

Household Satellite Accounts, Valuing Informal Childcare in the UK

Author Name(s): Valerie Fender, Rosemary Foster, Atif Khan, Sue Punt and Gerard Carolan;
Office for National Statistics

Abstract

This article reports on the measurement and valuation of the output of the household production of childcare. This includes all care given by parents, family members, friends and focuses on the numbers of children looked after, rather than those giving the care. It is the first in a series of articles to update the full household satellite accounts (HHSA) for the UK. The methodology remains under development and any estimates reported here, or in forthcoming publications, should be considered experimental and interpreted with caution.

Key Points

- This article reports on the measurement of informal childcare by households which is outside the scope of National Accounts and therefore Gross Domestic Product (GDP).
- Formal childcare per child for children under 5 years old increased by 36.4% between 1995 and 2010.
- Between 1995 and 2010 there was a movement away from informal childcare in the household towards formal childcare for children aged under 5 years old.
- The value of informal childcare in 2010 was £343 billion (valued using gross wages), this is equivalent to 23% of GDP.

Introduction to the Household Satellite Accounts

In 2002 the Office for National Statistics (ONS) published the first Household Satellite Account (HHSA) for the UK, which measured and valued the unpaid goods and services produced by households ([ONS, 2002](#); [Holloway, Short & Tamplin, 2002](#)).

Following the publication of the Report by the [Commission for the Measurement of Economic Performance and Social Progress \(2009\)](#) there has been fresh interest in valuing household production. As such, as part of the Measuring National Well-being programme ONS is currently updating the HHSA which measure household production in the UK. The value of informal childcare is the first of the eight HHSA modules to be updated.

Household production is all unpaid goods and services produced by households in the UK. Conventional National Accounts measurements, such as GDP, do not fully take into account of these goods and services. However, if these goods and services are paid for they are included as part of the National Accounts. For example, if I were to iron my own clothes this service would not be included, however, if I were to pay someone to do it for me it would.

The HHSA provide a means by which the influence of changing patterns of unpaid work on the economy can be measured. The information will also be of use to policy makers who need to take significant amounts of unpaid work into account.

This work falls outside the scope of the UK National Accounts. This is because the inclusion of all activity which is productive in the economic sense but which does not have a monetary value, would swamp the monetary flows, obscure what is happening in the markets, and reduce the usefulness of National Accounts data for analysis. HHSA is therefore separate from, but conceptually consistent with the UK National Accounts.

The HHSA extends the National Accounts boundary to include all activity that could be delegated to another person. This activity is divided into several principal functions providing housing, transport, nutrition, clothing, laundry services, adult care, child care and voluntary work. The approach being taken by the ONS is to focus on the outputs of these principal functions.

The methodology remains under development and any estimates reported here, or in forthcoming publications, should be considered experimental and interpreted with caution. ONS welcomes comments and feedback on all aspects of the methodology used and the assumptions made, and seek suggestions for further/alternative data sources. A more detailed description of the methodology and assumptions made can be found in the appendices of this article.

What is Formal and Informal Childcare?

As most of the childcare carried out by household members or their networks (family members or neighbours) could be delegated to another person, it is deemed to be part of the productive role of households.

The definitions of formal and informal childcare vary between different surveys and projects. Definitions of formal childcare can vary from including only childcare that is registered and paid for (for example registered childminder places for the under 8's), to also including care which is formalised by payment but unregistered (for example unregistered childminders and nannies).

Reflecting this, the definition of informal childcare can also vary. Informal childcare is often defined as unpaid care. This usually refers to care given by family members such as grandparents and siblings, as well as friends; but does not usually include care given by parents. Alternatively, informal childcare can be defined as care which is unregistered even if paid for, so paid babysitters and unregistered childminders could fall into this category. This is still referred to as informal care because the arrangements are not formalised with contracts or employment rights.

The HHSA definition of informal childcare is all care which does not involve a monetary transaction and therefore includes the childcare of parents and other family members. It is the total amount of

childcare required (total number of children in the population multiplied by twenty four hours a day) less any formal childcare, defined as all paid childcare, whether it is registered or unregistered.

Within this definition of informal childcare we have not tried to distinguish between physical acts of supervision or help and the building of parent-child relationships, which obviously cannot be delegated. By using a residual approach to estimate informal childcare we are accounting for all the time a child needs supervision. This supervision can be 'active' or 'passive'. Passive care includes the time when an adult may not be directly interacting with the child, but is still responsible for them. The important point is that if no unpaid carer were available, a third person would have to be paid to take their place. Therefore passive care is part of the productive role of households and is included in our estimates. One simple way of distinguishing between passive and active childcare is to look at waking and sleeping time. If we assume a child under 5 sleeps for twelve hours, we can say that 50% of their childcare is passive, and so on.

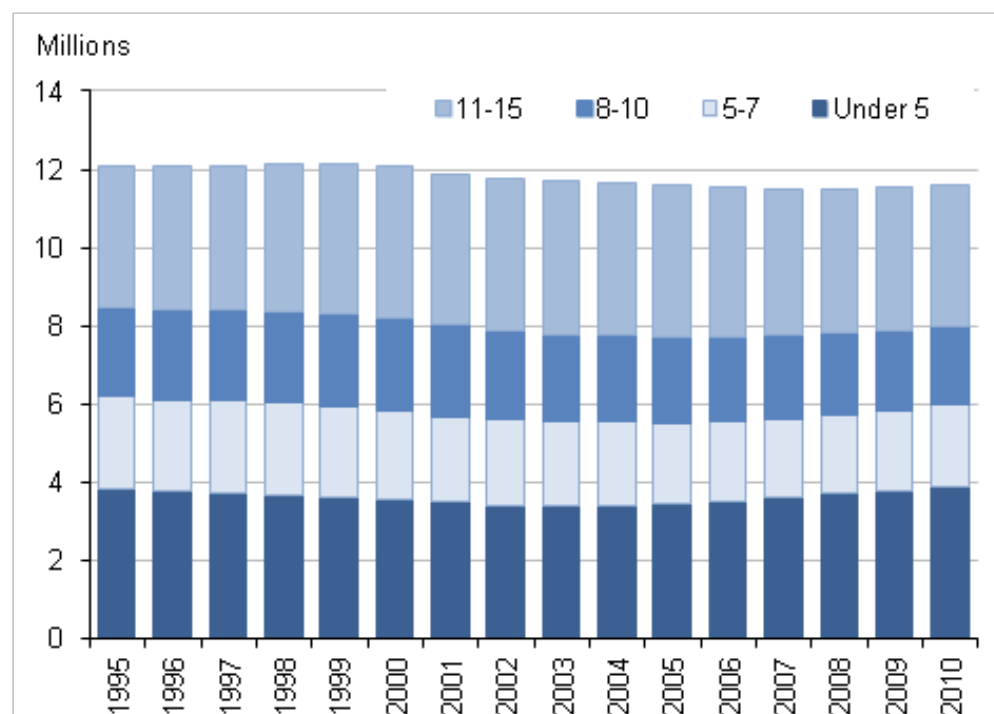
As children get older, some of them are left unsupervised for varying amounts of time. An allowance has been made for this, so that the amount of informal care is reduced for older children.

Formal Childcare Hours

Formal childcare is all childcare which involves a monetary transaction and total hours of formal childcare can be affected by several factors – the duration of time that children spend in childcare, the total number of children who attend formal childcare and the total number of children in the population. However, as the time spent in each type of formal care is assumed to remain constant over the period, the changes actually reflect changes in the uptake of childcare places and the population size.

Chart 1 - UK Child Population

United Kingdom



Source: Office for National Statistics

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(20 Kb)

The number of children in the population will affect some formal childcare places more immediately than others. If the population increases, the number of school places will increase. Provision for the under 5's will be more sensitive to changing preferences, changes in the labour market and/or changes in government policy.

Overall, the number of children in the UK has fallen 4.1% between 1995 and 2010. This is reflected in estimates of formal childcare hours for the UK. Formal childcare per child for children aged 5 to 15 has remained relatively stable, increasing 4.5% over the 15 year period. However, formal childcare per child for children under 5 years old increased substantially, and was 36.4% higher in 2010 than in 1995. Relative to this, population growth has been slower (in 2010, there were just 0.6% more children under 5 years old than in 1995).

Despite a substantial increase in formal childcare of those under 5 years old between 1995 and 2005, on average, children under 5 years old spend much less time in formal care than those 5 to 15 years old.

Table 1: Estimated UK Formal Childcare Hours per Child

United Kingdom

	Hours				
	1995	2000	2005	2010	% change 1995-2010
Under 5	490	621	642	668	36.4
5 - 7	1243	1267	1299	1344	8.0
8 - 10	1214	1237	1256	1268	4.5
11 - 15	1321	1301	1320	1350	2.1
Total	1023	1081	1103	1108	8.3

Table source: Office for National Statistics

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This is in line with government policies in the early 2000's encouraging under 5's into formal childcare. Over the same period, the percentage of mothers in employment also increased ([ONS, Mothers in the Labour Market, 2011](#)).

Informal Childcare Hours**Table 2: Estimated UK Informal Childcare Hours per Child**

United Kingdom

	Hours				
	1995	2000	2005	2010	% change 1995-2010
Under 5	8270	8139	8118	8092	-2.2
5 - 7	7517	7493	7461	7416	-1.3
8 - 10	7546	7523	7504	7492	-0.7
11 - 15	6045	6090	6036	6011	-0.6
Total	7316	7242	7187	7216	-1.4

Table source: Office for National Statistics

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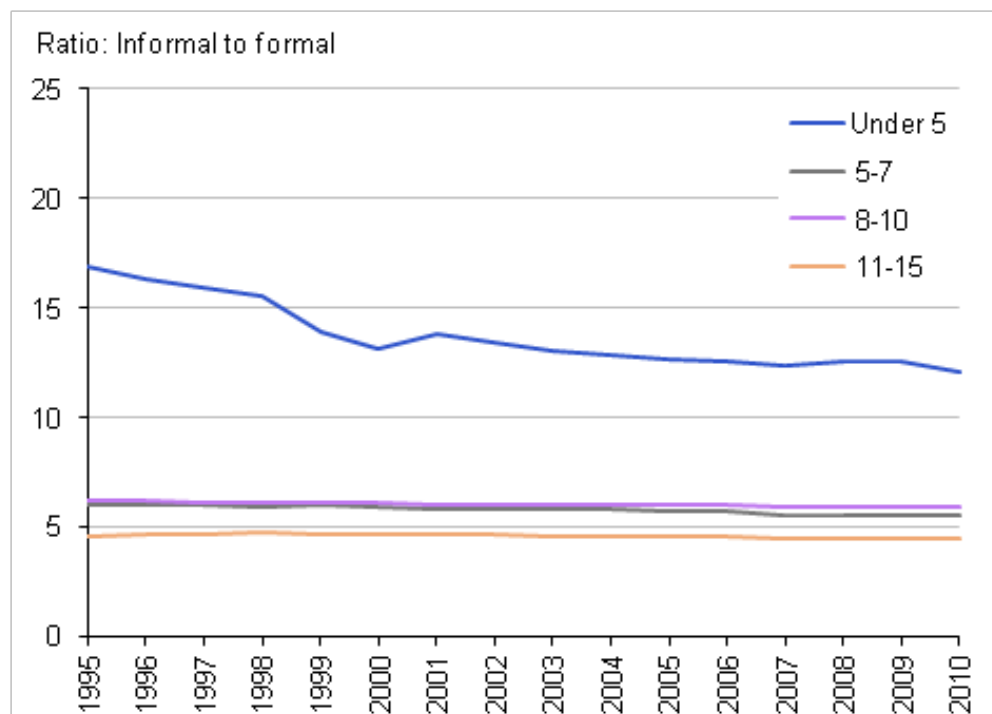
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Reflecting movements in the population and formal childcare, informal childcare hours per child remained relatively stable in the late 1990's before falling. Overall, between 1995 and 2010 there was a fall of 1.4%. This was driven by falls in informal childcare of those under 5 years old, particularly between 1995 and 2005.

Chart 2 looks at the ratio of informal to formal childcare. This shows that in the 10 years between 1995 and 2005, there was a considerable change in the ratio of informal to formal childcare for the under 5's. In 1995, total annual hours of informal childcare was 16.9 times greater than formal childcare. By 2005, this had fallen to 12.7 times greater. Since 2005 the ratio of informal to formal childcare of those aged under 5 has remained more stable and was 12.1 in 2010. By contrast, the ratio for all other age groups has remained relatively stable over the whole period. This highlights the movement away from informal childcare in the home towards formal childcare for children of pre-school age.

Chart 2 - Ratio of Formal to Informal Childcare

United Kingdom



Source: Office for National Statistics

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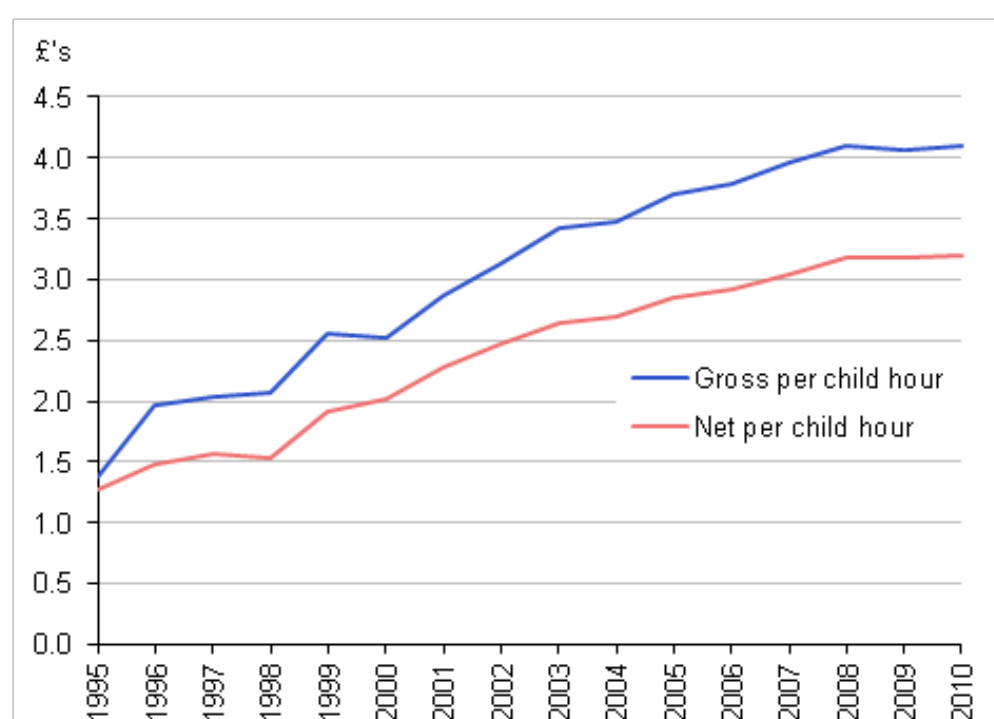
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Value of Informal Childcare

The services provided by a live in nanny have been deemed the closest market equivalent to the services provided by parents and other informal carers, so their rate per child hour has been used to value informal childcare. The wages of live-in nannies have been taken from the Professional Nanny/Nannytax Annual Survey, which gives average wages by geographical area and for the UK.

Chart 3 - Estimated Rate per Child Hour (net and gross)



Source: Office for National Statistics

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(28 Kb)

Chart 3 shows there were sharp increases in average wages between 1995 and 1996, and between 1998 and 1999. While there are likely to be many factors which have contributed to this growth, one of the key influences could have been the introduction of the National Minimum Wage. A shortage of nannies may also have contributed to higher wages. More recently, the wages of nannies have also been affected by the recession, with little growth evident since 2008.

The averages conceal a huge degree of variation, particularly regionally; as such we have used the average wage for 'other cities' (i.e. excluding London) to value informal childcare. Additionally, the wage used to value informal childcare has been adjusted for payments in kind – a nanny is

often paid in accommodation, food and sometime additional perks such as the use of a car. Finally, nannies do not charge for their services by the hour or by the child, therefore we have assumed that on average a nanny works a 48 hour week and looks after an average of 2 children. Obviously, the estimation of the value of informal childcare is sensitive to these adjustments and assumptions.

We consider both gross and net wages. The value using a rate based on gross wages is equivalent to the cost to households were they to employ a nanny to provide the childcare they give. The value based on net wages is the equivalent of what informal carers would receive were they to be paid the same rate as nannies.

Table 3 shows the value of informal childcare using both gross and net wages. It shows that for both methods of valuing informal childcare, the result is a substantial increase between 1995 and 2010. However, these values of informal childcare do not take account of inflation and this rise is against a backdrop of a fall in informal childcare hours. As such we can conclude that the increase in the value of informal childcare is driven by an increase in the price of childcare.

Table 3: Estimated Value of Informal Childcare

United Kingdom

	Billion hours	£bn	
	Informal Hours	Value - Gross	Value - net
1995	88.6	122	113
1996	88.4	174	131
1997	88.5	180	136
1998	88.4	183	139
1999	88.0	225	168
2000	87.5	220	177
2001	85.8	246	196
2002	85.0	266	209
2003	84.3	289	223
2004	83.7	291	225
2005	83.3	308	237
2006	82.9	314	242
2007	82.7	328	251
2008	82.9	340	264
2009	83.3	339	266

2010

83.8

343

268

Table source: Office for National Statistics

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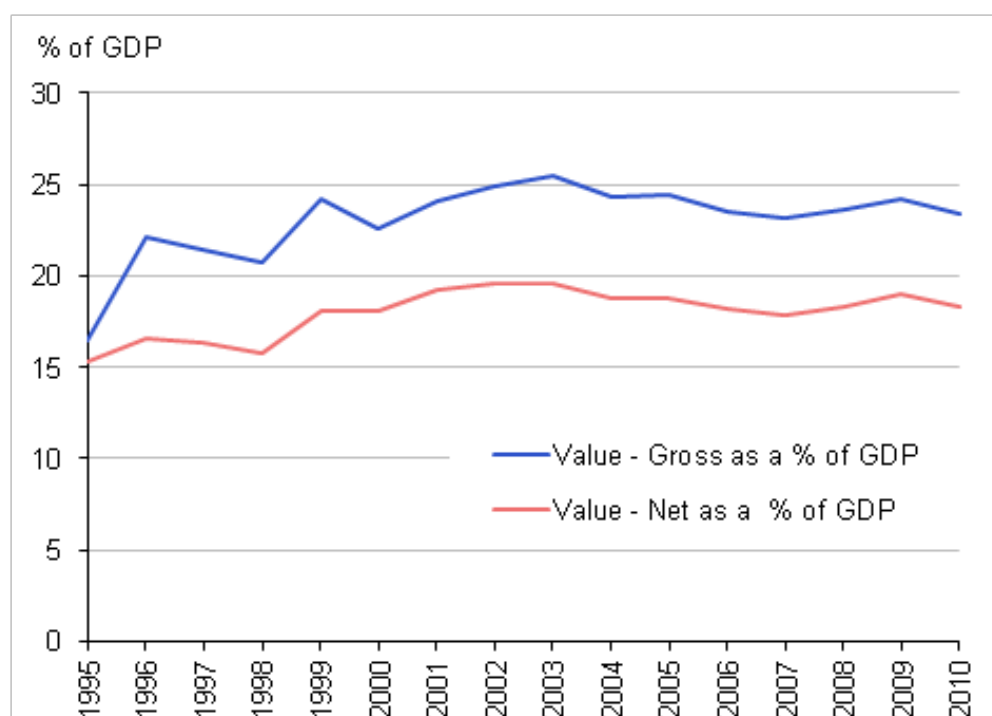
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This can be broken down by age groups, which shows that all age groups experienced an increase in the value of informal childcare and in all cases this was driven by an increase in the price of childcare. In both the 5 to 7 age group and the 8 to 10 age group, this was partially offset by a slight reduction in the number of informal childcare hours.

The valuation of informal childcare is equivalent to either 18% or 23% of GDP (in current prices) in 2010 depending on the rate used. Using gross wages (representing the cost to households were they to employ a nanny to provide the childcare they give) informal childcare is valued at the equivalent of 23% of GDP in 2010, an increase from 16% in 1995. Using net wages (representing what informal carers would receive were they to be paid the same rate as nannies) informal childcare is valued at the equivalent of 18% of GDP in 2010, an increase from 15% in 1995.

Chart 4 shows that between 1995 and 2002 the value of informal childcare as a percentage of GDP increased, reflecting the increases in the value of informal childcare through this period. However, since then informal childcare as a proportion of GDP has fallen slightly again.

Chart 4 - Informal Childcare as a Proportion of GDP



Source: Office for National Statistics

Download chart

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Background notes

1. Details of the policy governing the release of new data are available by visiting www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html or from the Media Relations Office email: media.relations@ons.gsi.gov.uk

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This document is also available on our website at www.ons.gov.uk.

Supporting Information

Further information

[Mothers in the Labour Market](#)

Analysis of the employment trends and characteristics of working mothers, compared to women without children and working fathers.

[About the Household Satellite Account](#)

Further information about the ONS Household Satellite Account (HSA) (experimental)

References

1. [Stiglitz, J. Sen, A. Fitoussi, J.P. \(2009\). Commission on the Measurement of Economic Performance and Social Progress.](#)
2. [Holloway, Short and Tamplin \(2002\). Household Satellite Account \(Experimental\) Methodology. Office for National Statistics.](#)
3. [Office for National Statistics \(2002\). Complete Household Satellite Accounts.](#)

Appendix A: Methodology

Input and Output Methodologies

There are two possibilities for measuring household production, to measure inputs or outputs. Measuring inputs focuses on the time spent on productive activities and relies principally on time-use data. This usually takes the form of a diary, which the survey respondent is asked to complete, giving information about their principal activities throughout a 24-hour period.

The alternative is to attempt to measure outputs, this is the approach being taken by ONS. The output method values what the household produces, for example the number of children cared for or the number of meals prepared. This is important because it is often easier to value outputs than inputs, particularly when there is a market equivalent to the service being produced. Output measurement is also more consistent with the way the rest of the National Accounts are constructed and reflects household productivity. It may be possible to construct a historical series using this approach, even in the absence of time-use data. Outputs can be estimated through surveys that specifically request this type of information.

An estimate of gross unpaid production is obtainable by multiplying the volume of output by an appropriate market value or price. This in itself is problematic due to the difficulties in applying a market price or wage rate to outputs without any information on the variation in quality between households. The methodology is essentially the same for all of the principal functions except voluntary work.

The development of the UK Household Satellite Account was the first attempt to estimate the volume of outputs for each of the principle functions and to produce a value for total household production based on this approach.

Methodology for Childcare

The remainder of this annex will look at the estimation of household production of childcare (one element of the household satellite accounts) using the output approach.

As most of the childcare carried out by the household members or their networks (family members or neighbours) could be delegated to another person, it is deemed to be part of the productive role of households. ONS have not tried to distinguish between physical acts of supervision or help and the building of parent-child relationships, which obviously cannot be delegated.

The HHSA definition of informal childcare is all care which does not involve a monetary transaction. It is the total amount of childcare required (total number of children in the population multiplied by twenty four hours a day) less any formal childcare, defined as all paid childcare, whether it is registered or unregistered. However the estimates do not include some paid care which takes place, but for which ONS has been unable to find any data. This includes care by babysitters and au-pairs, as well as out-of-school clubs and holiday play schemes for children over 8 years old.

As children get older, some of them are left unsupervised for varying amounts of time. An allowance has been made for this, so that the amount of informal care is reduced for older children. There is limited hard data on the actual amount of unsupervised time. If, in fact, the assumptions ONS have

made lead to informal childcare being underestimated (i.e. including too much unsupervised time), this will be offset to some extent by the unmeasured formal care which has not been included.

By using a residual approach to estimate informal childcare ONS is accounting for all the time a child needs supervision. This supervision can be active or passive. Passive care includes the time when an adult may not be directly interacting with the child, but is still responsible for them. The important point is that if no unpaid carer were available, a third person would have to be paid to take their place. Therefore passive care is part of the productive role of households and is included in the estimates.

Estimating Formal Childcare Hours

Information on different types of formal care has been collected for each UK country. This mainly takes the form of the numbers of childcare places available, and in all cases ONS have assumed 100% take-up of places. The requirement for and use of formal childcare varies for children of different ages, so the places have been allocated to the following categories:

- Age Group 1: under 5 years old
- Age Group 2: 5 to 7 years old
- Age Group 3: 8 to 10 years old
- Age Group 4: 11 to 15 years old

As formal childcare availability varies by the time of the year, the year has been split into four types of day:

- Weekend = 104 days
- Week Day School Day = 180 days (36 weeks x 5 days)
- Week Day Working Holiday = 28 days (4 weeks x 5 days plus 8 bank holidays)
- Week Day School Holiday = 53 days (12 weeks holiday minus bank holidays)

The estimates for each age group, by time and type of day, have been aggregated to obtain a figure for the total number of hours spent by all children in the UK in formal care in any one year.

As for the original estimates produced in 2002, for each separate type of day and age group, assumptions were made about the length of time the various types of childcare provision were available. ONS continue to review the assumptions and would welcome any information on further sources to inform this process. Although the length of time the various types of childcare provision is available may change over time, the HNSA assumes this to be constant. Full details of the assumptions made about each type of formal care can be found in appendix B.

ONS assume those children in foster places and children's homes are cared for 24 hours a day all year round, with the exception of attending school for 6.5 hours a day. Similarly, full time boarders are assumed to be in formal care 24 hours a day on school days and at weekends. Weekly boarders are assumed to be in formal care 24 hours a day on weekdays in term time. This means that for some individual children ONS may be double counting the total number of hours spent in formal care; for example, a foster child, a child living in a children's home or a boarder may attend other formal care activities (such as holiday play schemes or out of school clubs). Due to this double counting, the total number of formal hours may be slightly over estimated; this will result in an underestimate of informal hours.

Assumptions have also been made in order to divide the geographic data between the three different age groups. If the data is already broken down into different age groups from the ones outlined above, then the data is prorated using the UK country and year specific population age structure. If only the total number of children in a care category is available, then the proportion in each age group from the England data has been applied to the total numbers. Finally, if data is split down into the age groups for only some years, then the average split between the age groups has been applied to the years when only the total is available. Missing data points have been estimated by predicting the trend between existing data points.

To ensure a consistent approach across all four countries of the UK the population estimates were taken before any adjustments for the 2011 Census had taken place. Therefore at this stage the population estimates are not consistent with the 2011 Census.

Estimating Informal Childcare Hours

ONS estimate the volume of informal care by subtracting the hours spent in formal care, plus an allowance for the hours a child aged 12 to 15 may be left unsupervised, from the child population multiplied by the total number of hours in a year. As with formal care, the total hours of informal care can be broken down by age group and time, and type of day.

The assumption about the time children aged between 11 and 15 spend unsupervised is critical in calculating informal hours, and is perhaps the most difficult to support with hard evidence. To estimate the number of hours spent in informal care, the number of hours a child is left unsupervised, plus the hours spent in formal childcare activities, needs to be subtracted from the total population hours. This time unsupervised by adults could be when a child is spending time with their friends, being looked after by an older sibling, or when they are on their own.

The data available for when children are left unsupervised by their parents is very sensitive to reporting errors. This is due to social norms and beliefs about the amount of time children should spend alone. A survey carried out by Kids Club Network in 1997, sponsored by Nestlé, estimated that 6% of children return home to an empty house. A similar survey (the Make Space Youth Review) conducted by 4Children in 2007 suggests that an estimated 34% of all teenagers return home to an empty house. The sensitivity of the issues suggests that there is under-reporting by parents. Because of the lack of data about the length of time left unsupervised, ONS have started from the working assumption outlined below.

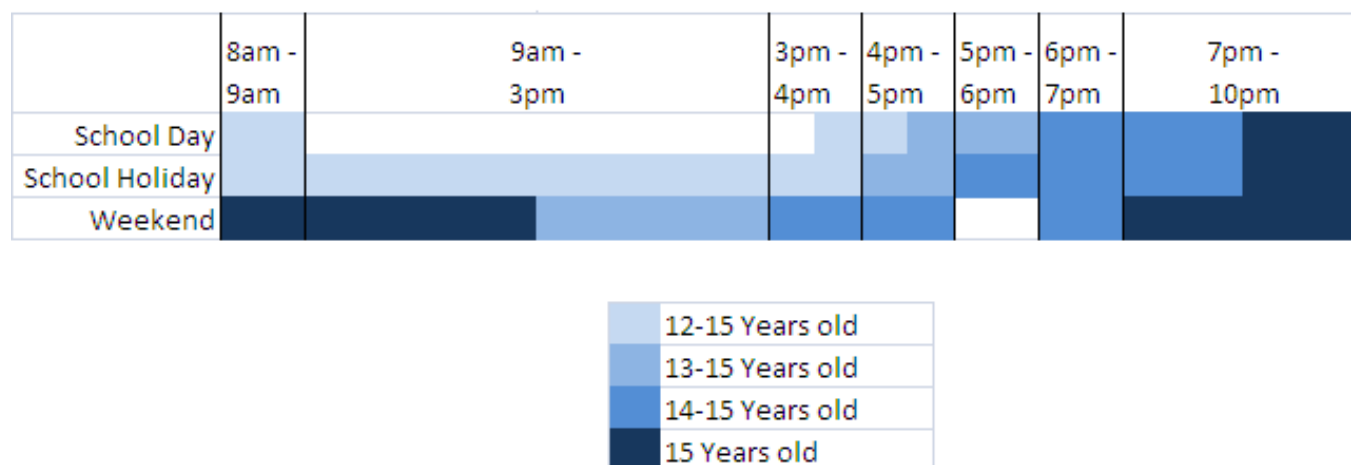
In the HHSA ONS have assumed that no child aged 11 or under is left unsupervised and that 10% of 12 year olds, 20% of 13 year olds, 30% of 14 year olds and 50% of 15 year olds spend time without adult supervision. In every case, ONS have not included any allowance for time spent unsupervised during four weeks holiday plus Bank Holidays. These assumptions can be interpreted as a mix of two extremes. ONS could say that 10% of children aged 12 are left unsupervised all the time. ONS could also say that out of 337 days (365 days minus four weeks paid holiday of parent/carer minus eight days bank holiday) an individual 12-year-old would spend a total of 10% of their time unsupervised.

As the unsupervised time figure shows, for a 12 year old, this unsupervised time could typically include an hour in the morning before school, plus an hour and a half after school (e.g. walking themselves to and from school), plus being left unsupervised by an adult between 8.00 a.m. and 4.00 p.m. in the school holidays while a parent is at work. This scenario assumes no time

unsupervised in the evenings or at the weekends. For a 15-year old, the assumption includes the same times of day as a 12 year old, plus additional hours after school on school days, in the evenings in the school holidays and at the weekend. Informal care in the HHSA is therefore care of children by adults, as care of children by other children is included in the assumption of time unsupervised.

Unsupervised time

Unsupervised Time



Valuation of Informal Childcare

As mentioned earlier the requirement for and use of informal childcare varies for children of different ages, as well as by different times of the day and different days of the year. It is possible to value all informal hours at a single market price or to take into consideration the time of the year, time of the day and the age of the child. Because ONS is valuing the output of childcare, i.e. the number of children cared for multiplied by the total time in a year when they receive this care; the market price must also be a rate per child.

The services provided by an employed live-in nanny are deemed to be the nearest market equivalent to the services provided by parents and other informal carers, so their rate per child hour has been used to value informal care. The wages of live-in nannies have been taken from the Professional Nanny/Nannytax Annual Survey, which gives average wages by geographical area for the UK.

However, the averages conceal considerable variation. For example, the Nannytax survey shows that for live out nannies in 2010, the net weekly wages was £490 in London, but just £360 outside of London and the Home Counties. ONS have used the average wage for other cities. i.e. excluding London.

A live-in nanny is paid not just in wages but also in accommodation and food, with some nannies receiving additional perks such as the use of a car. Because of this the live-in nanny wage rate is lower than the daily nanny rate. The Nannytax survey gives data for both live in nannies and live out nannies, with a difference of £110 per week in net wages in central London in 2010.

ONS have made an adjustment for payment in kind, comparing the live-in and daily rate for nannies working the same number of hours per week. This results in an upward adjustment to the net wage rate of 8.5% and the gross wage rate of 10%.

Nannies do not charge for their services by the hour or per child. ONS have assumed that the average live-in nanny works 48 hours a week looking after an average of two children. This information is used to adjust the gross and net weekly wages.

Further Areas for Development

There are several ongoing methodological challenges which ONS will continue to develop while updating the accounts. Of primary concern is the use of the 'time-unsupervised' assumption; this assumption could be tested by examining whole household data in the 2000 Time Use Survey and estimating time spent unsupervised by age. Additionally, the alternatives for pricing passive care will be investigated.

ONS acknowledge the advantages of using time-use data to complement the output approach. The main advantage of using time-use data is that socio-demographic information can be applied to the data to answer questions such as 'who is providing informal childcare?'. The data sources used in the UK accounts, at present, do not allow linkages to be made between the outputs of household production and types of individual. This question can be addressed by looking at time-use data, such as the UK Time Use Survey from 2000, allowing the comparison of relative contributions of different socio-demographic groups.

It is also possible to make assumptions about the amount of time children of different age groups are asleep, and therefore the childcare is passive rather than active. By splitting informal care into passive and active care, different prices can be applied reflecting the different valuation of passive and active care.

Appendix B: Data Sources

Household Satellite Accounts - Valuing Informal Childcare in the UK uses a vast array of data sources. Full details of the data sources used and assumptions made can be found in the [reference table \(55.5 Kb Excel sheet\)](#) accompanying this appendix.

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