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Analytical evidence on the 'cost of a
child'

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This report was commissioned by the Scottish Government and produced by the Fraser of Allander Institute (FAI) and the Centre for Excellence for Looked After Children in Scotland (CELCIS). The technical analysis was carried out by FAI, and any technical errors or omissions are those of the FAI.

FAI & CELCIS

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Executive Summary

- The Scottish Government are working with the National Review of Care Allowances Group on a new national allowance for foster and kinship carers.
- To inform these discussions the Fraser of Allander Institute (FAI) and the Centre for Excellence for Looked After Children in Scotland (CELCIS) were commissioned to provide analytical evidence on the cost of looking after a child in Scotland.
- There are a number of methodologies available to do this. This report uses one of these methodologies, as agreed by the National Review of Care Allowances Group. This methodology examines the additional cost incurred by otherwise identical households with differing numbers of children while maintaining the same standard of living between these households. This involves estimating two statistical models linking household income and consumption (as detailed in the technical appendix).
- We present estimates based on a comparison of households with one child of a given age to an otherwise equivalent but childless household. We also produce estimates based on a comparison of a two-child household with a one-child household, thus focussing on the cost of this additional child. Additional costs incurred in looking after a first child mean that the estimated cost of a child based on that child being the 'first child' are higher than those of an 'additional' (in this case, second) child.
- In both cases, we find that the cost of a child generally increases as the child ages, with the lowest cost estimates being for 0 – 4 year olds. We discuss the sensitivity of the results to the underlying data in a technical appendix.
- For a 2 adult household we find that the cost of the first 0—4 year old child in a household is £114 a week (and £82 per week for an additional 0—4 year old). The additional cost for the first 5—15 year old child is £140 per week (and for an additional 5—15 year old is £100 a week). For 16 – 17 year olds, the additional cost is £159 a week for the first child (and £120 per week for an additional child).
- It is intended that this research will feed in to a wider evidence base and subsequent discussions about a national care allowance rate in Scotland to enable a decision to be made on setting a national foster and kinship carers allowance for Scotland.

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1. Introduction

The Scottish Government commissioned the FAI & CELCIS to undertake research and data analysis to assess the 'cost of a child'. This will inform discussions about a national minimum allowance for carers and provide an analytical understanding of the cost incurred in caring for a child in Scotland.

This report is intended to provide the Scottish Government with a robust framework to compile estimates of the cost of raising a child for a range of household structures and incomes throughout different stages of the child's life. Specifically, we have been asked to consider different household structures and income levels. It is intended that this report will provide a benchmark on-top of which additional research on the costs of looked after children will be added.

This work has been undertaken using a methodology which is broadly comparable to that previously used to provide estimates of the cost of a child for Wales (Welsh Government, 2010) and previous research undertaken for Australia (Australian Government, 2005). The methodological approach was selected by the Scottish Government, but the practical implementation of this approach was undertaken by the FAI.

It is important to make clear that this approach does not estimate the costs incurred by households to meet the needs of a child through pricing a particular basket of goods. This approach has been undertaken previously in other contexts, but was not the within the scope of this work. Instead, the methodology here seeks to establish the additional consumption expenditure required by a household with one more child to achieve the same standard of living as a household identical in all respects except that it contains one fewer child of a given age. These expenditure equivalences are presented for different household structures and income levels.

The report is structured as follows. Section 2 presents the background and context to this study, section 3 outlines the data and statistical approach used in this report, section 4 presents the results, and section 5 concludes. Appendix A provides a more technical overview of this work alongside full model results and robustness checks.

2. Background

This study represents a further step in the development of national minimum allowance rates for caring for children in foster care or kinship care across Scotland. Rights to human dignity are central to the [United Nations Convention on the Rights of the Child](#) (UNCRC, 1989), and children in Scotland have told us about the things they need to be happy, safe and healthy throughout their lives, and to live with dignity (Children’s Parliament, 2018). In accordance with the underpinning concepts of corporate parenting, Scottish Government (2010) statutory guidance makes explicit the expectation that care provided to looked after children and young people should be of optimum quality, and reflect the standards of care children would receive from a concerned parent. This specifically includes (Scottish Government, 2010: 121):

- a healthy diet and good physical care;
- opportunities for stimulation and exercise;
- development of social skills and participation in activities in the community;
- building self-esteem, including good presentation and acceptability by peers;
- a safe and comfortable environment;
- full inclusion in special celebrations such as birthdays, Christmas or other cultural or religious events and promoting and developing educational opportunities.

Thus, allowances are financial payments made to carers, by local authorities or independent fostering agencies, to recognise and meet the costs of caring for a looked after child.

In response to the recommendations of the National Foster Care Review (2013) the Scottish Government published research in 2014 on the potential methodologies available for calculating allowances for foster carers (Scottish Government, 2014). Subsequent development was informed by a legal challenge, from the Equality and Human Rights Commission against Scottish local authorities, concerning the need for parity in allowance rates for children living in kinship and foster care. In 2015 the Scottish Government accepted this child-rights based position, and allocated additional funds to local authorities in order to facilitate an uplift of kinship allowances to the rates provided to foster carers locally. The

2017/18 Programme for Government contained a commitment to review foster, kinship and adoption allowances, bringing forward proposals for national kinship care and foster care allowances.

Allowances also exist to ensure that carers are not out-of-pocket for providing care for a child on behalf of local authorities; they are not a reimbursement for the carer's time (which is met separately, where appropriate for foster carers, through a 'fee' payment). Current national guidance states that:

“Fostering allowances should ensure that children are offered high quality physical care and provision, and also that they have the opportunities to fill some of the gaps in experience that are often found in looked after children. Within the fostering household, children should not experience any sense of disadvantage, nor should the lifestyle of the foster family be financially disadvantaged by the placement.” (Scottish Government, 2011: 121)

At present the rate of the allowance provided to foster carers and kinship carers is determined by individual local authorities and independent fostering agencies, in line with Regulation 33 (i.e. taking account of the child's needs and the circumstances of the carer) of the Looked After Children (Scotland) Regulations 2009. Although Scottish Ministers took powers to set allowance rates under Regulation 110 of the Adoption and Children (Scotland) Act 2007, there is currently no national statutory guidance on the amount that is to be paid to carers, or thresholds indicating a minimum or maximum payment to meet the costs of caring for a looked after child.

In respect of allowances for foster carers, the absence of a nationally prescribed rate puts Scotland at odds with the rest of the UK's administrative areas (Scottish Government, 2014:5). Since July 2006 the Department of Education has set 'national minimum allowances' for foster carers in England (DfE, 2018). These 'minimum' weekly payment rates - for the Department is clear that it expects carers to be awarded further allowances to meet individual children's needs above it – were introduced to provide a safeguard against egregious and persistent underestimates of the cost of caring for a child. They apply to all approved foster carers and are up-rated annually in line with inflation. It is worth noting that these rates apply to related and unrelated (family and friends) foster carers.¹ The method on which they are based

¹ In Scotland, friends and family carers are assessed and categorised as 'kinship carers', not foster carers.

incorporates two elements: first, calculating the cost of caring for a birth child; second, calculating the additional cost of caring for a foster child. In relation to the first element, the English rates use an ‘actual expenditure’ approach, based on survey research of family spending.

In Northern Ireland, fostering agencies are subject to a statutory ‘model scheme’ of allowances (DHSSPS, 2018). This does not set minimums, but rather ‘standard’ rates. The rates of allowances are broadly consistent with the minimums set for England (out with London and the Southeast) but there is one less age band, with no differentiation between ‘babies’ and ‘pre-primary’. In light of these being standard rates, the official guidance on their distribution and allocation is much more prescriptive than the English version. The rates apply to all approved foster carers, and are updated annually by the Northern Irish Executive’s Department for Health, Social Services and Public Safety, in consultation with the Health and Social Care Boards (who are responsible for looked after children).

The Welsh Assembly Government is the most recent UK authority to introduce statutory guidance on national minimum allowances for foster carers, with the first rates coming into effect from 1 April 2011. Agreement on the policy was delayed following an inconclusive consultation in 2006-07. Further research was then undertaken by the Welsh Assembly Government, which recommended that statutory ‘minimum rates’ (as in England) be set for all fostering agencies operating in Wales.² The rates set in Wales are broadly consistent with those set in England and Northern Ireland, but are restricted to three age ranges (instead of the four in the Northern Irish scheme and 5 in the English). Moreover, unlike the annually updated English and Northern Irish schemes, the Welsh rates are only reviewed and updated every three years. Part of the method used to calculate the Welsh minimum fostering allowance, utilising the UK’s Expenditure and Food Survey to identify ‘actual expenditure’ on a child in a family, is explored in more detail throughout this report.

The additional component of the Welsh, English and Northern Irish allowance calculations, required further research to estimate the specific costs associated with caring for a looked after child, are not considered here. In previous reports and studies, stemming from the work of Oldfield (1997), it was noted that the costs involved in caring for a looked after child are a multiple of those costs incurred by families caring for their own children. Oldfield (1997) estimated that the range of 32% and 62%. Other UK Governments have taken this on board

² Welsh Assembly Government Circular 005/2011 (February 2011) National Minimum Maintenance Allowances for Foster Carers 2011-14

as an average of 50% uplift required; for example, the Welsh Government (2010) opted for a 50% uplift to reflect these additional costs when setting carers allowances.

3. Methodology and data

The objective of this exercise was to establish the difference in consumption expenditure between households that were identical except with respect to the number of children of a particular age in the household.

We do this using a series of regression models alongside data from the Living Costs and Food (LCF) survey. The way this works is as follows, illustrated with an example.

- We calculate the average consumption level for a particular household with one child of a particular age, and the share of their household expenditure that they spend on a given 'essential' basket of goods.
- We then work out the difference in consumption expenditure between this household and an identical household with one fewer child in order that both households had the same standard of living. We do the same in comparing a household with two children of a given age with one with only one child of that age.
- It is worth reiterating that the methodology used here is designed to capture the *additional* expenditure incurred by a household with one more child than an otherwise identical household does, in order to achieve the same standard of living. This standard of living is taken to be both households having the same share of their total expenditure being spent on a given basket of basic goods.

Of course there will be differences in our estimates depending upon the number of children being looked at (both for technical sampling reasons and possible economies of scale).

There are of course other approaches to determining the 'cost of a child', but this one approach enables the production of consumption equivalence measures utilising nationally representative survey data. It does so taking account of actual consumption decisions by households of different characteristics, reflecting how households allocate their consumption.

The data used in this piece of research were from the LCF survey. This is a nationally representative survey of family expenditure, and forms one of the primary inputs into the construction of measures of the consumer price index. The survey captures information on household composition and demographics, alongside detailed information on what households

spend money on and how much money they spend on a very detailed number of goods and services. It is not longitudinal in nature, in that it does not follow the same households over time, however it has been running in its present form for just over a decade, having previously been known as the Expenditure and Food Survey. The LCF is a voluntary survey of private households in the UK which is designed to provide detailed information on household expenditure patterns and food consumption. Each year nearly 12,000 households are selected for participation in the survey. In the most recent year of available data, nearly 5,000 of these households fully co-operated in completing the survey.

We were unable to rely solely on data on Scottish households in this survey due to the limited sample size of Scottish households in the survey (e.g. 360 households in Scotland were contained in the latest data release covering 2016/17). In order to focus on a more reliable survey sample we augmented our information on Scottish households with records for households in the rest of the UK. In addition, we combined four waves of survey data covering the years 2013 to 2017—suitably adjusted for inflation- to provide a large enough sample size for this analysis.

The information taken from the survey for the purposes of this work included information on the household income, expenditure, demographic characteristics, economic activity, etc. We did not have access to information on the number of children of each age (in years) in each household. Instead, we had information on the number of children in the household in a small number of age ranges. This meant that we worked with the three age ranges 0-4; 5-15; and 16-17.

Given our focus in this study, and the desire as outlined earlier to “*capture expenditure patterns that are relevant to the general populace*” of carers, we narrowed the sample of included households from the population provided in the LCF survey as outlined in the scope of the tender in the following way.

First, pensioner households and wealthy households were excluded. This was done using the LCF survey definitions. Second, households in London were excluded in line with the earlier study for Wales, given the very different nature of expenditure for households living in London. Third, the LCF survey includes a small number of households with very low (indeed in some cases zero) incomes. In order to ensure that the expenditure patterns captured were relevant to the general population of carers, households with weekly incomes less than £25, or greater than £1,600, were excluded from this analysis. This, as with any change in the dataset, has some impact on the point estimates produced when the sample is segmented by income

quintile. All expenditure was converted into 2017 prices using consumer price index (CPI) data, and income data was converted using data on average weekly earnings (AWE).

In order to implement the methodology outlined above, we were required to define the nature of the 'basic good' bundle which we use to identify households with an equivalent standard of living. In order to do this, we reviewed existing studies, in particular the one undertaken for Wales using an earlier version of the same dataset that we used. This was also broadly consistent with the earlier Australian study. This defined the basic good bundle as comprising:

- Food at home
- Fuel and power;
- Household non-durables for use inside the home (e.g., disposable nappies);
- Postal, telephone and telegram charges (not broadband); and
- Personal care products and services (e.g., shampoo).

In addition, in discussions with Scottish Government officials, it was agreed that broadband expenditure would be included into this basic good bundle for the purposes of this study. Furthermore, following a discussion with Scottish Government colleagues results for other basic good bundles were produced (see technical appendix).

Of course, as with any empirical exercise, we need to examine in detail the robustness of our conclusions to a range of factors that might produce different model estimates. We benchmark our estimates against a) those derived from applying the same modelling approach to at least one additional previous year of survey data and b) against those produced for Wales using the same methodology. Full results alongside sensitivity/robustness checks are provided in Appendix A.

This work builds on a body of work in this area deriving expenditure equivalence measures. There have been some criticisms of this kind of approach, with some arguing for an alternative approach based more around an understanding of the direct expenditure incurred to meet the needs of a child. This has been the subject of more recent work in Australia (Australian Government, 2005). The alternative approach outlined in this other work is outside of the scope of this research, although this could be the subject of some follow up analysis.

Before discussing our results in detail in the next section, a few issues are worth highlighting. First, the approach taken here is to divide the whole sample of households into five groups. Thus, these results are not based on quintiles for the entire population of households based on their incomes. We have, for example and as discussed in Section 3, already removed pensioner and very wealthy households. Thus, the characteristics of this sample may differ from other sources that provide information on the population by income quintile.

By narrowing our sample further what we arrive at as estimates of the cost of an additional child for a particular income quintile may change. We have opted to drop only those households from our sample that have an exceptionally low income (less than £25 a week) or a very high income. A higher (or indeed lower) minimum income threshold could be set which would have the effect of reducing (increasing) the sample size, but also increasing (decreasing) the average income of the lowest quintile group.

Second, in splitting up the sample in this way, we are reducing the sample size for each model by 4/5ths. This has implications for our ability, using these models, to obtain our estimates of the cost of an additional child. Relatedly, this means that the top and bottom quintiles may be characterised by particularly high and particularly low income levels respectively, with implications for the cost of an additional child in each of these quintiles. We illustrate in the appendix the effect that adding an additional year of data to the analysis has on our estimates.

Table 1: Quintile descriptive statistics

Number of adults	Quintile	Mean weekly gross income	Annual gross income equivalent	Number of households
1 adult (1A)	1	£131	£6,829	1,041
	2	£239	£12,447	1,048
	3	£340	£17,661	1,071
	4	£474	£24,657	1,082
	5	£804	£41,793	1,073
2 adults (2A)	1	£336	£17,464	1,788
	2	£552	£28,690	1,847
	3	£733	£38,131	1,799
	4	£953	£49,573	1,755
	5	£1,305	£67,839	1,762

Third, a decision is needed about which quintile to focus on for policy. Previous work for Wales focussed on quintile 2 for one adult households and quintile 1 for 2 adult households. This was justified on the basis that “mean weekly gross income in this quintile (the lowest quintile) (£361 *[in 2009-10 prices]*) is equivalent to, or higher than, the relative poverty thresholds as defined by the UK Government (60% of the median income)” (Welsh Government, 2010, 4). We take a very similar approach in this report, using estimates of the minimum income required for a decent standard of living provided by the Joseph Rowntree Foundation (JRF). In December 2017 JRF defined this to be £401 a week for a couple with two children aged between 5 and 14 and £297 a week for single parent with two children aged between 5 and 14 (Joseph Rowntree Foundation, 2017:12) .

From Table 1 we can see that this puts a two adult household between quintiles 1 & 2 in our sample, and a one-person household between quintiles 2 and 3. On this basis, our results for quintile 2 are perhaps those most relevant for 2 adult households and quintile 3 results most relevant for one adult households. The alternative would be to take the quintile that is one lower for both household types (these would match up to the same quintiles considered in the Welsh study). However this would not be consistent with the approach taken in Welsh Government (2010) which focuses on the quintile which has its average income “equivalent to, or higher than, the relative poverty thresholds” (Welsh Government, 2010:4). The results for quintile 2 for two adult households and quintile 3 for one adult households are presented in the main body of the report, and the full quintile results are presented in Table B2 & B3 in Appendix A. Some foster carers will already have an income above this level, and may therefore consider that a higher income threshold is needed to meet their needs. This is of course an option open to policymakers.

Results

In this section we present the results from implementing the methodology outlined in the previous section with the data discussed in that same section. We estimate the additional cost of a child for households in each income quintile to arrive at a central estimate of the additional cost of a child. As we have discussed, we select which quintiles to focus on by bringing in external evidence from the JRF on the income required for a decent standard of living. As a result, we focus discussion in the main part of this report on a subset of our results, but we provide more detailed results in Appendix A, including the results for each quintile and the comparison of these results to different specifications.

It is worth reiterating that what the results in this section are designed to capture is the additional expenditure incurred by a household with one more child than an otherwise identical household, in order to achieve the same standard of living. This standard of living is represented by having the same share of their total expenditure being spent on a given basket of goods (BG).

We focus in the main body of the report on one bundle of goods, but in the appendix, we consider five other baskets of goods. We also provide a comparison to the national minimum foster care allowance rates paid in England, Wales and Northern Ireland. However, the published rates, consistent with Oldfield (1997) as discussed earlier, include a 50% uplift in the cost of a child. For comparability, all figures in this section, so both Table 2 and Table 3, present estimates of which do not include this additional 50% uplift.

Central results and comparisons

Table 2 presents the results of this analysis for quintile 3 for one adult households and quintile 2 for two adult households for a first child, and an additional (second) child. Our estimates suggest that the cost of an additional 0 – 4 year old is lower than for older children. Taking the central case of quintile 2 for a two adult household, we can see that the cost of a first child of that age is estimated to be £114 and an additional child of that age to be £82. To reiterate, these estimates do not include an uplift in line with Oldfield (1997), which has been interpreted elsewhere, for example in Wales, to require a 50% increase in these numbers to arrive at the foster care allowances which are paid. The equivalent estimates for the first 5 – 15 year old child in the household are £140 and an additional child of that age in the household is estimated to be £100. Likewise adding a 16-17 year old child to a two adult childless household is

estimated to cost an additional £159 a week, whereas adding an additional child of that age to that household is estimated to cost an additional £120.

Table 2: Comparison of estimates of the cost of a child

	Cost of first child			Cost of second child		
	0 - 4	5-15	16 - 17	0 - 4	5-15	16 - 17
2 Adult HH	114	140	159	82	100	120
1 Adult HH	102	116	183	82	83	140

Having set out the central estimates of the cost of an additional child derived using the method outlined in the previous section; we now compare these results to the existing allowance rates paid in England³, Wales⁴ and Northern Ireland⁵. England has a separate national minimum rate for 5 – 10 year olds and 11 – 15 year olds, so for simplicity we base the rate in Table 3 on the highest of these values. Similarly, England has a separate national foster care allowance for babies and for pre-primary age children. For simplicity, we only report the upper figure in Table 3.

Table 3 provides an overview of the cost of a child estimated in our central case, our alternative case, and compares these to the headline foster care allowance rates for England, Wales and Northern Ireland. We can see that our estimates of the cost of adding a child aged 0 – 4 year old into a childless household are very close to those in Wales, while our estimates of adding a 5 – 15 year old or 16 – 17 year old to an otherwise childless household are much higher. In contrast, our estimate of the cost of adding an additional 0 – 4 year old child to a two adult household are lower than those in Wales, while our estimates of the cost of adding an additional (second) 5 – 15 or 16 – 17 year old to that household are comparable to the rate in Wales, England and Northern Ireland.

It is important to emphasise that the results presented here are sensitive to some changes in the estimation. The general pattern across quintiles and ages of children remains, but adding

³ <https://www.gov.uk/foster-carers/help-with-the-cost-of-fostering>

⁴ <https://www.thefosteringnetwork.org.uk/sites/www.fostering.net/files/content/welshgovernmentallowances2017-2020.pdf>

⁵ <https://www.nidirect.gov.uk/articles/training-and-financial-support-fosterkinship-foster-carers>

more data or taking some data away will change the point estimates produced. This is particular the case for estimates for poorer households in the bottom quintile. Across all quintiles and baskets of goods, estimates of the cost of a child will change as we add or remove data from our sample. For example, expanding the dataset to include data for 2012 changes particular quintile results by up to £29.

Table 3: Comparison of central estimates of the cost of a child (excluding 50% uplift)

	0-4	5-15	16-17
First child⁶	114	140	159
Second child	82	100	120
<i>England</i>	85	107	125
<i>Wales</i>	113	103	129
<i>Northern Ireland</i>	83	98	122

⁶ Following the Welsh study, these rates are based on the cost of a child in a two adult household.

Conclusions

This report has provided analytical evidence on the cost of looking after a child in Scotland that will feed into the discussion of the National Review of Care Allowances Group about a national care allowance for Scotland.

There are different methodologies to assess the cost of looking after a child in Scotland, which may produce different estimates. It is important to reiterate that we are not seeking to price up the cost of providing a basket of goods necessary to care for a child. Instead, the approach in this report focuses on the additional consumption expenditure incurred by a household with one more child to achieve the same standard of living as a household identical in all respects except that it contains one fewer child of a given age.

We have illustrated these expenditure equivalences for different household structures and income levels. In the main body of the report, we presented estimates based on a comparison of households with one child of a given age to an otherwise equivalent but childless household. We also produced estimates based on a comparison of a two-child household with a one-child household, thus focussing on the cost of this *additional* child. Households incur various expenditures in relation to a first child, which they do not then re-incur in relation to a second child. Thus the estimated cost of a child based on that child being the 'first child' are higher than those of an 'additional' (in this case, second) child.

In the appendix, we also compare estimates across a range of different definitions of basic good bundles. We also explored the sensitivity of these results to the underlying sample that used by adding in an additional year of data. These results are contained in the technical appendix at the end of this report. This shows that the point estimates produced using this methodology can be sensitive to the underlying sample, but that the general pattern across quintiles and definitions of basic good bundles remains.

The results contained in this report will help inform an important debate underway around setting a national allowance for foster and kinship carers.

4. Appendix A – technical appendix

The purpose of this appendix is twofold. First, we will discuss the methodology in more detail, and second we will present the full model results alongside some additional robustness checks. The aim being to illustrate the degree to which the model results are sensitive to particular assumptions that made in the modelling.

Further technical detail on the methodology

The method for assessing the cost of a child used in this report follows an established method provided to us having been agreed by the National Review of Care Allowances Group. The specification for this work provided the following guidance. We were asked to use an ‘Expenditure Survey’ approach, which is the approach detailed in this technical appendix and summarised earlier in this report. We were also instructed that our estimates were not to include any estimate of the earnings foregone in caring for children, or other indirect costs. We were asked to compare similar households, and to exclude from our sample households with spending patterns ‘substantially different from those of working households with income constraints’.

This was interpreted to mean excluding pensioner households (as defined in the LCF survey) and excluding very wealthy households (as defined in the LCF survey, or with weekly household incomes over £1600), and households with exceptionally low incomes (less than £25 a week). We further excluded households in London from our analysis in line with previous research (Welsh Government, 2010). We also considered a range of different basket of goods, which are used to estimate standards of living for the purposes of this approach.

Following a discussion on the role of transportation, clothing and childcare costs, we undertook to present results based on six definitions of a ‘basic good’ bundle.

These basic good bundles are:

- BG1 – Food at home; Fuel and power; Household non-durables; Postal, telephone, internet; Person care products and services

- BG2 – BG1 plus transportation costs (not including season tickets)
- BG3 – BG1 plus children’s clothing costs
- BG4 – BG1 plus transportation costs (not including season tickets) and children’s clothing costs
- BG5 – BG1 plus childcare costs
- BG6 – BG4 plus children’s clothing costs

The variables used to define each of these basic good bundles, alongside more detailed descriptions of these variables are contained in Table B1 below.

Table B1: LCF survey variables used to define basic good bundles

Item	Detailed description	LCF Code
Food at home	Total food and non-alcoholic beverages	P601t
Fuel and power	Fuel, light and power (rebates included)	P537t
Household non-durables	Toiletries (disposables), inc. toilet paper, toiletries, soap, hair products, cosmetic and related accessories, baby toiletries and accessories.	CC1311t
		CC1312t
		CC1317t
Postal, telephone and internet charges	Postage and poundage	C81111t
	Telephone household share of account	B1661
	Mobile telephone account	B1661
	Internet	B195
Personal care	Bar of soap, liquid soap, shower gel etc	CC1313t
	Toilet requisites (durables - razors, hairbrushes, etc)	CC1314t
	Hair products	CC1315t
	Cosmetics and related accessories	CC1316t
Transport	Bus and coach fares other than season tickets	C73212t
	Railway and tube fares other than season tickets	C73112t
	School travel	C73513t
	Petrol	C72211t
Childcare	Nursery, creche, playschools	CC4121t
	Child care payments	CC4122t
Children's clothing	ONS clothing and footwear (children)	P541c

We now outline the ‘Expenditure Survey’ approach in more detail. In following the established literature, we estimated the following two regression models.

Equation 1: $C = f(fY, fY2, Age_i \dots Age_n, \text{demographic controls})$

Here C is household consumption expenditure, Y is total household weekly income, and Age_i controls for the age composition of the household. In addition, demographic controls were added to this model. These related to the sex of the household representative person, their level of education, ethnicity, marital status and economic activity.

$$\text{Equation 2: } \text{LNPF} = g(\text{LEFS}, \text{LEFS2}, \text{LNF}, \text{CKA}_1, \dots, \text{CKA}_n, \text{demographic controls})$$

Here LNPF is the log of the proportion of household consumption expenditure spent on the selected basic goods; LEFS is log per capita consumption, LNF is the log of family size and CKA_i is the share of the household of that age range. The same demographic controls were added to this model as were added to model 1.

This was operationalised in the following way, explained with an example:

- › We started with a particular household specification, Household 'A' (2 adults and 1 child⁷) and using output from a linear regression of Equation 1 we estimated the expected consumption level ' C_A ' for that household.
- › We then took Household 'A's' characteristics, including the estimated consumption level estimated using Equation 1, and used Equation 2 to estimate the average share of consumption that that household would be expected to spend on a specified 'basic good' bundle.
- › This is taken as a measure of standard of living for Household 'A'. We then use this as the target 'standard of living' for Household B.
- › To do this, we take 'Household B', which differs from 'Household A' in only one respect, i.e. by having one child fewer (i.e. no children in this case), but in all other respects is assumed to be an identical household.
- › We then use Equation 2 to estimate the consumption level ' C_B ' required for Household B to achieve the same standard of living as Household A (this is taken to be the same share of expenditure on 'basic goods').

⁷ It was assumed that two person households had a male as the household representative person (HRP) and in a one adult household the HRP was female, that all adults were aged 18-44, that the HRP had further but not higher education, that the HRP was employed, and that in a two adult household the adults were married. All of these characteristics are kept constant between two adult households and one adult households.

- › We then compared these two consumption levels. Household 'B' should require a lower consumption level than the larger 'household A' on account of having one fewer child to attain the same standard of living.
- › The difference between the two was taken as an estimate of the 'cost of a child'.

This process was repeated for each age band, income quintile and basket of good to derive the full model results presented in the tables that follow.

Further model results and robustness

The structure of this section is as follows. We present the results, for each quintile and age group, which are the basis for the results in the main report. In the following section, we present the results from adding an additional year of data to the analysis. The purpose of this analysis is to demonstrate the extent to which results change as the sample changes.

Full model estimates

This section presents the full quintile results from the analysis used in the main body of the report. It also presents the results of changing the sample of data to include an additional year of data (for 2012). The aim of this analysis is to illustrate the sensitivity of the results to changes in the underlying data sample.

In Tables B2 and B3 we present the full quintile by quintile results on which the central results from the main report are based. It is generally the case that BG4 and BG5 (which include childcare costs) provide the highest estimates of the additional cost of a child for children aged 0 – 4, but makes little difference to the additional cost estimates for older children. Given that childcare costs are likely to be less important in looking after older children than they will be in looking after a 0 – 4 year old, these results make sense. While adding more expenditure into the basic good bundle will of course increase the share of households' average budget spent on that enlarged bundle of goods, these will only affect our results to the extent that households with more children consume these goods more. In addition, changing the definition of the basic good bundle will only affect the estimates across age groups to the extent that households with children of that age consume more of these goods than households with children of other ages.

Table B2: Quintile estimates of the cost of a child 2013 – 2016/17 – first child

		0 - 4						5-15						16 - 17					
		BG1	BG2	BG3	BG4	BG5	BG6	BG1	BG2	BG3	BG4	BG5	BG6	BG1	BG2	BG3	BG4	BG5	BG6
Q1	2 Adult HH	98	95	98	95	112	108	104	108	108	112	106	115	131	134	131	134	131	134
	1 Adult HH	101	99	101	99	112	109	105	109	109	112	107	114	128	131	128	131	128	131
Q2	2 Adult HH	114	108	114	107	140	133	140	127	148	135	142	137	159	152	159	153	160	154
	1 Adult HH	89	86	89	85	107	102	109	101	115	107	110	108	130	126	131	127	131	128
Q3	2 Adult HH	90	84	90	83	150	141	114	107	119	113	121	120	181	196	181	196	184	200
	1 Adult HH	102	96	101	96	147	140	116	111	121	115	122	120	183	194	183	194	185	196
Q4	2 Adult HH	83	62	83	61	180	156	121	108	131	116	140	134	200	201	202	204	201	205
	1 Adult HH	87	71	87	70	158	140	121	110	128	117	134	129	186	188	188	189	187	190
Q5	2 Adult HH	109	87	109	87	290	257	131	120	138	127	166	160	213	207	214	208	215	209
	1 Adult HH	127	110	127	110	268	244	146	138	153	144	175	171	218	213	218	213	219	214

Table B3: Quintile estimates of the cost of a child 2013 – 2016/17 – second child

		0 - 4						5-15						16 - 17					
		BG1	BG2	BG3	BG4	BG5	BG6	BG1	BG2	BG3	BG4	BG5	BG6	BG1	BG2	BG3	BG4	BG5	BG6
Q1	2 Adult HH	72	70	72	71	80	79	75	78	78	81	76	82	94	97	94	97	94	97
	1 Adult HH	64	64	64	64	69	69	66	69	67	70	66	71	80	83	80	83	80	83
Q2	2 Adult HH	82	80	82	79	97	94	100	94	105	99	101	100	120	117	120	118	121	119
	1 Adult HH	53	53	53	53	61	60	66	64	69	67	67	67	88	88	88	89	88	89
Q3	2 Adult HH	81	75	81	74	115	108	91	85	95	88	94	90	150	158	150	159	150	159
	1 Adult HH	82	76	81	76	101	95	83	77	85	79	82	79	140	145	140	145	139	143
Q4	2 Adult HH	70	56	70	55	124	108	97	87	103	93	105	99	153	154	155	155	152	154
	1 Adult HH	64	53	63	53	92	81	86	79	89	82	87	83	130	130	131	130	127	127
Q5	2 Adult HH	91	76	91	75	205	183	105	96	110	101	124	119	163	157	163	158	162	157
	1 Adult HH	94	83	94	83	166	150	104	97	107	100	115	110	148	144	149	144	147	143

It is important to illustrate how adding more data to our sample affects these results. We have opted in the main body of the report to utilise four waves of the LCF survey data, but other waves are available and could be incorporated. Ultimately, there is a trade-off between capturing the up to date relationship between households' income, expenditure and standards of living, and obtaining a large sample size. In Table B4 and B5 below, we present the results from estimating exactly the models and undertaking exactly the same calculations using one additional year of data (adjusting for differences in prices). We can see that by adding one more year of data the same general patterns identified in relation to Tables B2 and B3 continue to hold. Nevertheless, there are some clear differences in particular point estimates, although comparing Tables B2 and B4, none of these exceed £29 per week for any quintile.

This simple exercise serves to illustrate that the results produced using this approach can be sensitive to the data used, including fluctuations in the households sampled, and the composition of income quintiles based on each sample of households. While the general pattern of results derived is similar, the precise point estimates for particular income quintiles can vary between samples of data, using exactly the same approach.

Table B4: Quintile estimates of the cost of a child 2012 – 2016/17 – first child

		0 - 4						5-15						16 - 17					
		BG1	BG2	BG3	BG4	BG5	BG6	BG1	BG2	BG3	BG4	BG5	BG6	BG1	BG2	BG3	BG4	BG5	BG6
Q1	2 Adult HH	113	108	113	108	126	121	116	120	121	125	118	127	126	128	127	128	126	128
	1 Adult HH	113	110	113	110	123	120	117	121	121	124	119	126	125	127	125	127	125	127
Q2	2 Adult HH	103	95	102	94	127	117	112	103	119	111	114	112	156	148	160	152	157	153
	1 Adult HH	88	82	87	82	104	98	93	88	99	93	95	94	133	128	136	131	134	132
Q3	2 Adult HH	98	94	97	93	159	151	121	118	128	124	128	131	185	194	185	194	189	198
	1 Adult HH	103	99	102	98	148	141	118	115	123	120	122	124	175	182	176	182	178	184
Q4	2 Adult HH	95	73	94	72	195	169	137	120	147	129	159	149	209	206	211	208	208	207
	1 Adult HH	95	77	94	77	166	147	130	116	137	123	144	136	192	190	194	191	191	190
Q5	2 Adult HH	107	86	106	85	290	259	133	123	141	130	170	164	210	200	211	201	216	206
	1 Adult HH	126	109	125	109	269	246	148	140	155	146	178	173	216	208	217	209	220	213

Table B5: Quintile estimates of the cost of a child 2012 – 2016/17 - second child

		0 - 4						5-15						16 - 17					
		BG1	BG2	BG3	BG4	BG5	BG6	BG1	BG2	BG3	BG4	BG5	BG6	BG1	BG2	BG3	BG4	BG5	BG6
Q1	2 Adult HH	83	81	83	81	91	89	87	90	90	93	88	95	93	95	94	96	93	95
	1 Adult HH	72	72	72	72	77	77	77	80	79	82	78	83	81	83	82	84	81	84
Q2	2 Adult HH	77	73	76	73	91	86	81	78	86	83	82	83	118	115	121	118	118	118
	1 Adult HH	56	55	56	55	63	62	58	57	61	60	58	60	91	91	93	93	91	93
Q3	2 Adult HH	85	79	84	79	119	113	96	92	99	95	97	97	146	151	146	151	147	152
	1 Adult HH	79	74	79	74	98	92	82	78	84	80	81	79	127	128	127	128	125	127
Q4	2 Adult HH	79	63	79	63	136	118	108	95	113	100	117	109	163	160	164	161	160	158
	1 Adult HH	69	57	68	56	99	86	90	81	93	84	93	86	137	134	138	135	133	131
Q5	2 Adult HH	90	75	90	75	205	184	106	98	111	102	126	120	161	153	162	154	163	156
	1 Adult HH	94	83	94	83	166	151	104	97	107	100	115	110	148	142	149	143	148	143

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