided on a temporary basis, where an adult needs caring assistance for a fixed duration of time. Alternatively, it may also be provided to those who are potentially terminally ill and need long-term care. Unpaid adult care shares the same active vs passive care division as unpaid childcare and, in principle, adult care can also be split into physical and developmental categories. However, a larger proportion of adult care would normally be considered as physical care where most of those in receipt of adult care are elderly and require some kind of physical assistance.</p> <p>Unpaid adult care is also of relevance for complete healthcare accounting within the SNA⁴ and includes both health and social care activities. It is normally assumed that the majority of adult care is provided due to health related grounds.</p>
Nutrition	<p>Unpaid nutrition services include meal or drink production time, where it may be reasonable to expect that you could choose to order an alternative meal or drink from a market service.</p>
Transport	<p>Transport associated with any other activity (paid work, leisure, personal care or unpaid work) but where the producer of those services was not paid for that time. Transportation services can include transport provided to others free of charge such as giving another person a lift but can also include time where an individual transports themselves as opposed to paying for transport.</p>
Household management services	<p>This could include cleaning the household, sorting out the household administration or bills, DIY repairs of the household and gardening. This category also includes the management of some kinds of leisure task, for example where a household member has invested their time arranging holiday travel or accommodation, but only when the activity meets the third-party criterion. More and more frequently, household management services involve administrative tasks which are carried out online and hence this category has potential to see increases in productivity and may also displace some tasks previous undertaken by paid employees via the process of digital</p>

³ The measurement of unpaid care for health accounting is discussed in more detail in the final considerations section of this part 1 of the guidance note.

⁴ The measurement of unpaid care for health accounting is discussed in more detail in the final considerations section of this part 1 of the guidance note.

	intermediation (the replacement of face to face clerks and customer services with website based alternatives).
Laundry and clothing services	Unpaid laundry services involve the cleaning, ironing and drying of clothes, while the category can be extended to also include the unpaid repair of clothing. However, it is restricted to the repair of clothes alone as the unpaid production of clothes would be captured as a good produced for own use under the classifications laid out in figure 1.
Formal volunteering	Where households may engage in volunteering either through or for a charity of not for profit organisation it is classified as formal volunteering. The output of volunteers can be classed as a transfer from household to business sector but is often a household to household transfer of services only organised by a central organisation. Where formal volunteering directly relates to the output of the organisations being volunteered for, formal volunteering is recommended to be excluded from unpaid work valuations as this guidance does not include recommended methods to include its value in the wider SNA framework.
Informal volunteering	Where no organisation is involved, households providing voluntary services to other households are performing ‘informal’ volunteering. This activity may also be classified as adult care and that overlap of classification is discussed further in the section following this table. There may also be the case where services are performed for the environment or nature as opposed to for the benefit of other households and so it should be recognised that if informal volunteering is merged with adult care, that this may no longer provide a complete definition of informal volunteering.
Shopping	Although to some shopping may sound like a leisure activity, the vast majority of shopping time undertaken by households is related to regular grocery shopping. Where shopping for essentials is something which can easily be contracted out, it meets the third-party criterion. Part of the labour involved in shopping involves the transportation of goods from the shop to the household. Internet shopping means online delivery services are displacing some of the household labour involved in shopping. However, the act of shopping still occupies a significant amount of time overall. The productivity of time invested in shopping may be increasing more rapidly than some other forms of unpaid household service as a result of online shopping services.
Information services	With the expansion of the internet, there is now more scope than before for households to produce information for other households through digital platforms. These services do not have to be used by the consuming household to then produce another form of unpaid household production but could also be used as part of household leisure activities. The key criteria which defines whether the information produced is of value is whether the consumers of the information could have used a paid service for similar information. The production of content on platforms such as Wikipedia represent a pertinent example of such information, where in absence of Wikipedia it might be necessary to buy an encyclopaedia for similar information.
Other unpaid household production not elsewhere classified	It is feasible that the above list is not exhaustive and hence an ‘other’ category is recommended to ensure that a complete accounting of unpaid household service work.

Although the categories in Table 2 may seem mutually exclusive, as with most statistical definitions, there are cases where certain activities could be classified as multiple different categories of unpaid household work. For example, it could be that informal help to adults in other households could be classed as informal volunteering, or alternatively, it could be classed as adult care. Similarly, some forms of meal preparation may be captured as meal preparation, but equally they could be considered a form of informal care.

It is not the purpose of this guidance note to define these categories of unpaid household service work as fixed and internationally agreed upon. Rather, the categories above serve as an illustration of how unpaid household services can be categorized, and also what types of activity may fall within the boundary when applying the third party criterion.

However, when such categories are formalised, it should be recognised that there is a diverse user base for unpaid household service work statistics and hence the appropriate sub-divisions of types of unpaid household service should be suitably diverse to meet those needs. The area also overlaps with areas such as unpaid healthcare and unpaid education services and has been discussed in the relevant guidance notes written by the subgroup for well-being and sustainability.

Recommendations:

- 1) The categories of unpaid work in table 2 (excluding formal volunteering) are proposed for use when accounting for the value of unpaid household service work. However, further research is needed to formalise an agreed international standard.
- 2) Categories used to define total unpaid household production should be as complete as possible for the purposes of monitoring shifts of activity across the core production boundary.
- 3) It is also recommended to further reflect upon the impact of digitalisation on the production of unpaid household services, as a follow-up to the proposals made by the Task Team on Digitalisation.

The significance of the third party criterion is that it determines two separate forms of production: (i) unpaid household service production; and (ii) paid goods and services included within GDP. The unpaid services have not been included within the current production boundary of the SNA, and have only been accounted for in separate ‘household satellite accounts’. The value derived from owner-occupied housing is an exception to the definition set out by the third party criterion. These housing services have been brought into the ‘core’ production boundary for the purpose of international comparability, as the proportion of housing stock used for rental varies greatly between countries and can cause significant distortions in comparing economic output between one country and another. Conversely, all goods for own final consumption, even when produced outside the market, are included in the production boundary of the current SNA. The 2008 SNA excludes unpaid household service production for practical reasons, to stay relevant for certain economic policies and analysis, and to avoid difficulties in interpretation. However, it is considered increasingly feasible to account for unpaid household services both physically and monetarily in such a way that it can be consistently compared across countries using the wider framework of national accounts. Figure 1 provides an outline of the boundaries within SNA 2008.

Figure 1. SNA 2008 boundaries and forms of work

Intended user of production:	For own final use		For use by others					
	Services	Goods	Employment (work for pay or profit)	Unpaid trainee work	Other work activities	Volunteer work		
In market and non-market units						From households producing:		
Forms of work:						Goods	Services	
Treatment within the 2008 SNA:	Activities included in SNA production boundary						Activities outside of the SNA production boundary but within the wider SNA general production boundary	
Scope of economic definitions:	Gross Domestic Product (GDP)						Extended Gross Domestic Product (125-180% approx. size relative to GDP)	

Internationally, the types of unpaid household service work captured in the definition using the third party criterion range from housework and chores, to family care for either adults or children. To add some context

to the relative scale of unpaid household service production at an early stage of this guidance note, it can be emphasised that it is quite normal for a higher proportion of households within a country to engage in some form of unpaid household production, than would normally be the case for paid work. This is because whether retired, unemployed or in full-time education, individuals would normally undertake at least a range of unpaid household production tasks in a typical day.

The vast majority of activity captured as output within the 2008 SNA results from paid employment and so the strength of the economy is more likely to accurately reflect the contribution of the paid labour market. As shown in Figure 1, it first and foremost concerns services produced for own final use and volunteer work which are excluded from the current SNA production boundary. The figure however gives no indication of the typical scale of each area and only after analysis does the size of this production of unpaid services become apparent, typically representative of a value which is over 25% of the value of GDP.

Boundary between unpaid household production and leisure

Leisure clearly provides well-being to people. As Report by the Commission on the Measurement of Economic Performance and Social Progress, more commonly referred to as the Stiglitz-Sen-Fitoussi Report (Stiglitz, Sen and Fitoussi, 2009) also acknowledges: *“Consuming the same bundle of goods and services but working for 1500 hours a year instead of 2000 hours a year implies an increase in one’s standard of living”*. However, it should be noted that the distinction between time spent on unpaid household activities and time spent on leisure may not be that clear cut. Some will consider gardening as a drag, while others will view upon this activity as a way to spend leisure time. Similarly, *“many view cooking - and then eating – as a most enjoyable leisure activity, not a chore that is easily substitutable with a meal in a fast food restaurant”* (Stiglitz, Sen and Fitoussi, 2009). A similar line of reasoning could be applied to taking care of children. The potential problems with this distinction are simply ignored, thus following the perception and the allocation of time chosen by the households.

However, the same concern can be applied to paid work—many people derive satisfaction from it and continue to do it even when they are not paid. Since we cannot observe people’s satisfaction directly, and also because national accounts are primarily focused on income and consumption, not satisfaction, the third-party criterion works best to understand where the boundary with leisure should be.

Further to this, § 6.16 of the 2008 SNA states the following: *“The production of services must be confined to activities that are capable of being carried out by one unit for the benefit of another. Otherwise, service industries could not develop and there could be no markets for services. It is also possible for a unit to produce a service for its own consumption provided that the type of activity is such that it could have been carried out by another unit.”*

Although the distinction between unpaid household service work and leisure can be established by strict adherence to the third party criterion, the above statement from the 2008 SNA raises the issue of potentially further extending the concept of household income by adding a value to leisure time. If households are producing leisure services for themselves or other households then leisure time can also have a valuation. To do this consistently within the system of national accounts, one would need to further extend the production boundary as well, which is, for the reasons mentioned above, more problematic than in the case unpaid household activities. Alternatively, one could simply show a memorandum item, representing the value of leisure time, next to, but not integrated into, the value of household disposable income (and production). But also in this case, one needs to resolve various problems in relation to the exact delineation and the valuation of leisure time. In respect of the latter, the conceptual problems are significantly larger than in the case of unpaid household activities, mainly because there is no such thing as an equivalent service, and therefore also a more or less equivalent market price, for leisure time. Most probably, one would end up with applying a valuation according to the opportunity costs of not doing paid or unpaid work, thus implicitly valuing leisure time of high income earners more than leisure time of low income earners. When one realises that leisure time is about 20% of total time spent, as compared to 20% on paid employment and 15% on unpaid work, one can also imagine the sheer magnitude of broadening the income concept with leisure time. For a more detailed discussion, reference is made to section 4.9 of Stiglitz, Sen and Fitoussi (2009) and to Boarini et al. (2006).

Furthermore, part 4 of this note provides information on a possible way to value leisure time using information on experienced well-being available in a number of time-use surveys.

Measurement in physical and monetary units

For valuing unpaid household work two separate methods can broadly be distinguished: (i) the input method, where the valuation is based on the inputs needed to produce the services, i.e. unpaid labour input, intermediate goods and services, and consumption of fixed capital; and (ii) the output method, where the units of service produced and consumed are used as a starting point for the valuation. Both methods should ideally result in a valuation of output and value added for the unpaid household services which is equal. In practice however, valuations using the two methods will usually differ due to the strengths and weaknesses of the data sources for the two approaches.

In applying the input approach, the measures of hours worked need to be multiplied by a suitable market equivalent wage rate, to value the labour input component. To arrive at an estimate of the output, estimates for intermediate consumption and consumption of fixed capital need to be added. Alternatively, taking the output approach, once the units of a service produced and consumed have been counted, a shadow price for the relevant service must be applied to each unit of service⁵. To arrive at (net) value added, estimates of intermediate consumption and consumption of fixed capital need to be deducted.

It is important to recognize that the choice for either of these approaches comes with its own advantages and disadvantages, and should not be seen as a matter of taking one or the other just based on the ease to which data can be acquired to support that particular approach. For example, if one applies the output approach, then the positive attributes include the comparability to the prices of equivalent market services. However, the output approach does not allow much insight into the distribution of unpaid household service work production within households and hence the approach may lack coherence with the typical household experience. If a household member is becoming overburdened with unpaid household service work tasks, it may be of great concern to all household members and a time use survey may pick up this overburdening. However, as the output approach does not require time use data, this information may no longer be available.

Furthermore, applying the input method with a high quality time use survey offers the capability to capture all subtypes of unpaid household service work holistically without the need for a collection of multiple data sources. Additionally, it is better able to reflect the household experience if further analysis is undertaken to ascertain the distribution of unpaid work tasks within the household. Conversely though, it may be more expensive to acquire the data via a time use survey, and a time use survey may lack coverage of some kinds of passive or ‘on-call’ type activity, where respondents do not record their activity but are still acting in a particular capacity. For example, providing babysitting services, but only writing down the activities one is doing while babysitting – watching TV, eating a snack and so on. Non-response may also be a concern in truly capturing the total scale of unpaid household work in any given year, if those who are very busy do not respond to the survey.

Overall, it may be considered that the input approach to valuation (using a time use survey) better enables understanding the household experience, and hence facilitates a well-being orientated analysis to be conducted following valuation (e.g. the measurement of the distribution of paid work within households). Alternatively, an output approach may provide estimates which are more consistent with the valuations of economic activity within the ‘core’ SNA production boundary, and is therefore preferable (a) to measure transitions of activity across the production boundary (where market services take on what was previously produced by households and vice versa); and (b) where estimates of GDP are to be extended to create a time series of GDP estimates including unpaid household service work. The following sections describe the input and output methods in more detail, and also describe some of the challenges associated with each of them in more detail.

⁵ Here, the starting point is the valuation at ‘basic prices’, thus excluding taxes less subsidies on products.

Whatever the advantages and disadvantages of the various methodologies, use of both methods offers great potential for cross-checking and balancing of results, as elsewhere in the national accounts, even more so as both methods are relatively new, often hampered by lack of adequate data, and still evolving.

The input approach, challenges in measuring time and the compilation of wage based valuations

Table 3 presents the logic of trying to arrive at estimates for the output and value added. The table lists all possible cost elements from a conceptual point of view. In practice however, gross operating surplus may be estimated by using consumption of fixed capital for a number of consumer durables used for the production of unpaid household services, either or not supplemented with a return on capital. Furthermore, other taxes less subsidies on production will usually not constitute a major element in the costs, and therefore may be ignored altogether. To date, very few valuations from countries who have used the input approach include an imputation for gross operating surplus or imputed value of taxes and subsidies, but methodologically, it is necessary to achieve a valuation of output as close to those in the core national accounts or the output approach to valuing unpaid work.

Table 3. Components of the input approach and the necessary steps to device GVA estimates

Component	Description in the context of unpaid household work
Compensation of Employees	The market equivalent cost of the labour involved in the production of unpaid service household work
+ Gross Operating Surplus	The imputed value of profit based on market equivalent services
+ Other taxes less subsidies on production	The imputed value of taxes and subsidies based on market equivalent services
= Gross Value Added	The sum value of the above components and the value which is used in the Extended GDP valuation or the final aggregate value of unpaid household service work
+ Intermediate Consumption	The value of goods and services which are consumed in the production of unpaid household work
= Output (at sum of costs)	

The challenge of creating effective and harmonised measures of time worked within the input approach

As noted in the 2008 SNA, it is considered best practice to collect data from a time use survey to estimate the labour input component. All time use surveys collect some kind of record of respondents' main activities (i.e. what a respondent deems to be the primary activity they are focussing on at any given time), although often a record of secondary activities is also collected to account for multitasking and other background activities that a respondent may not consider their main activity.⁶

⁶ J.P. Robinson, in the authoritative Juster and Stafford (1985), and Kan and Pudney (2009) identified diary methods as the "gold standard" for time use data collection. Further, Niemi (1993) provided evidence of the upwards bias of interview-based working time statistics, also substantiated by Robinson and Bostrom (1994) and Walthery et al (2019). There are others, however, that argue a contrary position; see e.g. Jacobs (1998) who says the overestimated work-time claims from the questionnaire method

Effective design and specification of time-use data collection is crucial for accurate measurement of household production. Two major challenges associated with collecting time use data for the purpose of creating internationally comparable accounts of unpaid household service work can be distinguished. The first is cost: full own-words self-report diaries are without question relatively costly to implement. Only the very large and relatively homogenous population of the USA has in the past been sufficient to maintain a continuous programme of diary data collection (the ATUS). In other developed economies, national diary collections have as a result been intermittent (with 5 to 10 year intervals between them). The second challenge concerns the respondent burden: this may lead to high levels of non-response, and related response bias. However, new technologies for machine-assisted data collection (e.g. utilising smartphone features and facilities), together with lighter diary designs, may mitigate both problems. It is understandable that pragmatic concerns may push statistical offices towards the questionnaire-based approach to time use estimation. But these estimates should at least be regularly calibrated against the diary-based results, which provide unbiased estimates summing to 24 hours per respondent.

Where time use data has been collected, further issues of comparability and reliability have been evident, partly as a result of these challenges, but also because of a lack of legislation to mandate time use data collection and (until the last two decades) the lack of guidance to harmonise time use data collection. Indeed, the number of nationally representative time use surveys has actually increased substantially over the last decade, but differences in survey design and administration make cross-country comparisons difficult. While international variation offers some important lessons in survey design, it also discourages effective utilization of the available data. Without explicit efforts at international harmonisation, similar to those which have guided (the implementation of) international standards for the system of national accounts since their inception, economic estimates based on time use data may prove problematic.

Some inconsistencies are simply endemic to general survey administration, such as choice of sampling frames, training of survey staff, and monitoring of data quality. More pressing concerns relate to basic survey designs. Collection of time use data has a shorter and far less voluminous history than collection of data on production and consumption of marketed goods and services. Differences in survey wording and categorization are apparent even across G7 countries (van de Ven et al., 2018).

On the global level, a major methodological divide is evident. Many national statistical offices conducting time use surveys ask a representative sample of respondents to describe their activities in a diary format covering 24 hours of a preceding day. These descriptions are then coded into a list of relatively standardized activities. Most Latin American surveys, by contrast, administer a long list of stylized questions asking how much time respondents devoted to specific activities and purposes during the preceding week, without imposing a 24-hour constraint. Because many activities are conducted simultaneously, the sum of reported hours often totals more than the hours available (Esquivel, 2017).

On the other hand, most time diary surveys understate simultaneous uses of time, even when they encourage respondents to report “secondary” or “tertiary” activities, because they focus respondents’ attention on salient physical activities rather than background constraints or responsibilities that may require only intermittent actions, such as supervising or being on call to care for a dependent family member. Young children and sick, disabled, or frail family members often require the attentive presence of an adult caregiver. That caregiver likely devotes considerable time to activities such as cooking and cleaning, partly because she (or he) is constrained to remain in close proximity to the home.

Despite growing recognition of this issue, it remains somewhat unresolved. The International Classification of Activities for Time Use Surveys (ICATUS) represents an ongoing international effort at standardization of activity classifications. The United Nations approved a revised version in 2016, designed for consistency with

are all “regression to the mean” effects, although this position fails to explain why the diary mean should be lower than the questionnaire mean. Ongoing work comparing diary records with objective measures of time use (GPS, accelerometers, worn cameras) establishes the reliability of the diary estimates (Gershuny, 2019).

recent resolutions by the International Conference of Labour Statisticians (ICLS) and the International Standard Industrial Classification (ISIC) of all economic activities. Two regional classifications are also influential: the Harmonized European Time Use Survey (HETUS) classification developed by Eurostat, and the Classification of Time Use Activities for Latin America and the Caribbean (CAUTAL) (acronym based on the original Spanish).

These three classification schemas for time use surveys treat family care activities differently. ICATUS acknowledges forms of care that are not necessarily “active”, with categories such as “Minding children (passive care)” (code 416), “affective/emotional support for dependent adults” (code 424), and “passive care of dependent adults” (code 425) in own households. The current (HETUS) activity codes are far more abbreviated and do not include any mention of passive or supervisory care for children or adults. CAUTAL leans heavily in the opposite direction explicitly listing supervisory care (“estar al pendiente”) of children and adults who are sick or disabled, elaborating its meaning as follows: “being nearby and available to tend to them if necessary” (ECLAC, 2016). Being “nearby and available” is not an activity. A specific code for supervisory care is included both for children and for dependent or disabled adults by age categories. Unlike the other two schemas, the CAUTAL includes a code for the care of adults between the ages of 15 and 59 who are not dependent.

Many respondents may find the notion of a passive activity somewhat confusing. Ambiguity can be reduced by specific efforts to probe for supervisory time, or supplemental questions such as “Were children, disabled, or elderly in your care?” or “Who else was present while you were engaging in this activity?” However, relatively few surveys include such probes or questions, and those which do often word them in inconsistent ways. Quantitative evidence of shortcomings in the measurement of care constraints comes from diverse sources. A recent analysis of recent time use surveys from Mexico (2014), South Africa (2010), and Ghana (2009) also emphasizes problems with the underestimation of child care constraints and concludes that diary-based surveys could benefit from addition of activity-list style questions regarding simultaneous supervisory constraints. This methodological issue is particularly relevant to assessment of the effects of public investments in care infrastructure (such as expanded childcare, eldercare, and education services) on family time allocation. (Folbre, 2020).

Several other design issues are also relevant to harmonisation, including the number of time periods and household members surveyed. For instance, the Korean survey of 2014 administered interviews based on two diary days, while the Chinese national surveys of 2008 and 2018, (as well as a Chinese survey conducted by Inner Mongolia University in 2017) were conducted on one diary day. Participation rates in some specific activities (such as male participation in housework) are significantly higher when diary data is based on two days, rather than one.

Many national surveys are conducted on an irregular basis, often with significant time lags. Some randomly select only one member per household (e.g. the ATUS initiated in 2003) or only two members (such as the South African Time Use Surveys of 2000 and 2010). This makes it impossible to accurately measure average time devoted to unpaid household service work on the household level. Most stand-alone diary-based surveys fail to collect much information on the characteristics of housing, consumer durables, or utilization of public services, information especially relevant to monetary valuation of non-market household production.

The methods and challenges of valuation when using the input approach

Table 3 above provides an overview of the cost elements to arrive at a valuation of unpaid household service work using the input method. Disregarding other taxes less subsidies on production, and using consumption of fixed capital as an approximation of gross operating surplus, three cost elements need to be estimated:

- unpaid labour input;
- capital input, i.e. consumption of fixed capital and return to capital; and
- intermediate consumption.

Each of these three cost elements are discussed below in more detail.

Unpaid labour input

The Guide on Valuing Unpaid Household Service Work (UNECE, 2017) put forward recommended methodology for the measurement of unpaid labour input. This guidance note aligns with these recommendations but also raises some additional issues. To start with, when imputing a value for the labour time spent on the production of unpaid household services, two basic methods can be distinguished, leading to substantially different results⁷:

- The *replacement cost approach*, where an average post-tax, hourly wage, representative of the relevant activities covered in the production of unpaid household services, is constructed. In applying this approach in full detail, it is preferable to use estimates for the average wage costs for each of the activities separately, and to allow for quality adjustments, where possible (Abraham and Mackie, 2005).
- The *opportunity costs approach*, which takes the average hourly wage across the whole economy, thus trying to estimate the market income foregone as a result of spending time on unpaid household activities. A full application would typically calculate the opportunity costs for each relevant group of individuals, requiring more detailed and representative background information on the (potential) earnings on the labour market (e.g. information on gender, age, and level of education) of the time use survey respondents.

The opportunity cost approach is most relevant to individual's own consideration of how they should spend their time, because it informs decisions regarding utility maximization. As noted by Schreyer and Diewert (2014): "*We conclude that two elements condition the choice between an opportunity cost and a replacement-cost approach: In the general case of an unconstrained household, a first element enters the considerations: Is the purpose of valuing time spent on household production to capture full consumption (a welfare-related concept) or is the purpose more narrowly defined at capturing only the value of own account household production (not necessarily a welfare-related concept)? In the second case, the replacement cost method applies.*" However, it is also important to note that, as emphasized in Abraham and Mackie (2005), opportunity costs implicitly incorporate consumer surplus, or willingness to pay, making them inconsistent with market prices. While opportunity cost measures are certainly useful for individual calculations (such as "Should I perform this work or hire someone else to do it for me?"), they are less relevant to national accounts.

Careful application of quality-adjusted replacement cost estimates using disaggregated wage rates for different uses of time yields useful estimates of the value of unpaid household service work. However, lack of consensus regarding both measurement of time inputs and their valuation poses significant challenges. For instance, one recent labour-input based estimate of the value of unpaid childcare in the U.S. that includes valuation of supervisory care yields results that are far larger than previous estimates applying otherwise similar methods; see Suh and Folbre (2016) and Bridgman et al (2012).

Also problematic are possible divergences in the productivity of the labour input and the quality of the product. For example, taking care of multiple children in a kindergarten setting is likely to be more efficient than taking care of one's own child due to the higher child to care giver ratio, although on the other hand, the quality of the service of (grand)parents taking care of children is probably much higher. A second example of these problems to arrive at a truly market-equivalent pricing model concerns the preparation of meals, where one

⁷ An alternative approach consists in taking into account information on experienced well-being, as available in a number of time use surveys, to derive a relative price of an hour spent on unpaid activities in relation to the price of an hour spent on paid activities, thus trying to correct for any differences in experienced well-being between these two types of activities. In this method, the line of reasoning is that, if a person regards paid work twice as unpleasant as unpaid work, the monetary value he/she attributes to paid work must be twice as high as the price of unpaid work, in order to get engaged in paid work activities. This information allows for the construction of the so-called U-index (see Kahneman et al, 2004), which measures the proportion of individuals who are in a negative state of mind during a given activity. For example, in the USA, the proportion of individuals who are in a negative state of mind during paid work is 25.6%, whereas this figure is 11.6% among those who engage in unpaid activities. This means that, on average, paid work is regarded as 2.2 times more unpleasant than unpaid work in the USA, implying that the value of an hour worked on unpaid activities should be equal to 45.5% (1/2.2) of the value of an hour spent on paid work (this latter being approximated by the wage rate). It should be noted, however, that the goal of this method is to derive a direct measure of utility, instead of trying to arrive at a market-equivalent price of the services produced, which would be more in line with national accounts principles.

may assume that a highly trained professional cook is more efficient and most probably provides a higher quality product than someone preparing a meal at home for the family. The output value of an hour's work by a professional cook will therefore usually be higher than that of an average individual spending an hour on preparing meals at home. Although, using this example, one may also argue that in other cases the quality of the meals prepared at home, for a variety of reasons, may actually be of a higher quality than out-door dining. As it is practically impossible to take into account all these differences in productivity and quality, one usually considers them to be non-existent, as a consequence of which the above methodology of using a costs-based approach is likely to lead to an overvaluation of the unpaid household services produced within households.

Capital input

The input of capital, or capital services, another component of the input-based methodology, are related to the use of various consumer durables in the production of unpaid household services, such as household appliances (COICOP-item 05.3); tools and equipment for house and garden (05.5); and purchases of vehicles (07.1). A problem in relation to the first two categories is that significant one-off purchases, for example fully equipped kitchens, may be recorded as a non-distinguishable part of purchases of dwellings. Furthermore, when renting a dwelling, the use of these appliances may be included, as part of the rentals paid. With regard to purchases of vehicles one also needs to take into account that part of the transport services produced with these capital goods may be related to paid employment and leisure.

As these goods typically have a service life which goes beyond one year, it is preferable to estimate a value of the capital services that can be derived from using the capital goods over their entire service life, instead of using numbers on the annual purchases. Capital services consist of the costs related to the depreciation of the relevant equipment and a return on the invested capital. They can both be estimated by applying the Perpetual Inventory Method (PIM), according to which the gross capital stock is calculated as the sum of past purchases, adjusted for price changes, and also adjusted for the retirement of the durables after the end of their service life. The net capital stock is set equal to the gross capital stock minus the accumulated depreciation. Important pieces of information to apply the PIM are a sufficiently long time series of investments in the relevant consumer durables and information about their service lives. From these measures, the two elements of capital services, depreciation costs and return to invested capital, can be derived relatively "easily", although in the case of the latter component one also needs to make an assumption on the interest rate to be applied. Here, one could use, for example, the interest rate on debt securities issued by central government, or alternatively, a fixed interest rate of 4%.

Intermediate consumption

Looking at the products which are used as intermediate consumption in the production of unpaid household service work, three (potentially) important categories can be distinguished: food products that are being used for the preparation of meals, products related to travel activities, and products related to repairs and maintenance of consumer durables and dwellings. There actually may be other (intermediate) products that are used such as cleaning products for routine housework, but these are considered negligible as compared to the products already mentioned.

In distinguishing the intermediate products, one would prefer to have a relatively neat distinction between food products that are actually being used for the preparation of meals versus other food products. Here, it is proposed to simply include all food products included in items 01.1.1 to 01.1.7 of the Classification of Individual Consumption according to Purpose (COICOP), thus leaving out items that generally do not need any preparation, such as 01.1.8 - Sugar, jam, honey, chocolate and confectionery, and 01.1.9 - Food products n.e.c. This grouping would also exclude beverages, alcoholic as well as non-alcoholic; food products sold for immediate consumption away from the home; cooked dishes prepared by restaurants and catering contractors for consumption off their premises; and food products sold specifically as pet foods.

In respect of travel services, the most significant candidates to break out are petrol, regular maintenance and (purchased) repair services. In this case however, one cannot allocate the full amount of the relevant products to the production of unpaid household services work, as a significant part of the transport services is related

to paid employment and leisure. One could possibly compile more detailed estimates of the various categories based on transport statistics covering data on kilometres travelled for various purposes.

In the case of repair and maintenance of consumer durables and dwellings, especially the intermediate consumption for the purpose of “do-it-yourself” activities related to dwellings may be quite significant. Here, one needs to make a distinction between major renovations, which are typically recorded as part of investments, and regular maintenance and small repairs. In the latter case, national accounts make a distinction between “... *more substantial repairs, such as replastering walls or repairing roofs, carried out by owners, (which) are essentially intermediate input into the production of housing services ...*” (2008 SNA, § 6.36), and minor repairs which are typically done by tenants. In the current system of national accounts, intermediate goods used for the former type of maintenance would end up as intermediate consumption of housing services, whereas goods used in the latter type are recorded as final consumption expenditure. Therefore, if one wants to do it conceptually right, one would need to make two adjustments: moving part from intermediate consumption of housing services, and moving part of final consumption expenditures.

All in all, it may be quite complicated to disentangle the relevant goods and services which feed, as intermediate consumption, into the production of unpaid household service work. For reason of simplicity, the possible impact of intermediate consumption in the valuation and recording of unpaid household activities could be ignored. This is not that problematic, as in the usual methodologies for valuing output of unpaid household services, the impact of including intermediate consumption on GDP and household final consumption will be zero. It would only lead to a higher value of output and intermediate consumption of unpaid household service work, leaving GDP unaffected. For household final consumption, it would only lead to a reallocation of the goods and services immediately used up in the production of household services (e.g. food products) to the consumption of unpaid household services.

Practical experiences of valuing unpaid household services work using the input

Many early efforts at valuation focused on valuation of labour input alone, highlighting the relatively large amount of time devoted to unpaid household service work relative to formal work on the market (Goldschmidt-Clermont and Pagnossin-Aligisakis, 1999). Many studies have focused on the European Union, including one that merges information from the HETUS and the European Survey of Income and Living Conditions (EU-SILC) (Giannelli et al, 2012). An analysis of data for 25 OECD countries found that the labour devoted to unpaid work (estimated at replacement cost) ranged from 19% of GDP in Korea to 53% for Portugal (Miranda, 2011). Valuation of unpaid household labour inputs has also been applied to the historical economic growth record of the USA (Folbre and Wagman, 1993; Wagman and Folbre, 1996) and to a number of developing countries (Hamid, 1994; Kulshreshtha and Singh, 1996; Abrigo and Abrigo, 2019).

Several recent international studies include estimates of other inputs, such as capital services, coming closer to a national accounts framework (Ahmad and Koh, 2011, van de Ven and Zwijnenburg, 2016; van de Ven et al, 2018). The results show wide variation: the imputed monetary value of unpaid household service work, based on replacement cost method for labour input, ranges from 13.3% of GDP for the USA to 41.9% for Spain (van de Ven and Zwijnenburg, 2016). Interestingly, because the percentage of total work time devoted to unpaid household service work varies relatively little across high-income and low-income countries, the percentage adjustments to GDP based on its valuation vary less than might be expected (Ahmad and Koh, 2011).

Finally, many countries have developed specific satellite accounts incorporating the value of unpaid household services, including, for Australia (ABS, 2014), Canada, Finland, Germany, Hungary, Italy, Japan, Korea, Mexico, Norway, Switzerland, United Kingdom (ONS, 2017), and in the USA (Bridgeman et al., 2012).

The methods and challenges of valuation when using the output approach

As an alternative to measuring unpaid household service work by using the input method discussed in the above, one can also apply a method which has been termed here as the output approach. The starting point for measurement in this approach is the unit of service produced and consumed. These may also be measured in

units of time, but more frequently other units may be used, such as calories of food consumed or miles travelled when transporting your self or others. Table 4 below shows the basic ingredients for the compilation of estimates when applying the output approach. The application of this method also allows for the estimation of labour input, after adjusting gross value added for the amount of capital services, and thus provides a way of validating the results, by comparing the value of labour input resulting from this residual approach with, for example, the replacement cost method using the input approach.

Table 4. Components of the output approach

Component	Description in the context of unpaid household work
Units of a service produced and consumed	The volume of units of a service produced and consumed. This may be measured in time, distance, calories or in megabytes of information downloaded, depending on which service is being measured
Valuation of units produced and consumed	A market-equivalent price is selected which closely represents the value of the unpaid household service which is being consumed
= Output (at market-equivalent prices)	The valuation of output is equal to the units produced and consumed * the market-equivalent price
- Intermediate Consumption	The value of goods and services which are consumed in the production of unpaid household service work
= Gross Value Added	The sum value of output minus intermediate consumption

One of the main advantages of the output approach, other than its comparability with market-equivalent services in the 'core' accounts, is that it is not reliant on relatively expensive and difficult to collect time use survey data. However, the caveat which comes with that benefit, is that it tends to require data from other sources which can also be difficult to acquire, expensive or even burdensome on respondents. Furthermore, it is possible that time use data are used to create output approach based valuations, by measuring household consumption of certain unpaid services as the difference between an estimate of the total services consumed and the purchases of the relevant services on the market. In practice though, in absence of time use data, other data sources can be used to establish units of a service consumed.

Table 5 outlines some of the areas where the output approach may be used to estimate the value of unpaid household service work and how units of consumption may be established, obviously dependent on the data sources being available. Additionally, it may also show to be quite difficult to establish data sources for some types of unpaid household service work. For example, the value of shopping for clothes should initially be reliant on establishing how many beneficiaries of a shopper's hours there are in total, on the basis of which the hours of shopping service consumed can be assessed. However, without a specialised survey about shopping practice, it is highly improbable that the relevant data exists.

Table 5. Examples of consumed units of unpaid household service work

Type of unpaid household service work consumed	Example of units
Adult care or childcare	Care time received per adult or per child
Nutrition	Amount of calories eaten in, excluding meals produced by market services outside of the household

Transport	Number of miles/kilometers travelled by individuals where no-one else was transporting them (i.e. the traveller was walking, cycling or driving themselves). Distance as a passenger would be excluded.
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More generally, it should be noted that in cases where the units of consumption can be estimated for a given unpaid household service, a valuation is still dependent on being able to find a suitable market-equivalent price, representative of the quality and characteristics of the unpaid household service being performed. It may be the case that a suitable data source for tracking the average price of the relevant service is available, but if the data is not available, then it becomes unfeasible to produce the output valuation.

As a comparison, the input approach requires a good quality time use survey and a survey tracking average wages for different occupations, and after some adjustments for capital services, it is then possible to derive a (gross value added estimate for all the subcategories of unpaid household service work with just two main data sources. Where the output method is being used, it may be necessary to find two relevant data sources for each type of unpaid household service work, meaning it could require upwards of 10 data sources just to create estimates for five types of unpaid household service work.

Once the value of output has been estimated using the output approach, it is still necessary to deduct the value of intermediate consumption of goods and services, in order to arrive at an estimate of gross value added. Intermediate consumption concerns goods and services that are immediately, i.e. within the same year, used up in the production of other goods and services. As noted before, obvious examples are food products and electricity/gas for preparing meals; energy consumption and maintenance costs in the case of transportation; etc., for which it may be difficult to distinguish them from similar types of goods and services that are directly used for final consumption purposes.⁸

Use of market-equivalent prices to value unpaid household service work also comes with similar types of quality considerations as the use of market-equivalent wages. Although the output of unpaid household service work constitutes a substantial part of a country's economy and the services provided are similar among countries in many ways, there are of course still differences in the quality of services provided by paid employment and the services provided by unpaid employment. These differences might be due to differences in the quality of the inputs used, differences in the technology used to provide the services, and differences in the level of instruction of the person providing the service.

The treatment is different for market services and non-market services in the system of national accounts. The unit price of a market product corresponds to the amount of money the purchaser pays for it. In the absence of a market price for the unit, the unit cost of a non-market service, calculated as the sum of costs, is often used as a proxy for the unit price. Therefore, in absence of a market service that is similar to the service provided by unpaid employment, the unit cost can be used as a proxy of price. Accordingly, where it is possible to define units of quantity for non-market services, it is also possible to apply the principles for calculating volume and price indices. It is generally possible to define units of quantity for non-market services, which are consumed on an individual basis, such as childcare, adult care, nutrition, transport, and information services. Note that it may not be straightforward to also capture possible quality changes, which are also considered as changes in the volume, and not changes in the price, of the units of services provided.

Early adopters of the output valuation approach

⁸ Please note that, different from applying the input approach, intermediate goods and services cannot be ignored when applying the output approach. Not adjusting the output value for intermediate consumption, when applying the output approach would lead to double-counting of the relevant goods and services: once as part of direct final consumption expenditure; and once as implicit part of the output of unpaid household services work. Notwithstanding this problem, for a number of services such as taking care of other people, this difference would be close to immaterial.

One particular example of where the output approach has been used successfully is in the UK Household Satellite Account. The methodology was based on early precedents for output valuation set by the pioneering work of Duncan Ironmonger (1997), who mapped household services onto a list of basic categories: accommodation, meals, clothes, transport, recreation, and care (non-household categories of volunteer work and education were also included), and outlined data needs for inclusion in input-output tables. Ironmonger also proposed a distinctive way of valuing childcare services, arguing that young children require a fixed amount of total care, subtracting the value of privately purchased and publicly provided childcare services from that total, assuming the remainder of services was provided by households.

Ironmonger's influence is apparent in the UK Office for National Statistics' (ONS) valuation of household services. For example, the total amount of unpaid childcare provided has been estimated as the total number of children in the population multiplied by 24 hours per day, minus the hours of formal childcare provided (Fender et al, 2013). This explicitly includes time that children are sleeping, on the grounds that they require supervision during this time. The market service treated as a basis of valuation are the wages of a live-in caregiver or nanny. The results inevitably yield a higher valuation of unpaid childcare services than would be estimated based on time-diary estimates of childcare activities, though, to our knowledge, no direct comparisons have been published.

Beyond the valuation of unpaid childcare the ONS have operationalised the output approach in several key areas of the UK household satellite account including unpaid adult care (valuing hours care consumed by unit costs of market or government adult care providers), unpaid transport services (valuing miles of transport consumed by a price per mile based on transport survey data) and unpaid nutrition services (valuing calories eaten in, with a price per calorie derived from eating out). However, the ONS also recognises that the output approach doesn't make time use data redundant. Rather, the ONS has found that additional time use data allows analysis of production and consumption at household and individual level which then have high impact policy applications, particularly when equality or inequality analyses are being conducted.

Some final considerations

Extended income estimates

Most valuation efforts have been directed to compiling alternative numbers for the level and growth of GDP, in a satellite accounts setting. However, the estimates are also relevant to the measurement of household extended income, i.e. the sum of market income and the implicit income derived from producing unpaid household service work. Consider, for instance, two families of identical composition, each with two working-age adults and two children under the age of 5, who both report after-tax income of \$50,000. Standard measures of equivalized family income would place both families in the same location within the income distribution. However, one family may include two full-time wage earners earning \$25,000 each, who must purchase a number of services from the market, including childcare, meals, and transportation, while the other family includes one full-time wage earner (bringing home \$50,000) and one full-time caregiver spending forty hours a week on the provision of unpaid services. Including the consumption of unpaid household service work, the second family enjoys a significantly larger level of consumption relative to its cash earnings. This has implications for both household surveys used to measure household income and also the measurement of the distribution of income, whereby if income measures become more inclusive, then arguably distribution of income measures should need to follow suit.

Time use, education and human capital

Estimates of household extended income therefore have significant implications for measures of income and consumption inequality. Because time devoted to unpaid household service work typically varies far less across households than sources of market income, valuation of this time has an equalizing effect on household income in the cross-section (Aslaksen and Koren, 1996 and 2014; Frazis and Stewart, 2011; Folbre et al, 2013). Effects on longitudinal trends are less clear. As time devoted to market work increases as a result of

the heightened labour force participation of women, the equalizing effect of unpaid household service work almost certainly diminishes.

Another important conceptual issue concerns the definition of household output. While satellite accounts typically focus on household services that contribute to total household consumption, some economists observe that the most significant output of unpaid activities is human capital itself. Kendrick (1976) argued at an early date for a cost-based estimate of the value of human capital that includes at least some childrearing costs. Nowadays, most valuations of human capital focus instead on an output measure, i.e. the net present value of future earnings (Jorgensen and Fraumeni, 1989). Valuations based on the latter method are generally far higher than those based on cost (van de Ven and Zwijnenburg 2016; UNECE 2016).

Furthermore, some economists have developed dynamic input-output models of inputs into human capital, arguing that it should be moved inside the production boundary (Aulin-Ahmavaara, 2004). In other words, a significant share of unpaid household activities, among which also studying at home, should be looked upon as an input into the investment of human capital on own account. This issue falls into a larger category of concerns regarding the asset boundary of the (2008) SNA; see e.g. Moulton and Mayerhauser (2015). More discussion on the recording and measurement of education and human capital, including the treatment of related household activities, can be found in the relevant guidance note, also drafted under the umbrella of the ISWGNA Subgroup on Well-being and Sustainability.

Unpaid care from a healthcare perspective

For healthcare purposes, a further breakdown of unpaid care is usually made to distinguish health care from social care activities. *Long term care (health)* is characterized by providers helping with what are known as Activities of Daily Living (ADLs). These include personal care services such as eating (support with food intake), bathing, washing, dressing, getting in and out of bed, getting to a from the toilet, and managing incontinence. *Long-term care (social)* is characterized by what are known as Instrumental Activities of Daily Living (IADLs) which include doing the shopping, laundry, cooking, performing housework, managing finances, and making telephone calls on behalf of other adults or children, when they lack capacity to do so for themselves. Under these definitions, only ADLs would be included in unpaid childcare while IADLs would be included in other categories of unpaid work. For example, help with cooking would be included under the nutrition category and help with laundry would fall under the provision of laundry services. However, both ADLs and IADLs would be included in unpaid adult care.

As a result, effective accounting of unpaid childcare for health accounting also requires a further split of unpaid work based on whom the beneficiary was for the unpaid service and the reasons the service was provided. Activity such as feeding, washing, shopping or laundering clothes on behalf of children with health or social care needs in excess of those for children of a similar age without those needs, should be able to be identifiable in the data so that it can be measured for health accounting purposes, and childcare for other reasons can be excluded. However, at the current stage in time it is not yet clear how this will be possible in practice and will require further research as a result.

Volume estimates of output and value added of unpaid household service work

In the above, attention is paid to arriving at current price estimates of output and value added on unpaid household service work. This is no doubt a very useful first step, but future users of such extended accounts on unpaid household services will likely want to see results in volume terms as well. This is an area for which more detailed guidance still needs to be developed. If applying the output approach one could use the price series to deflate the current price estimates. However, even if this can be achieved, it is unlikely an output based methodology will be able to use it for all forms of unpaid work, so using the input approach might be necessary for deflating some areas. Furthermore, question is how to account, if at all, for changes in the quality of the services produced. Furthermore, in the case of applying the input approach, one would typically start with deflating the various inputs used for the production of the relevant services. However, question is how to control for productivity changes. How to account for changes in productivity, if, for example, an unpaid worker is producing services using efficiency enhancing machinery such as a washing machine, a robot Hoover

or a robot lawnmower. Additionally, although secondary activities are included in many time use surveys, it is not clear whether multitasking leads to gains in output overall and if so, what is the average productivity gain associated with multitasking. Further reflections are needed before being able to provide more detailed guidance, which will be one of the objectives in moving forward this workstream.

Recommendations:

When using the input approach:

- Time use data should be collected to produce estimates of unpaid household services. These should be produced on a regular basis, at least once every 5 years but ideally on a quarterly basis in line with the core accounts.
- A replacement cost approach to valuation of hours worked should be followed using gross wage rates. Specialist wage rates should be used but judgement should be applied to assess the suitability of some specialist wage rates for certain categories of unpaid household services. For example, where average tradesperson salaries are used, it may be more appropriate to use an apprentice or general labourer's wage rate to reflect the market premium paid to qualified tradespeople.
- Imputed adjustments for taxes and subsidies and gross operating surplus should be made, to arrive at consistency with the core national accounts and with the valuations using the output approach.
- Where time use data is not available and the input approach cannot be applied, the output approach should be used as an alternative.
- As often as possible, the output approach should be used to validate input approach estimates of the value of unpaid household services. Any difference in the valuations should be reconciled to give a final valuation for any given point of time.
- Time use surveys should be harmonised and designed to collect as much activity meeting the third party criteria as possible.

When using the output approach:

- A reliable household expenditure survey should be used to estimate intermediate consumption of goods and services purchased from the market and used in the production of unpaid household service work.
- Market equivalent prices for unpaid household services should be carefully scrutinised for their suitability with which to value particular types of unpaid household service work.
- As often as possible, the input approach should be used to validate output approach estimates of the value of unpaid household services. Any difference in the valuations should be reconciled to give a final valuation for any given point of time.

PART 2 – PROPOSAL FOR EXTENDED ACCOUNTS ON UNPAID HOUSEHOLD SERVICE WORK

Introduction

This part includes concrete proposals for extended accounts on unpaid household service work. In doing so, a logical starting point for providing an integrated view of unpaid household service work within the traditional system of national accounts is the framework of supply and use tables, more specifically the use table. In doing so, one can make a distinction between two ways of showing the impact of unpaid household activities:

- i. extending the traditional use table with information on labour input in physical units which is considered to be relevant for monitoring unpaid household activities, but without extending the production boundary of the 2008 SNA; and
- ii. including a full valuation of the provision of unpaid household service work, thereby extending the traditional production boundary.

Both ways of presentation are discussed below. Examples are presented in the spreadsheet.

Extended Supply and Use Tables in Physical Units

In the first type of extended accounts, one would add rows on the hours worked for producing unpaid household services, right below the hours worked in paid employment. It is also proposed to include memo

items for *leisure time* and hours spent on other activities not included elsewhere, to arrive at a complete accounting for the use of time. These latter hours cannot be allocated to any industrial activity, and would therefore only appear in the column for the total hours.

Two basic decisions need to be made in relation to the granularity of the information on unpaid household service work. The first one concerns the details on the characteristics of the people involved: gender, age category and/or level of education. This decision also depends on the granularity of paid employment, which is discussed as part of the discussion on the inclusion of labour accounts, as part of the objectives of the area group on education and human capital. Here, it is proposed to include breakdowns by gender and level of education, both for paid employment and for unpaid employment.

The second issue relates to the allocation of the unpaid household service work to industries, and the detail of the industrial breakdown. Here, one has to take into account the current granularity of industries in the regular compilation of national accounts. At the international level, for EU and OECD member states, the current request for supply and use tables has a breakdown into 64 different activities. In the case of unpaid household activities, out of these 64 activities the following are considered most relevant, of which sports activities and activities of membership organisations are probably more related to the various types of volunteering, although such activities may also take in residential care and social work⁹:

- land transport (and transport via pipelines);
- food and beverage service activities;
- education;
- residential care activities;
- social work activities without accommodation;
- sports activities and amusement and recreation activities;
- activities of membership organisations; and
- other personal services.

An additional consideration is whether one simply adds the unpaid household activities to the column with the services already included in the system of national accounts, or one prefers to include separate columns for the unpaid services. In this first type of extended accounts, this is of less relevance, because the hours spent on unpaid household activities are already shown explicitly, in a separate row. However, in the case of the second type of extended accounts in monetary units, it becomes important for either or not wanting to show the impact of including unpaid activities on output, value added, etc. more explicitly. Whatever the case, it would be useful to make a clear cross-tabulation of the categories typically distinguished in time use surveys and the breakdown into industrial activities.

In the extended accounts in physical units, one could also consider creating an “of which” column for final consumption expenditure, to separate out consumer durables which are used in the production of unpaid household services. As mentioned before, it is considered not feasible to separately distinguish the intermediate consumption of goods and services, which are used up in the production of unpaid household services. It may be possible to delineate, for example, the use of petrol in producing transport services, but in the case of preparing meals, it may show to be impossible to make a distinction between the items which are used up in the production of meals versus the items which are directly consumed.

In the spreadsheet which accompanies this note, all additional rows and columns of the extended accounts in physical units are highlighted in red. At this stage, no granularity has yet been included for the hours worked. Although the above proposals are relatively straightforward, at least from a conceptual point of view, they provide a wealth of additional information for policy and research. Information on structural changes between paid and unpaid employment can be derived from the tables, including the services most affected. If one also manages to include information by gender and/or level of education, it also shows the people most affected by these changes. In this respect, one could also analyse, for example, the impact of relying more and more

⁹ Note that similar considerations need to be thought through regarding the breakdown of goods and services, represented in the rows of the use table.

on informal care, the impact of lock-down measures due to the Covid-19 crisis, or the impact of the digitalisation of the economy.

In the third part of this guidance alternative physical unit time-based accounting practices which deviate more radically from the existing SNA framework are discussed. These alternative approaches may be constructed as additional optional tables which could be created in parallel with the wider SNA, rather a replacement.

Extended Supply and Use Tables in Monetary Units

The second type of extended accounts goes a major step further, by putting a value on the unpaid household services produced. A numerical example of the implications of such a change in the traditional production boundary is shown in the spreadsheet as well, the changes being highlighted in blue.

First, the consumer durables used in the production of unpaid household services are shifted from the column for *household final consumption expenditure* to the column for *gross capital formation*. The additional consumption of fixed capital, gross fixed capital formation and capital stock have also been included as additional rows. Total capital services can then be calculated as the sum of the consumption of fixed capital and the return on invested capital. The latter is assumed to be equal to 4% of the capital stock. To arrive at total output of unpaid household services, the labour input still needs to be added to the capital costs. In the example, it has been assumed that the hourly wage is 10.

To give a concrete example from the spreadsheet, in the case of transport services (column I), it has been assumed that gross capital formation in vehicles is 750, while the net capital stock, i.e. the accumulated value of past investments adjusted for depreciation, amounts to 7,500. Furthermore, the unpaid hours worked in transport services are assumed to be equal to 100. Using a sum of costs approach, output and value added (2,100) can then be calculated as the sum of following items:

- Compensation of employees: $100 * 10 = 1000$
- Consumption of fixed capital: 800
- Return on invested capital: $4\% \text{ of } 7,500 = 300$

From such a table in monetary units, one can directly arrive at the impact on GDP of including unpaid household service work into the production boundary. If one would distinguish separate columns and rows for unpaid household activities, such a table could even be disseminated without necessarily “compromising” GDP according to the current definition.

Alternatively, when the impact of unpaid household service work is factored into GDP, this could be expressed as an alternative concept to the traditional ‘standard’ definition of GDP. It is important to recognise that this alternative GDP is not to be considered as a replacement for the ‘standard’ GDP. This guidance rather recommends creating these extended estimates of output and value added in addition to standard GDP estimates. It is clear though that all of this needs careful communication, to avoid confusing users. It is proposed that the Task Team on Communication further reflects upon this issue, also taking into account other potential extensions and re-definitions of the ‘standard’ GDP, as part of the work on defining a broader framework of national accounts to capture wellbeing and sustainability.

Recommendations:

- Extended supply and use tables, including unpaid household service work, should preferably be compiled both in physical units and in monetary units.
- Estimates of extended GDP factoring in unpaid household service production should be calculated to accompany the ‘standard’ GDP measure. Divergence of growth rates between the two may indicate activity shifting across the production boundary, and the extended GDP may give a more accurate representation of economic growth that is also better aligned to experienced economic welfare.
- To avoid distortions associated with monetary valuations, additional physical accounting may be added to supply and use tables.
- Some further research is needed to define whether industry breakdowns within existing supply use tables are optimal for unpaid household service production and the estimation of extended GDP.

- It is suggested that the Task Team on Communication has a further reflection on the terminology and presentation of extended macroeconomic indicators, and extended accounts more generally.

PART 3 – OPTIONAL PARALLEL TIME BASED ACCOUNTS

An alternative to the monetary approach of valuing unpaid activity within the wider SNA framework may be to avoid primarily relying on transforming activity into value and focus instead on accounting for changes in physical units of economic activity (in terms of time). Where the second part of this guidance proposes basic physical accounting for hours in extended SUT tables, the last section outlines a more radical and experimental set of time accounting approaches. These approaches can be used to take a more direct measure of household welfare, determining how the population’s time is spent and potentially weighting that time by some measure of quality or enjoyment. At stages, time based accounting can involve reversion of monetary valuations back into labour hours but predominantly it is focussed on how households allocate their time to the production of consumption of different types of good and service. The implication of this, as with the Extended Supply and Use Tables in Physical Units set out in part 2, is that the time accounts represent a more realistic depiction of the household experience. If these time-based accounts can then be acted upon by policy makers, it may then lead to better welfare outcomes than a set of accounts based on monetary valuations.

Full time-use accounting: time budgets as exhaustive accounts of national economic activity

In the first instance, prior to applying any valuation techniques, the time producing and consuming unpaid household service can be measured in physical time account. The benefit of this is that it represents a complete record of the 24 day across the population. In practice it addresses Stiglitz, Sen and Fitoussi’s (2009) recommendation of adopting the household perspective, although it stops short of creating a monetary valuation consistent with the wider framework of the SNA. Where time budget accounting is effectively an alternative to the monetary SNA it can be recommended as an alternative approach which can be run in parallel to the SNA framework to evaluate national well-being without the issues or distortions which use of monetary specialist or generalist wages, shadow wages or shadow prices can result in.

The SNA does not provide exhaustive accounts of economic activity. Time-use accounting is needed because technical and organisational innovations shift economic activity, sometimes into, sometimes out of, the money nexus (eg substituting TV for cinema, private cars for public transport or vice versa, domestic washing machines for laundries, on-line Expedia for high street Thomas Cook etc.) in complex ways that are invisible in the SNA.

The essence of time accounting is mapping all the activities of daily life onto economic activity. The latter is all classifiable as production, consumption (as distinguished by the “third person criterion”) or a combination (“joint production”) of these. And, imports and exports aside, there is no production or consumption that does not relate directly or indirectly (ie as “intermediate production”) to one or other of the activities of daily life. A properly designed, nationally representative time-use diary survey (TUDs), comprehensively covers all the daily activities of the nation. Correctly mapped it should therefore in principle *exhaustively correspond to, in effect account for, all economic activity*.

Each item of production, paid or unpaid, has a monetary value identical to each corresponding item of consumption. This was the principle underlying the ONS’ pioneering report on Experimental Extension Accounts (Holloway et al 2003.) So, if we apportion time spent in joint production between the other two time-use categories, production and consumption, we can generalise the conventional accounting identity of the money value of SNA production to SNA consumption, to become an identity between the value of *all* production time and that of *all* consumption time, both inside and outside the money nexus—providing, for the first time, a *demonstrably* exhaustive economic accounting.

Table 6: 55 years of UK National Time Budgets (minutes per day, UK adults aged 18+)

	1961 _____		2015 _____	
	UK	Non-	UK	Non-

Categories of want:	Consumption time	Unpaid	Paid	Total	Imported	Consumption time	Unpaid	Paid	Total	Imported
Sleep	502			502		511			511	
Food & shelter	149	157	88	394	33	143	135	51	329	17
Home Leisure	261	8	17	286	4	258	24	13	294	2
Leisure, shops	57	28	28	113	5	65	80	21	166	3
High end servs	9	0	46	55	4	18	11	53	82	2
Infrastructure services			32	32	2			26	26	1
Exported work time			57	57	12			33	33	8
TOTAL	978	193	269	1440	60	1020	265	196	1440	34

We can, reasonably straightforwardly, operationalise these time accounts. The green cells of Table 6 are calculated directly from the UK TUDs conducted in 1961 and 2014-15. The changes between the two years show effects both of demographic factors and techno-organisational innovation. Less paid work because the population base includes more pensioners and more students. Less unpaid “food and shelter”-related unpaid work because of the diffusion of labour-saving technologies, while the growing unpaid work here associated with home leisure, is constituted by growth in childcare time. The increasing unpaid work associated with out-of-home consumption, is shopping and associated travel (supermarkets, parking and queuing), and the new unpaid work time associated with high end services is, inter alia, private internet use for medical educational and other services. The remaining cells are calculated from monetary expenditures, combining family expenditure data and data on goods and services provided to private individuals and households free at the point of consumption, with input-output (IO) data.

The expenditures and “free” provisions are associated with the different sorts of consumption—or “categories of want”—on an *a priori* basis. All of the society’s final output—everything that crosses the SNA production boundary (SNAPB)—is assigned to one or other of the categories of want (Table 7). Next, the money values of these SNA final outputs are associated in turn with money valued output from the originating industries, and these are finally converted to time values using an hours-and-earnings survey (such as the LFS). In a fuller implementation the paid work time column would be split among different occupational or human capital levels. The input-output tables also provide information both about the value of exports, and about the contribution of imports to each of the categories of want. The estimates of imported labour time is, for the moment, based on UK labour productivity levels.

Table 7: Comprehensive assignments of items of final output to categories of want.

	Gross Domestic Product, in money values	
Categories of want:	Household expenditure on goods and services	Services provided free at point of consumption

Sleep, shelter and nutrition	house purchase/rent, white goods, clothes, materials, maintenance, cooking equipment, food and other materials	public housing, sewerage
Home leisure	entertainment equipment, computers, cable, internet etc. subscriptions	public and commercial radio and television, free internet content
Out-of-home leisure, shopping	car purchase etc, transport services, cinema, concert etc tickets, restaurants	publicly provided transport and telecommunications infrastructure
High-end	educational fees, medical, insurance, other	public medical, educational. social services
Infrastructural		defence, courts, prisons, policing, roads
Exports		exports of goods and services

Within the time budget accounts, investment expenditures are represented as part of current output. Investments are treated as semi-finished products, part of intermediate costs of production. The payments in the investment rows of the IO tables are reassigned to their destination industries, so the labour embodied in the plant and equipment used in production is included in the relevant cells of Table 6. Investments vary substantially from year to year, while most other components of time budgets are relatively stable. So to avoid excessive annual fluctuation, it may become necessary, as the Time Budget Accounts develop, to average investment expenditures across a sequence of years and treat the time budgets as relating to a multi-year period.

This time budgeting approach to national accounts brings with it a need for extra care in distinguishing intermediate from final production which crosses the SNAPB. The most important case is advertising expenditure, which may be mistakenly attributed as an intermediate cost of production of the industry paying for the advertisement. In the context of the time budget accounts, however, where the interest is in the *use to which the product/service is put*, it emerges that advertising activity must be treated as an example of joint production: part to the sponsoring industry, and part to the media production and/or web platforms that are supported by the expenditure. So the television programmes whose production forms the bulk of the cost of TV advertising should be treated in these accounts as “services provided free at the point of consumption” (SPFPC)—since the labour time associated with the TV production should be matched to time spent watching television. In the UK broadcast BBC programmes have been treated as final output whereas (advertising-funded) commercial TV as been treated as intermediate. Now global advertising expenditure on internet provider such as Google and Facebook—which enables SPFPC provision of online services—exceeds television advertising expenditure so the issue becomes pressing.

The “input” approach to valuing unpaid work is discussed at length in this report. In essence it involves multiplying the cells of the “unpaid work” columns of Table 6 by appropriate “market equivalent wage” rates, and transferring some goods and materials (such as raw and semi-finished foods and domestic equipment) that cross the SNAPB, as intermediate inputs to unpaid production. There is also a corresponding “consumption approach” or “output approach”, (Goldschmidt Clermont, Ironmonger) that places a market value on each instance of consumption found in the TUD data—in effect placing money values on each cell of the consumption time columns in Table 6. This was the innovation in Holloway’s 2003 ONS report: for each row in the 1961 and 2015 panes, the money value of the time in each consumption time cell must be identical the total of the values of the corresponding unpaid work time and paid work time cells—the output value. Holloway used the requirement for identical output and consumption values for each class of provision, providing, in effect, a reality check against inflated values for unpaid output.

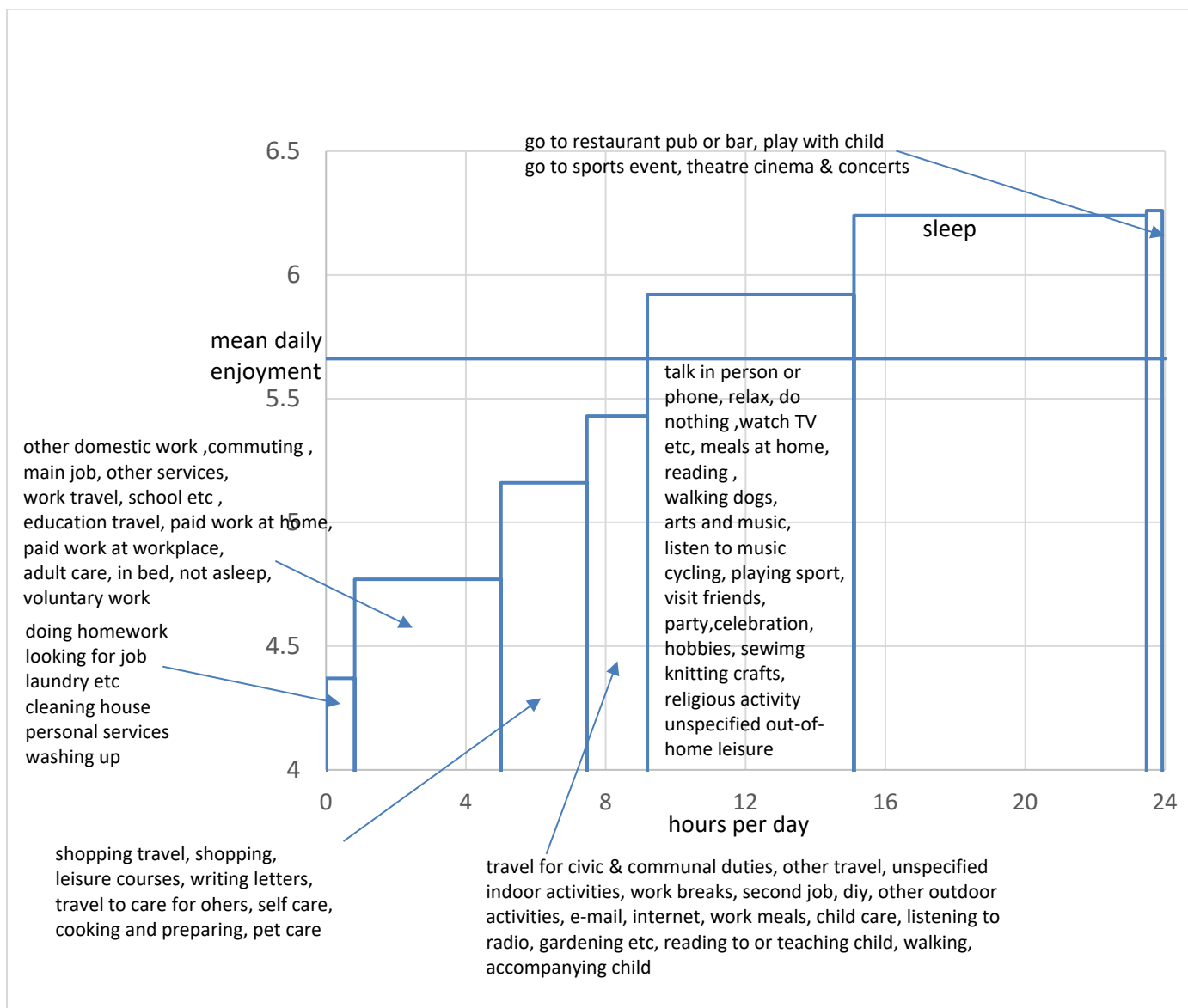
Accounting for economic activity using time diary materials

Holloway’s report was written without TUD data—the UK 2001 study was only released in 2002, after her work was completed—instead she deployed rather piecemeal information on consumption from market research surveys. The now widespread availability of substantial nationally representative TUDs—the American Time Use Study started in 2003, the first wave of the Harmonised European Time Use Study, elements of which became available from 2000 onwards, other national studies in North America, India and

Pakistan, Australasia, and other Pacific Rim countries now enables the construction of (much more detailed) versions of Table yy for much of the developed world and an increasing number of less developed countries.

The time use accounting described so far represents a logical extension of the essential (Kuznetz 1943) principles of the SNA to include non-monetized production (as proposed by Kneeland 1929, Reid 1933). Using time rather than money has an incidental advantage, substituting a finite quantum—the 24 hours of the society’s Great Day—for an infinitely expansible total of money. The time accounts are entirely free from the inflationary tendencies associated with the price system. The exhaustive nature of the whole-day, production-identical-to-consumption system set out here, implies a particular sort of limit to growth, in which historical changes of the sort set out in Table 6, must be evaluated to see if they produce real social betterment, considering whether the “wants” (corresponding to the Z-goods in Becker’s 1965 model) are better satisfied, and (once we disaggregate the accounts in the form of a time-based Social Accounting Matrix) how the improvements are distributed across the society.

Figure 2: Mean enjoyment of time, UK men and women aged 15 and older, 2015



There are further applications of the time budget accounting approach. The production/consumption identity follows the means/end dichotomy that lies at the heart of most economic. Production is just a means, to the end of consumption. But, as pointed out elsewhere in this report, it is often difficult to distinguish between unpaid work and leisure. And, in some occupations at least, paid work also has many of the affectively positive characteristics—challenge, sociability, enjoyment—often found in leisure pursuits. The third person criterion, in short, breaks down under close scrutiny. This is the reason that Section 5.8 above considers an alternative approach in which *all* the activities of daily life, work *and* leisure, contribute to feelings of enjoyment or well-being. Each of the cells of each panel of Table 6 can be multiplied by a mean experienced enjoyment rate based on the enjoyment field associated with each daily episode collected in many modern TUD surveys, to produce a summary “activity process benefit” (Juster and Stafford 1965).

Figure 2 is a base-proportional histogram which regroups the activities of the day according to their mean enjoyability across the population. Homework, laundry, washing up, are on average among the least enjoyable activities as registered in the UK 2015 TUD; restaurants and other sorts of “going out”, and playing with children are the most enjoyable—though these are only slightly more enjoyed than sleep. The x-axis of the figure represents the 24 hours of the Great Day, the y-axis the mean enjoyability of each of the groups of activity. The areas thus represent the relative contributions of the groups of activity to the overall mean utility—or the “hedonic” value—of the day.

Psychologists contrast hedonic values with “eudaemonic”—more distanced and evaluative, considering the implications of the daily (and longer-term) balance among different work and leisure activities for satisfaction with life and the achievement of life goals. The relationship between the two distinct sorts of evaluation is not yet well understood. But the TUDs now routinely collect questionnaire batteries on life-satisfaction and happiness in parallel with the hedonic measures in the diaries.

So the time budget accounting approach provides several different ways of representing well-being. As well as producing money-based welfare estimates by multiplying durations by actual or market equivalent wages or prices, it can also produce hedonic values, by multiplying those same durations by the enjoyment evidence also collected in TUDs. And—though this promise is not yet forthcoming—they are likely also to contribute to the understanding the determinants of eudaemonic well-being.

Recommendations:

- Time accounting approaches may be set up to run in parallel to the wider SNA framework to provide a table which aligns as closely to the household perspective as possible. However, further research is needed to define the most effective user applications of such tables, particularly from a welfare policy perspective.

PART 4 – CONCLUSIONS

The valuation of unpaid household service work is necessary to better measure total economic growth and living standards. To that end, this guidance note sets out to build on existing guidance such as that given in the UNECE guidance for valuing unpaid household work (UNECE, 2017) in such a way that can inform the development of the existing 2008 SNA guidance. To match a diverse range of user needs, this guidance has revisited the third-party criterion and re-evaluated what should be included as forms of unpaid household service. In doing this, it has also considered how the area of unpaid household service work overlaps with the areas of development in the SNA such as informal healthcare and informal education. The note discusses the challenges associated with measurement of unpaid household service work and then offers best practice proposals for valuation methods. Finally, the note has questioned if valuation is necessary for all purposes, proposing parallel physical accounts where they may be more closely aligned to day-to-day household experiences.

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