Living Costs and Food Survey

Technical Report for survey year:

April 2015 to March 2016

Great Britain and Northern Ireland

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Contents

Introduction

Introduction

This report describes technical aspects of the sampling, fieldwork and data processing for the 2015/16 Living Costs and Food Survey (LCF), formerly the Expenditure and Food Survey (EFS). The survey is undertaken by ONS Social Surveys which is part of the Data Collection Directorate of the Office for National Statistics (ONS).

In the next financial year we would like to review the content and layout of the Living Costs and Food Survey Technical Report. We would therefore like to seek the views of our users to understand how well the current style meets your requirements.

Our users are central to the way we develop this report in the future. Please let us know what you think.

The main chapters of the report cover:
- sample design (chapter 2)
- questionnaire design (chapter 3)
- fieldwork (chapter 4)
- response (chapter 5)
- data processing (chapter 6)
- standard errors (chapter 7)
- glossary of terms (chapter 8)
- appendix (chapter 9)

The remainder of this chapter provides an overview of these chapters.

Background to the LCF

A household expenditure survey has been conducted each year in the UK since 1957. From 1957 to March 2001, the family expenditure and national food surveys (FES and NFS) provided information on household expenditure patterns and food consumption for government and the wider community. In April 2001 these surveys were combined to form the expenditure and food survey (EFS).

In 2008 selected government household surveys led by the Office for National Statistics were combined into one integrated household survey (IHS). In anticipation of this, the EFS moved to a calendar-year basis in January 2006.

The EFS questionnaire became known as the living costs and food (LCF) module of the IHS in 2008, to accommodate the insertion of a core set of IHS questions. More information about the IHS can be found on our website. In quarter 2 of 2014, the LCF came out of the IHS. As a result of this and to meet user needs, the LCF reverted to a financial year basis in March 2015.

ONS has overall project management and financial responsibility for the LCF survey while the Department for Environment, Food and Rural Affairs (Defra) sponsors the specialist food data.

The design of the LCF is based on the FES. The first EFS included all of the questions from the FES, as well as a selection from the NFS. Each individual aged 16 or over in the visited household is asked to keep a diary of daily expenditure for two weeks. Information about regular expenditure, such as rent and mortgage payments, is obtained during a household interview, along with retrospective information on certain large, infrequent expenditures such as those on vehicles.

Detailed questions are asked about the income of each adult member of the household (aged 16 or over). Personal information such as age, sex and marital status are recorded for each household member.

The LCF is a continuous survey with interviews spread evenly over the year to ensure that estimates are not biased by seasonal variation.

Main uses of the LCF

The main reason, historically, for instituting a regular survey on expenditure by households has been to provide information on spending patterns for the Retail Prices Index (RPI).

Apart from the RPI, the LCF expenditure data are used for National and Regional Accounts to compile estimates of household final consumption expenditure; they provide the weights for the Consumer Price Index (CPI) and for Purchasing Power Parities (PPPs) for international price comparisons; and they are used by the Pay Review Bodies governing the salaries of HM Armed Forces and the medical and dental professions. Other users of the LCF expenditure data include the Statistical Office of the European Communities (EUROSTAT) and other government departments such as the Department of Energy and Climate Change (DECC), Her Majesty's Revenue and Customs (HMRC) and the Department for Transport (DfT).

LCF information on income and expenditure is used by other branches in ONS for analyses on the redistribution of income, which study how government taxes and benefits affect household income.
The Department for Environment, Food and Rural Affairs (Defra) publishes separate reports using LCF data on food expenditure to estimate consumption and nutrient intake which can be found on the GOV.UK website.

The Department for Transport uses LCF data to monitor and forecast levels of car ownership and use, and in studies examining the effects of motoring taxes.

LCF data are also used extensively outside government, by academic researchers and business and market researchers. One example is an academic study that has used LCF data as part of a wider study, to obtain a clear picture of utility expenditure patterns across the European Union.

The main results from the survey are published by ONS in the annual report Family Spending, which can be found on the ONS website.

Comparison with another source

A useful comparison for LCF estimates is with household final consumption expenditure (HHFCE) figures published in Consumer Trends and used in the UK national accounts.

Consumer trends measures the personal expenditure on goods and services by UK households, from the viewpoint of how this relates to Gross Domestic Product. This is a different viewpoint to the estimates published in Family Spending, which include spending that does not relate to an economic output. In addition to this, HHFCE estimates use a number of administrative and survey sources, of which the LCF survey is one. Estimates in Consumer Trends and Family Spending therefore differ, due to the aforementioned different data sources and viewpoints.

Some categories are more aligned than others, particularly when the LCF is the main source of data for the HHFCE estimates. Expenditure on restaurants and hotels is one of these. According to Family Spending estimates, expenditure on restaurants and hotels increased by 6.12 percentage points (without adjusting for inflation) between 2014/15 and 2015/16. Similarly, National Accounts household expenditure estimates for the same category show a 5.48 percentage increase over the same time period.

Household expenditure on housing, water, electricity, gas and other fuels is a category where data sources and concepts are different between the two publications. For example, the HHFCE estimates use Valuation Office Agency data to calculate imputed rents (which are not measured in family spending) and use energy expenditure data from the Department of Energy and Climate Change. Family Spending estimates showed that expenditure on housing, water, electricity, gas and other fuels increased by 1.58 percentage points (without adjusting for inflation) between 2014/15 and 2015/16. National Accounts household expenditure estimates for the same category show a 0.41 percentage decrease.

Overview of fieldwork

Fieldwork covered the 2015/16 financial year, from April 2015 to March 2016. Respondents completed a face-to-face interview with questions on regular items of household expenditure and income details. Each individual aged 16 or over in the visited household were asked to keep a diary of daily expenditure for two weeks.

Sample selection

The LCF sample for Great Britain is a multi-stage stratified random sample with clustering. Addresses with 'small user' postcodes are drawn from the postcode address file (PAF).

In Northern Ireland, field work for the LCF is conducted by the central survey unit of the Northern Ireland Statistics and Research Agency (NISRA). A systematic random sample of private addresses is drawn from the Land and Property Services Agency's (LPSA) property database.

Interview

For both Great Britain and Northern Ireland, interviews are conducted by computer assisted personal interviewing (CAPI) using laptops and the Blaise software package.

Re-issues

Sampled addresses where contact with the household is not possible or an interview is refused are in some cases re-issued. Re-issued addresses are assigned to field managers for placement with interviewers with routine quotas in adjacent areas. Re-issued addresses are processed independently of the routinely collected interviews and diaries and are then added to the annual dataset.

Data processing and data quality

Consistency and range checks are applied to interview data provided by respondents as the data are collected. Interview data are further checked at the edit stage by the coding and editing team when completed interviews are returned to ONS. Manual checks of diary entries are made by interviewers before they are returned to ONS. Further checks of diary entries are made as they are coded by the coding and editing team and entered into the Blaise instruments. Once edited and coded, systematic checks are applied to ensure consistency between diaries and interviews, and to examine the coding of types of diary entries known to have been inconsistently coded in the past.

Diary

Each individual aged 16 or over in the household is asked to keep a detailed record of daily expenditure for two weeks. Children aged between 7 and 15 years are asked to keep a simplified diary of daily expenditure.

Response rate

The response rate to the survey in Great Britain in 2015/16 was 46%. The response rate for Northern Ireland was 62% for 2015/16. Response to the survey is discussed in more detail in the section titled 'Response'.

Sample design

The sample of addresses

The LCF collects information about household expenditure; addresses which do not contain a private household are ineligible for inclusion. Most commercial premises or institutions are excluded from the sample as it is drawn from a version of the Postcode Address File (PAF) containing addresses with 'small user' postcodes only. For the selected addresses, interviewers are instructed to call at all institutional addresses (for instance, hotels, guest houses, hostels, schools etc) to establish whether there is a private household at the address.

The Great Britain sample

The LCF sample for Great Britain is drawn as a multi-stage stratified random sample with clustering. A representative sample of the private household population is drawn, with Scottish offshore islands and the Isles of Scilly excluded from the sample.

Addresses on the PAF with 'small user' postcodes are used as the sample frame for the LCF. The PAF is constructed by the Post Office as a list of all delivery points (addresses) in the country. Addresses with 'small user' postcodes on the PAF receive on average fewer than 50 items of mail per day. By using this file the majority of businesses and institutions are excluded from the sampling frame. ONS maintains its own copy of the PAF, which is updated with new addresses twice a year. Checks are made to each new version of the ONS maintained PAF to ensure its integrity; some identifiable business addresses are removed to improve fieldwork and sampling efficiency.

The LCF employs a two-stage sample design. Postcode sectors are used as the Primary Sampling Units (PSUs), with 18 addresses selected from each PSU to form the monthly interviewer quota. The GB initial sample of 11,484 households is made up of 638 quotas. Quotas are assigned (53 or 54 each month) to ensure a nationally representative sample for each quarter of the year. The sample was reduced by 5% in 2007.

Postcode sectors are drawn from a list stratified using area-level data from the 2001 Census. The following stratifiers are used:

Region

The region is based on what was Government Office Regions (GOR[1]) sub-divided into metropolitan and non-metropolitan areas.

National Statistics Socio-Economic Classification (NS-SEC) of Household representative person (HRP)

Each major stratum is divided into four bands according to the proportion of households whose head was in a professional or managerial occupation (NS-SEC 1-3). Until 2004/05, this stratifier was based upon Socio-Economic Groups (SEG) 1-5 and 12. Although the new coding of occupation by NS-SEC is not directly comparable with the old SEG, methodological work has shown that the stratifier calculated using the NS-SEC approximates the SEG stratifier well.

Car ownership

Within each band, PSUs are sorted in order of the proportion of households with no car.

Socio-economic group of HRP and car ownership were first introduced as stratifiers for the 1996/97 survey. Until 2004/05, area level stratifiers were derived from 1991 Census data; but since 2005/06 it has been possible to update the stratifiers and use 2001 Census data.

The Northern Ireland sample

Sampling and fieldwork in Northern Ireland are carried out by the Central Survey Unit of NISRA. In Northern Ireland 300 addresses are sampled using the Land and Property Services Agency's (LPSA) property database. This database lists all residential addresses, therefore each household has an equal chance of selection.

A systematic random sample of residential addresses is drawn from the LPSA's database. The database is sorted by district council and ward. Therefore the systematic sample drawn from the database is implicitly stratified geographically.

Household definition

The LCF is a voluntary sample survey of private households. The basic unit of the survey is the household. The LCF (in line with other government household surveys) uses the harmonised definition of a household: A

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[1] A modified version of region which includes Merseyside in the North West has been used since the 2001/02 EFS. It was previously a separate category.

household comprises 1 person living alone or a group of people (not necessarily related, living at the same address) who share cooking facilities AND share a living room or sitting room or dining area.

Members of a household are not necessarily related by blood or marriage; resident domestic servants are included as part of the household. The survey includes private households only. People living in hostels, hotels, boarding houses or institutions are excluded unless they form a private household within the institution (e.g. a warden living in a self-contained flat within a retirement home). Households are also included even if some or all members are not British subjects.

Household Reference Person (HRP)

From 2001/02, the concept of Household Reference Person (HRP) was adopted on all government-sponsored surveys, to replace the head of household.

A key difference between HRP and head of household is that the HRP must always be a householder, whereas the head of household was always the husband/male partner, who may not have been a householder himself (see Glossary for further details).

Multi-household procedures

For addresses containing more than one household, set procedures are followed to give each household only one chance of selection. All addresses in England and Wales, and Scotland have only one chance of selection in the LCF sample. If an address contains more than one household they use a kish grid to select one household to interview.

Ineligible households

Interviewers code an address as ineligible if:

- there is no trace of the address – the address is incorrect or inadequate to allow the interviewer to find a housing unit
- it is not yet built – the building had not yet been built or completed
- it has been demolished or is derelict
- it is empty at the first call – the address was empty/unoccupied when the interviewer made their first call
- it is non-residential – the address is occupied solely for business, school, government office, other organisation etc, with no resident person

- it is an institution – the interviewer must establish that there is no private household which considers the institution to be their main or only address
- it is temporary accommodation or a second home – a household is living at the address temporarily, but they normally live elsewhere or this is a second home. This is likely to apply to seasonal, vacation or temporary residences, or
- the household contains a foreign diplomat or foreign serviceman or woman

Questionnaire design

Interview and diary overview

Households selected for the LCF are asked to complete an interview covering information about the household, regular items of household expenditure and income details. Following this, all adults within the household are asked to keep a diary to record all items of expenditure in the following two weeks. Children aged 7 to 15 years are also asked to keep a record of their personal expenditure.

CAPI interviewing

The LCF interview consists of a general household section and an individual section for each of the adults within the household.

The household section records information about the socio-demographic characteristics of household members (age, gender, marital status), and about how they are related (e.g. spouse, partner, son/daughter, relative, etc). It also asks about regular items of expenditure, such as mortgage/rent payments, insurances, utility bills, education fees and infrequent purchases, such as vehicles. These questions are put to all household members (if interviewed together) or to the main household respondent, preferably the HRP or their spouse/partner.

The second part of the interview covers employment and income details, including detailed questions about receipt of benefits, allowances and other financial assets. It is asked of each household member over 16 years of age.

Interviews are conducted using Computer Assisted Personal Interviewing (CAPI). Blaise, a software system developed by Statistics Netherlands, is used to program the LCF questionnaire.

Questionnaire Review

In order to ensure the LCF questionnaire is up-to-date it is important that questions are regularly reviewed so that relevant changes can be made. Reviewing the questionnaire is a process of continuous improvement.

Changes to the survey in 2015/16

Television

An option for 'Other Digital TV subscription' has been added to the question regarding how a respondent watches television on their main TV set.

Insurance

'Domestic appliances/white goods cover' is now included as an option under insurance policy.

Utilities

'Standing Order' removed as a method of payment for gas and electric.

Internet

'Pay as you go' included as a new method of payment.

Flights

Reference to payment of flights specifically from a UK airport in the last 12 months has been removed so that the question now covers payment of any flights.

Payment Methods

'Bank Transfer' included as a new method of payment throughout the majority of the survey.

Halls of Residence

Since April 2015, students in Halls of Residence are no longer asked core questions.

Benefits

In January 2016 Universal Credit Budgeting Advance and Local Authority Loans were removed from the calculation of benefit amounts as they are loans requiring repayment. Benefits are not repaid.

Harmonisation of questions

In order to allow analysts to compare results across surveys a number of classificatory questions within the LCF questionnaire are harmonised[2]. Table 3.1 lists the questions that are harmonised on the LCF and when they were first included.

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[2] For more information on harmonised questions click here or email harmonisation@ons.gov.uk

Table 3.1 Harmonised questions on the LCF

Great Britain

Topics	LCF - harmonisation status
Primary set	Year[1]
Household response unit	00/01
Gender	A[2]
Age last birthday (if less than 20 years of age)	96/97
Date of birth	96/97
Marital status (legal)	96/97
Living arrangements	96/97
Who owns or rents accommodation	96/97
Head of household (HOH)	A[2]
Household reference person (HRP)	00/01
Relationship to head of household	96/97
Ethnic origin	00/01
National identity	00/01
Tenure	96/97
Economic activity (ILO)	96/97
Industry, occupation, socio-economic clasifications	96/97
Full- time and part -time work	96/97
Secondary set	
Social security benefits	97/98
Consumer durables	96/97
Length of time since last paid work	96/97
Time in present job	96/97
Usual hours in main job	96/97
Accommodation type	96/97
Housing costs and benefits	96/97
Length of residence	96/97
Vehicle ownership/continuous use	96/97
Health	X[3]

Year[1] = harmonised for that 'year'

A[2] = harmonised pre 1996-97

X[3] = topic not on survey

Difficult to obtain information

In order to collect sufficiently detailed and accurate information interviewers are instructed to ask respondents to check figures and consult relevant documentation where available. However, situations arise when the respondent does not have the information required to answer a question. Although "Don't know" responses can lead to blanks appearing in the raw data, they are accepted as permissible answers to some LCF questions. Interviewers are encouraged to collect the best estimate that the respondent is able to give and to record any relevant information using the note-pad facility within Blaise. From these notes it is sometimes possible for data to be imputed at the editing stage. This differs from the FES, which did not accept refusals to questions on monetary amounts of expenditure or income, other than for amounts invested. On the FES a refusal to any monetary question constituted a refusal to the survey as a whole and the interview was terminated.

Full income and short income

All adult members of a household are asked to supply detailed information about their income; this is referred to as "full income". In some cases respondents are reluctant to provide this level of detail; however, they may be willing to answer a simplified set of questions which permits the household to be included as a partial response[3]. From 2001/02 to 2007 the EFS included a reduced set of income questions, referred to as "short income". From 2008 onwards the short income section was removed.

Proxy interviews

Questions about general household affairs are put to all household members or to the household reference person (HRP), questions about work and income are put to the individual members of the household. Where a member of the household is not present during the household interview, another member of the household (for example a spouse) may be able to provide information about the absent person. The individual's interview is then identified as a proxy interview. Under LCF rules, the expenditure diary cannot be completed by proxy; if a household member is not present during the diary period they are classified as an absent spender.

In 2001–02, the EFS began including households that contained a proxy interview. In that year, 12% of all responding households contained at least one proxy interview. In 2015/16 the percentage of responding households with a proxy interview was 27%. Despite a slight decrease since 2014, the overall trend in the percentage of proxy interviews over time is an increasing

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[3] See Chapter 5, "Partial response".

one. This trend reflects general response trends for social surveys; interviewers are finding it increasingly difficult to make initial contact with households and to secure interviews with each household member.

Table 3.2 Percentage of households containing proxy interviews, 2007 to 2015/16
Great Britain

	2007	2008	2009	2010	2011	2012	2013	2014	2015/16
				Percentage of households					
Proxy interviews	17	21	23	22	24	25	26	29	27
Total number of households	**6,059**	**5,545**	**5,271**	**5,222**	**5,116**	**5,531**	**5,425**	**4,993**	**4,760**

Analysis of the 2015/16 data revealed that the inclusion of proxy interviews increased response from above average income households. For the 2015/16 survey, the average gross normal weekly household income was 17% higher than it would have been if proxy interviews had not been accepted. Similar findings were obtained with respect to expenditure: total spending was 13% higher than if proxy interviews had not been included. Use of proxies enhances the sample size and hence the precision of the figures obtained. It also enables the survey to capture the income and expenditure from (on average) higher-earning households and hence ensure that these households are represented fully in the survey. This must be weighed against the risk that the proxy interviews may not provide exactly the same information as direct interviews, but the available evidence suggests that including proxies provides higher data quality overall.

The diary

Following the interview, all adults (aged 16 and over) in the household receive a paper diary in which they are asked to record all their purchases for two weeks. The diary is organised into ten sections to help respondents remember and record different types of expenditure. The first six sections cover daily expenditure, with the sections repeated for each of the 14 days covered by the diary. The remaining four sections cover the entire period of the diary's placement.

The daily sections of the diary are:
1. food and drink brought home (excluding takeaways)
2. takeaway meals and snacks eaten at home
3. meals, snacks and drinks consumed away from the home
4. clothing and footwear
5. other payments and purchases
6. winnings from lottery, bingo, betting shops, football pools, raffles, etc

Each item of expenditure is recorded in the appropriate section together with the amount paid (or amount won for the winnings section). Additional section-specific information may also be requested, e.g. the weights of food items.

Sections 7 to 9 cover the whole 14-day diary-keeping period and record home-grown and wild food, holiday expenditure abroad and business refunds. Section 10 is used to record details of special circumstances occurring during the diary keeping period. This information can be used during quality assurance to investigate households with unexpected expenditure patterns.

A different diary is issued to children aged 7 to 15; its layout is much simpler with details on each item of expenditure, the amount paid, where it was purchased and where it was consumed (for food and drinks only) recorded. Children's diaries are organised on a day-by-day basis.

Fieldwork

Overview of fieldwork design

LCF interviews are all face-to-face and are conducted by ONS interviewers[4] at the household address, using laptops.

The LCF sample of 11,484 addresses, drawn from the Postcode Address File (PAF), is organised into 638 quotas[5] of 18 addresses, which are assigned equally to each month of the year. To minimise travel time and costs an interviewer is usually assigned a complete LCF quota.

Interviewer briefings

Before being assigned an LCF quota, new interviewers are required to attend an LCF specific briefing day. Prior to the briefing day, interviewers are supplied with instructions and background information about the survey. New interviewers are also asked to complete an LCF diary for seven days, these are checked and feedback is given at the briefing.

Contacting respondents

In advance of the interviewer's first call at the sampled address, ONS send a letter and a book of first class stamps (as a memory jogger) to the household to inform them of the visit and the content of the survey. The interviewer provides more information when they call and may leave a leaflet giving further details of the survey, uses of the data, and arrangements to ensure confidentiality.

These leaflets, together with spare copies of the advance letter, are normally dispatched to interviewers by 48hr delivery a week before the start of the field period. Interviewers also receive:
- survey pens (to distribute to respondents)
- adult diaries
- youth diaries
- pocket diaries
- envopacks (to dispatch the diaries back to Titchfield if direct contact with respondents isn't possible)

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[4] In Great Britain.
[5] See chapter 2, "The Sample Design".

Placing pattern

The LCF provides estimates of average weekly expenditure; it therefore requires interviews and diaries to be representative of the whole year. The sample design ensures an even distribution of interviews across the months.

As expenditure patterns also vary through the month interviewers are asked to achieve an even distribution of interviews within each month; for 2015/16 they were asked to aim for the pattern shown in Table 4.1.

Table 4.1 Dates of the placing weeks, 2015/16
United Kingdom

Placing week	Dates for all months (except February)	Dates for February	Placement pattern Number of interviews
1	1st to 7th	1st to 7th	4
2	8th to 15th	8th to 14th	5
3	16th to 23rd	15th to 21st	4
4	24th to end of month	22nd to end of month	5
	Total number of interviews (per quota)		18

The placement pattern achieved in 2015/16 is shown in Table 4.2; it shows the distribution of LCF interviews by the date and week of the month.

Table 4.2 Week of the month during which the interview was carried out, 2015/16
Great Britain

Placing Week	Achieved Placement
	Percentage of households
1	26
2	36
3	24
4	14
Total	**100**

Note: The sum of component items may not sum to the total due to rounding

Contacting the sample address

In seeking an interview, interviewers are requested to make at least four separate calls, including two evening calls. Interviewers are also required to call at sampled institutional addresses (e.g. hotels, guesthouses, hostels and schools) to establish whether there is a private household at the address. Interviewers are instructed to continue making additional calls at non-contacted addresses throughout the field period.

Pattern of calls

With the need to complete interviews and place diaries throughout the reporting month, a pattern of calls for LCF interviewers has been established:

The initial call

The initial call can help to establish how many households live at the selected address. For addresses containing more than one household, set procedures are followed to ensure each household has one and only one chance of selection. At the selected household(s), the interviewer explains the purpose of the survey. If the household is co-operative, the interviewer will try to make an appointment to see all adult members for interview.

The interview/diary placing call

If possible, interviews for all household members are conducted in one visit. After completing the interview respondents keep a two-week diary of their expenditure, usually starting from the day of interview or the following day. If the start of the diaries is delayed by more than two days, the interviewer checks that the information collected in the interview is still up-to-date, for example, whether any household bills have been received since the original interview.

On the FES interviewers were required to assemble all adults in the household before starting the interview. However, since the 2001/02 (EFS), interviewers have been allowed to begin the interview with some adults not present, provided the HRP or their spouse is present and they obtain the information from the missing adults at a later date.

At this call the interviewer also explains how to complete the expenditure diary and sets the start date for the diary.

Where a member of the household is not present during the household interview, another member of the household (e.g. spouse) may be able to

provide information about the absent person (proxy interviews, see chapter 3).

Interim checking call(s)

Interviewers make at least one checking call on the household but in practice may make more calls if needed. The first checking call is normally within five days of the start of diary keeping or the first call. The interviewer checks that the respondent is not having problems completing the diary and is giving sufficient detail to permit items to be coded. If necessary, further instructions and guidance are given to the respondent. Interviewers can also use these calls to clarify inconsistencies in the answers given during the interview.

Final/collecting call

This is made as soon as possible after the end of the diary keeping period. The interviewer completes a thorough check of the diary information, probing for further detail where necessary and adding this to the paper diary. The interviewer also collects information needed to send the incentive payments. In 2015/16, a gift of £10 was made to each adult (aged 16 and over) in responding households and £5 to each child (aged 7 to 15) who completed a diary. Payments were made after completion of all elements of the survey but were mentioned in the advance letter.

Fieldwork continues for two weeks after the last interview/placing call, during this time diary checking and final calls are made. These additional two weeks are not used for interviewing/placing; all interviewing/placing should be completed within the calendar month. The LCF does not have an extension period.

Interview length

The Blaise questionnaire includes audit trail functionality to record all interviewer interactions[6] with the questionnaire, along with detailed information about time spent on each question. These times can be aggregated to provide an overall estimate of the length of the interview and information about specific sections of the questionnaire.

For 2015/16, audit trail files were analysed to improve the understanding of the survey process and, in particular, to monitor the overall time and number of sessions required to complete an interview with a responding household.

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[6] Fields which were entered and left, fields which were amended.

Although LCF interviewers are instructed to gather all adult members of the household together to carry out the interview, some flexibility is allowed and, if necessary, interviewers can complete the interview in more than one session. This is particularly useful when interviewing large households where it may be difficult to arrange an appointment with all adult members at the same time. The interviewer can arrange separate appointments with one or more adults to complete the income section of the questionnaire. Splitting the interview into several sessions can ease the interviewing burden on those respondents who may find it tiring or difficult to answer all questions at once.

The length of interviews varied across households (see figure 4.1). The mean interview length was 74 minutes in 2015/16.This shows that interviews are, on average, two minutes longer than in 2014. This change appears to be driven by increases in the average length of interviews in two and four person households.

Figure 4.2 shows the mean interview time generally increased as the household size and number of adults in a household increased.

Figure 4.1 Length of interview, 2015/16
Great Britain
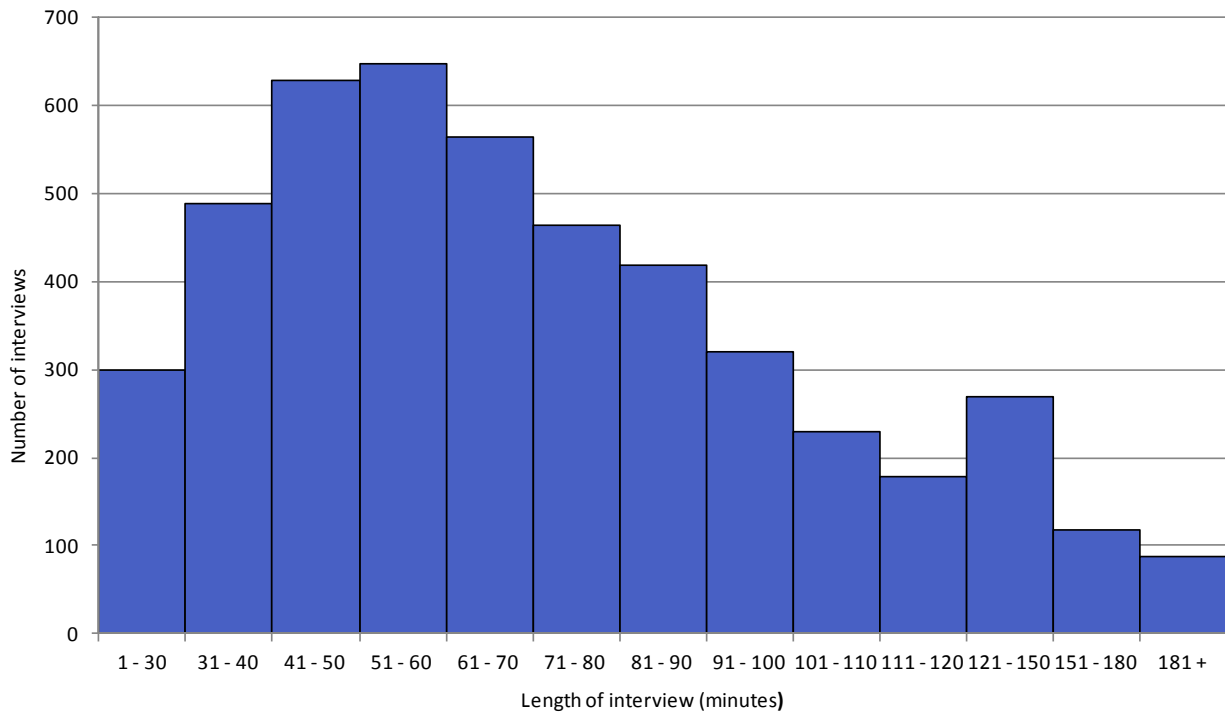
Figure 4.2 Mean interview time by household size, 2015/16
Great Britain
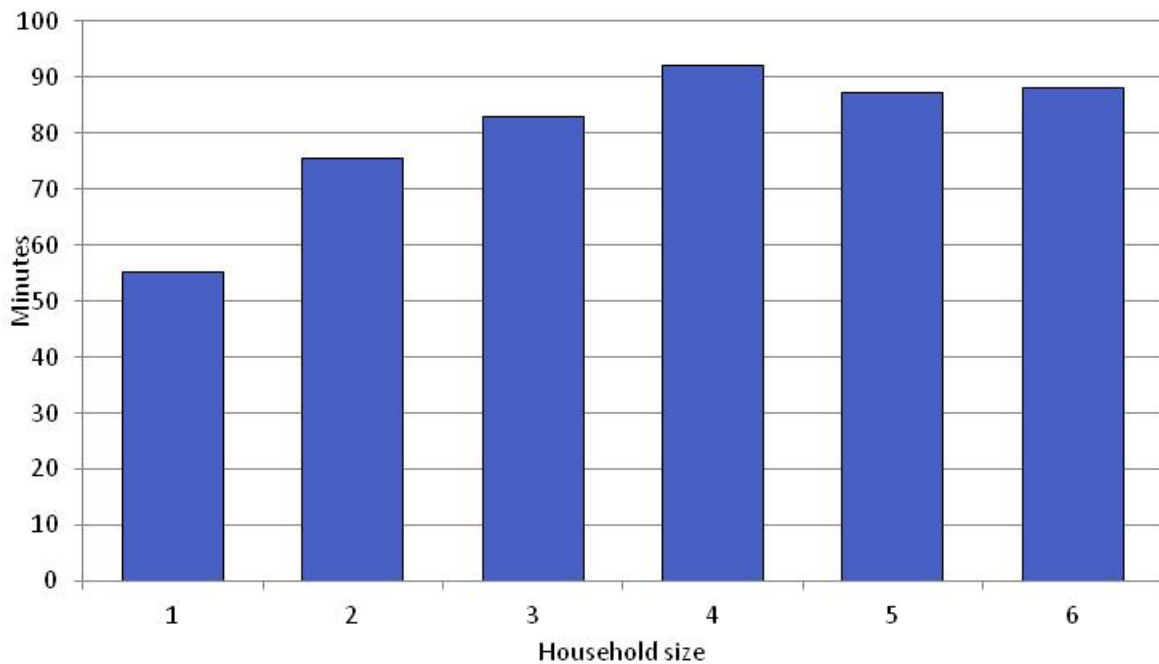
Checks on data quality

Consistency and range checks are applied to interview data provided by respondents. These checks are programmed within Blaise and can be carried out by the interviewer either during the interview or later at home.

Consistency checks can be triggered by contradictory responses to questions in different parts of the questionnaire; a warning is then displayed asking the interviewer to confirm the response. For example, a respondent may indicate that they are receiving maternity benefits in the income section, having failed to indicate that they were pregnant in the household section. Similarly range checks can be triggered when an unlikely value is entered in response to a question; for example, a warning can be displayed if a respondent's Council Tax Band is inconsistent with the amount of Council Tax they claim to pay.

These checks may be defined as either hard or soft checks. Values that fail a hard check must be changed in order for the interview to proceed. Soft checks can be suppressed if the interviewer has checked that the information is correct (to the best of their/the respondent's knowledge). Interviewers are expected to enter a note to explain the circumstances of a soft check being suppressed. Most interviewer checks are soft.

The LCF distinguishes between checks triggered during the interview and those run later as home checks. Home checks are possible on the LCF because the interviewer makes a number of visits to the household and can clarify information at a later stage. Home checks tend to be more complex as they look across a number of responses, sometimes in different parts of the questionnaire. Interviewers may therefore spend time working out what needs to be checked or corrected and then explaining the household's circumstances in a note.

Manual checks of diary entries are made by interviewers before they are returned to ONS. As described in the placing pattern section, interviewers make an interim checking call to respondents to ensure the correct detail is being recorded in the diary. Interviewers also make a final check of the diaries before they are returned to ONS, often adding such detail as weights and volumes originally omitted by diary keepers with detail collected from retailers.

Further checks are applied to interviews and diaries once they are returned to ONS (see chapter 6).

Response

Introduction

Response rates are often used as an indicator of a survey's quality and how representative a sample is of the target population. Response rates do not in themselves measure how representative a sample is but are a proxy measure of the levels of likely bias. It is generally assumed that the lower the response rates the greater the likelihood of bias in the results. This is because the characteristics of non-responding households may differ from those of responding households causing certain types of households to be under-represented in the sample.

This chapter presents data on overall response rates, re-issues, partials and a comparison of responding and non-responding households, as well some analysis of response rates over time.

Overall response

Table 5.1 provides a breakdown of the final outcome codes for all cases in the 2015/16 LCF sample. Response is defined using the harmonised rules for all ONS surveys.

Table 5.1 Response summary (harmonised rules), 2015/16

Great Britain

	Number of households or addresses	Percentage of set sample	Percentage of eligible sample
Set sample	11,484	100	-
Ineligible	1,136	10	-
Extra households (multi-households)	1	0	-
Total eligible	**10,349**		**100**
Co-operating households (includes 179 partials)	4,760		46
Refusals	4,301		42
Non-Contact	690		7
Unknown eligibility	44		0
Other non-response	558		5

Of the 11,484 addresses in the sample for Great Britain, 10% did not contain a private household and were classified as ineligible. This category includes empty, demolished or derelict addresses; non-residential addresses; and temporary accommodation.

Less than 1% of the sample was identified as extra households, i.e. multi-occupancy households. There has been a significant decrease in the number of extra households due to a change in methodology regarding interviewing at addresses with multiple households. Until 2010 interviewers were asked to interview all of the households at an address (up to three). From 2010 interviewers are only required to interview one household per address, and are instructed to use kish grid to select which household to interview.

Of the 4,760 responding households in Great Britain 4,581 co-operated fully.

A household was coded as fully co-operating if:
- all adults aged 16 and over co-operated with the interview
- no income questions in the questionnaire were refused
- all adults kept a two-week record of their expenditure; and
- the information given was complete and useable

However, a further 179 households provided sufficient information to be included as partial responses.

Of the eligible sample, it was not possible to contact 12% of addresses and a further 42% refused to take part. This produced an overall response rate for the 2015/16 LCF of 46% in Great Britain.

LCF response rates over time

Response rates to household surveys have been declining in recent years. In 2015/16, the LCF's response rate for Great Britain was 46%, compared with around 60% in 2000/01. It should be noted that the LCF requires satisfactory completion of both the household questionnaire and diary.

Figure 5.2 FES/EFS/LCF[1] response rates: 1977 to 2015/16
Great Britain
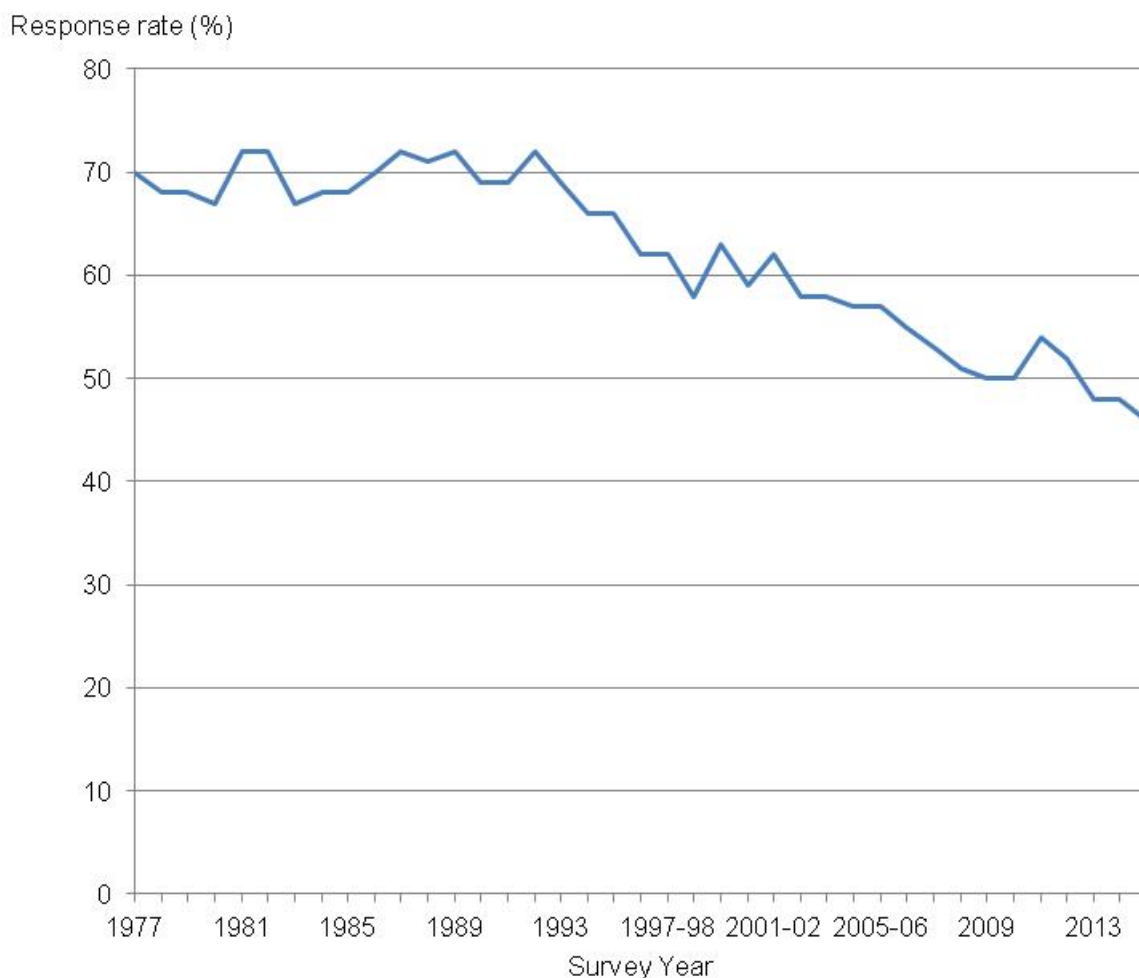
[1] The Family Expenditure Survey was replaced with the Expenditure and Food Survey in 2001 and further replaced with the Living Costs and Food Survey in 2008. New harmonised response rules account for a 0.7% drop in response in 1998/99 and a 0.5% drop in response in 1999-00.

As mentioned earlier, it is generally assumed that the lower the response rates the greater the likelihood of bias in the results. Analysis of the UK Labour Force Survey (LFS) tentatively reported an effect for some variables[7]. However, there is little evidence to suggest that a limited drop in response will affect bias to a large degree in the LCF. Nevertheless, to maintain quality of the data, methods such as proxy and partial interviews are set in place to minimise non-response for the LCF.

Lower response also potentially impacts on precision, with fewer cases being completed. However, considering the years from 2007 (when the current set sample size was adopted for Great Britain), the majority of percentage standard errors at COICOP level have not changed measurably (see Table A1 of Family Spending, 2015/16 standard errors). Furthermore, the National Statistics Quality Review of the LCF, published in May 2015, comments that the impact of decreasing response rates on the precision of expenditure estimates is lower than what would be expected from the fall in the achieved sample and one explanation could be that there is less variation between returns over time.

For users to fully utilise LCF data, sample sizes and response rates must be considered before using estimates for informative analysis. Therefore, sample sizes are provided within each table of Family Spending, and small sample sizes are highlighted for cautionary measures. Where necessary, tables with detailed breakdowns are averaged across three years to overcome accuracy and disclosure issues.

Partial response

There are 3 types of partial response accepted on the LCF:
- all adults complete the full income section of the interview, but one or more adults in the household refuse to keep the diary
- all adults in the household keep the diary, but one or more adults provides only partial income information
- one or more adults refuses to keep the diary and one or more adults provides only partial income information

All partial responses must contain a diary from the main diary keeper (MDK), who is the person who does most of the shopping in the household. If the MDK refuses to complete the diary the household is classified as a refusal.

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[7] http://www.ons.gov.uk/ons/guide-method/method-quality/survey-methodology-bulletin/smb-64/index.html

In 2015/16 partial responses accounted for 4% (179 households) of all co-operating households. Of these 179 partials, 173 occurred because one or more adults in the household refused to keep the diary. (Table 5.3).

Table 5.3 Type of partial response, 2015/16
          Great Britain

Type of partial response	Number of households	Percentage of partials
1. One or more adults refuse to keep the diary[1]	173	97
2. One or more adults provide only partial income information	6	3
All	**179**	**100**

[1] Diary is present for the main diary keeper

Trends in response

Table 5.4 compares the main outcome categories in LCF samples. The proportion of households refusing to take part in the survey over the last five years increased from 37% to 42%. Over the same period the percentage of households who could not be contacted has decreased from 13% to 12%.

Table 5.4 Response summary: 2010 to 2015/16
Great Britain

	2010		2011		2012	
	Number of households	Percentage of households	Number of households	Percentage of households	Number of households	Percentage of households
Set sample	11,484		11,484		11,484	
Total eligible	10,314	100	10,303	100	10,386	100
Refusals	3,810	37	3,590	35	3,311	32
Non-contacts	1,388	13	1,182	11	1,650	16
Co-operating	5,116	50	5,531	53	5,425	52

	2013		2014		2015/16	
	Number of households	Percentage of households	Number of households	Percentage of households	Number of households	Percentage of households
Set sample	11,484		11,484		11,484	
Total eligible	10,354	100	10,333	100	10,349	100
Refusals	3,555	34	3,843	37	4,301	42
Non-contacts[1]	1,806	17	1,508	15	1,288	12
Co-operating	4,993	48	4,982	48	4,760	46

Note: The sum of component items may not sum to the total due to rounding
[1] Non-contacts are all non-contacts/non-response

Variation in response

Table 5.5 shows quarterly response rates from 2015/16 (full details for 2015/16 are given in the Appendix). In 2015/16 response varied between quarters, and response was lowest at 42% from January – March 2016.

Table 5.5 Quarterly response, 2004 to March 2016
Great Britain

Year	January-March Responding sample Number of households	Response rate Percentage	April-June Responding sample Number of households	Response rate Percentage
2004	1,562	56	1,545	55
2005	1,529	56	1,589	58
2006	1,530	56	1,596	58
2007	1,376	53	1,388	54
2008	1,305	50	1,293	49
2009	1,334	52	1,307	51
2010	1,304	51	1,273	49
2011	1,351	53	1,404	55
2012	1,429	55	1,391	54
2013	1,246	48	1,249	48
2014	1,275	48	1,285	50
2015	1,320	49	1,256	48
2016	1,104	42		

Year	July-September Responding sample Number of households	Response rate Percentage	October-December Responding sample Number of households	Response rate Percentage
2004	1,606	58	1,564	57
2005	1,539	55	1,601	57
2006	1,515	56	1,418	52
2007	1,406	54	1,375	52
2008	1,368	52	1,278	51
2009	1,329	51	1,253	49
2010	1,325	52	1,214	47
2011	1,420	55	1,356	52
2012	1,333	51	1,272	49
2013	1,265	49	1,233	48
2014	1,187	46	1,235	48
2015	1,190	46	1,210	47

Table 5.6 shows response rates by region and country. As observed across many ONS social surveys, London had the lowest response rate (35%). Northern Ireland had the greatest response rate in the UK (62%) and, of the GB regions, Yorkshire and The Humber had the greatest response (51%).

Table 5.6 Response by countries and regions, 2015/16
United Kingdom

Government Office Region and Country	Responding sample	Response rate
	Number of households	Percentage
North East	230	50
North West	541	45
Yorkshire and The Humber	457	51
East Midlands	388	50
West Midlands	432	47
Eastern	504	49
London	428	35
South East	668	45
South West	465	50
Wales	227	45
Scotland	420	46
Northern Ireland	158	62
Total of number of households	**4,918**	**46**

*Includes Northern Ireland figures

It is acknowledged that falling response rates are a problem and various measures are being taken to counteract them. We are concentrating on three main areas that either directly or indirectly impact on response. They are:

Field capacity - this includes introducing new technology to our field force, updating the survey allocation process across all ONS surveys to obtain a better balance of work to interviewer availability and appointing a ONS Social Surveys Response Manager who will forecast response and take remedial action if deemed necessary.

Skills - this includes expanding the capacity in HQ to train new interviewers and improving support to field interviewers and survey teams from the telephone operations area.

LCF specific initiatives - plans are under way to review survey incentives, (both conditional and unconditional) and to review respondent material.

One of the main measures currently taken to improve response is to re-issue non-contacts and some refusals.

Re-issues

Addresses where the interviewer has been unable to make contact or the household has refused[8], but an interviewer judges that household suitable for re-issue, are re-distributed to field managers for assignment to interviewers at a later date. These are allocated on an ad-hoc basis to interviewers who are able to accept them alongside their main quota of work. Interviewers are expected to complete the re-issues within the field period of their main quota.

Interview and diary data collected at re-issued addresses are processed independently of the routinely collected data. Once processed these data are aggregated with the routinely collected data of the quarter when the interview was carried out. The increased response rate generated by re-issued addresses is, however, added to the original month of issue. In 2015/16, 876 addresses were re-issued, of which 53 were converted into responding households. This increased the overall response rate by 1 percentage point.

Re-issued cases that were converted to responding cases were similar, in terms of number of adults and children, to those who initially responded (table 5.7 and 5.8).

Table 5.7 Number of adults in responding household by whether household was reissued, 2015/16

Great Britain

Number of adults	Reissue interviews	All responding
	Percentage of households	
1	30	32
2	59	55
3	8	10
4 or more	4	4
All	**100**	**100**
Total number of households	**53**	**4,760**

[8] Refusals to the Head Quarters (HQ) letter were not reissued

Table 5.8 Number of children in household by whether household was reissued, 2015/16

Great Britain

Number of children	Reissue interviews	All responding
	Percentage of households	
0	72	72
1	9	13
2	11	11
3	6	3
4 or more	2	1
All	**100**	**100**
Total number of households	**53**	**4,760**

Reasons for refusal

Interviewers on the LCF routinely collect information about respondents who do not take part in the survey. Interviewers record the main reason why people refuse before or during an interview from a list of pre-coded answers. The reasons are recorded at a household level but will reflect the comments made by the individual(s) the interviewer has spoken to.

In 2015/16, the three most commonly cited reasons for refusing to take part in the survey were:

- can't be bothered - 18%
- genuinely too busy - 15%
- other - 13%

Table 5.9 Reasons for refusal, 2015/16
Great Britain

Reasons for refusal	Percentage of households
Can't be bothered	18
Genuinely too busy	15
Other	13
Too old/infirmed	11
Invasion of privacy	11
Doesn't believe in surveys	10
Personal problems	7
Temporarily too busy	4
Disliked survey matter	3
Anti-government	3
Concerns about confidentiality	2
Put off by record keeping	2
About to go away	1
No reason given[1]	1
Refusal to HQ after interviewer's visit	1
Bad experience with previous surveys	0
Late contact - insufficient field time	0
Total	**100**

[1] Households coded to 'no reason given' consist mainly of households that made refusals directly to HQ and were therefore not visited by an interviewer

Characteristics of non-responding households

Since April 1995 the FES/EFS/LCF has routinely collected information about non-responding households using a short non-response questionnaire (NRQ). The questions cover basic information about the number, age and sex of household members and other household information such as tenure and type of accommodation.

A full report on the quality of NRQ data, and a comparison of the characteristics of responding and non-responding households, was compiled for the 1995/96 FES. The tables in this section provide an update of selected information in that report, including a comparison on some key variables for responding and refusing households.

Interviewers collect information from households that refuse to take part before or during the interview, or at households where a resident is incapable of completing the interview. They also collect a limited amount of information about households at which contact was not made. Interviewers obtain the majority of this information from a household member(s). The remainder of this information comes from neighbours and from observation. It is not always possible to collect details about a refusing household. Therefore, the characteristics of non-responding households that interviewers are able to collect information about may be different from non-responding households where the interviewer is unable to collect these details.

Table 5.10 compares the distribution of household type for responding and non-responding households for 2015/16. Two categories of household type had considerably different representation between the responding and non-responding groups. Household type 'one adult, no children' contributed 40% to the non-responding group but 27% to the responding group. Household type 'two adults, with children' contributed 14% to the non-responding group but 19% to the responding group.

Table 5.10 Comparison of household type of non-responding and responding households, 2015/16

Great Britain

Household type	Non-responding households	Responding households
	Percentage of households	
1 adult, no children	40	27
1 adult, with children	6	4
2 adults, no children	31	36
2 adults, with children	14	19
3 or more adults, no children	8	10
3 or more adults, with children	2	4
All	**100**	**100**
Total number of households	**2,180**	**4,760**

Note: The sum of component items may not sum to the total due to rounding
[1] Non-contacts are all non-contacts/non-response

Table 5.11 compares non-responding and responding households by the number of adults and children in the household. The percentage of households containing only one adult was higher among the non-responding households (40%) than responding households (32%). Non-responding households were more likely to contain no children than responding households (79% compared with 72%).

Table 5.11 Comparison of number of adults and children in non-responding and responding households, 2015/16
Great Britain

	Non-responding households	Responding households
Number of adults	Percentage of households	
1	40	32
2	51	55
3	6	10
4 or more	3	4
All	**100**	**100**
Total number of households	**2,641**	**4,760**
Number of children	Percentage of households	
0	79	72
1	10	13
2	8	11
3	2	3
4 or more	1	1
All	**100**	**100**
Total number of households	**2,245**	**4,760**

Note: The sum of component items may not sum to the total due to rounding

The non-response questionnaire (NRQ) also collects basic demographic information about the HRP. Table 5.12 shows the age group and sex of the HRP among non-responding and responding households. Usually, households that did not take part in the survey tend to have similar age and sex profiles to those households that did respond. However, in 2015/16, we saw that a greater proportion of non-responding households had female household reference persons or household reference persons in the 16 to 34 age group when compared to responding households.

Table 5.12 Comparison of age group and sex of HRP in non-responding and responding households, 2015/16
Great Britain

Age group	Non-responding households	Responding households
	Percentage of households	
16 to 34	21	15
35 to 59	44	47
60 or more	36	38
All	**100**	**100**
Total number of households	**2,461**	**4,760**
Sex	Percentage of households	
Male	55	61
Female	45	39
All	**100**	**100**
Total number of households	**2,608**	**4,760**

Note: The sum of component items may not sum to the total due to rounding

Table 5.13 shows the accommodation type of non-responding and responding households. As information on accommodation could be gathered by observation, a further breakdown of non-response by refusal and non-contact is also shown in the table.

The accommodation type profiles of refusing and responding households were similar.

However, there were considerable differences between non-contacted households and refusing or responding households. Households that could not be contacted were more likely to include those living in purpose built flats or maisonettes (30% compared with 16% for refusing households and 14% for responding households). Non-contacted households were also more likely to include those living in converted or shared accommodation (7% compared with 3% for refusing households and 3% for responding households). Non-contacted households were less likely to live in detached houses or bungalows than refusing or responding households (12% compared with 21% and 26% respectively) and less likely to live in semi-detached houses or bungalows (19% compared with 30% of refusing households and 30% of responding households).

Table 5.13 Accommodation type of non-responding households, 2015/16

Great Britain

Type of accommodation	Non-responding households		Responding households
	Refusal	Non-contact	
	Percentage of households		
Detached house or bungalow	21	12	26
Semi-detached house or bungalow	30	19	30
Terraced house or bungalow	29	32	28
Purpose built flat or maisonette	16	30	14
Converted/shared accommodation	3	7	3
Other	1	0	1
All	**100**	**100**	**100**
Total number of households	**3,931**	**848**	**4,760**

Note: The sum of component items may not sum to the total due to rounding

Data processing

Introduction

Data collected from both responding and non-responding households are returned to the ONS Titchfield office on a regular basis throughout the reporting period.

Completed diaries are posted back to ONS Titchfield to the coding and editing team. Once received coders key each item of expenditure electronically using the Blaise instrument. Data from completed interviews are electronically transmitted to the coding and editing team. The editing team then code, edit and impute the interview data and ensure internal consistency for each case received. Once coding and editing is complete further quality assurance checks are carried out by the LCF survey team in Newport prior to the calculation of derived variables and the production of the LCF datasets. The data are then weighted and final datasets produced on a quarterly and annual basis. Interim monthly datasets are compiled and quality assured before being delivered to Defra.

Diary coding

Items of expenditure recorded in the LCF diaries are coded and keyed into a Blaise instrument. Computer-assisted coding (CAC) is used to assign a 3-level (5-digit) expenditure code.

The LCF uses the expenditure classification system COICOP (classification of individual consumption by purpose), published by the United Nations Statistics Division. COICOP has been adapted to the needs of household budget surveys (HBS) across the EU and, as a consequence, is compatible with the classifications used in national accounts and consumer price indices. This compatibility allows the production of indicators that are comparable Europe-wide, such as the harmonised indices of consumer prices (computed for all goods as well as sub-categories such as food and transport).

The codes are hierarchical in structure, nesting within 12 major (first level) categories. Codes are usually assigned by typing in a brief description of the item (which will bring up a display of matching items in the coding dictionary) with the corresponding codes. The coder then selects the best match. Hierarchical coding is also used for take-away meals and food eaten out of the home.

Food items are coded to a more detailed level than the standard COICOP permits. This enables Defra to carry out nutritional analysis. These detailed codes are then collapsed into the COICOP food codes for other customers.

For example, bread is originally coded to eight different bread codes, such as sliced white, unsliced white, wholemeal, etc. These codes are combined to form one single bread code in the COICOP coding frame.

Checks on the diary

Checks on range and consistency are also included in the Blaise instrument for the LCF diary. At the coding stage there are no checks between interview and diary data, these are applied at the editing stage. However, coders have access to selected items of questionnaire data which are printed on a fact sheet for each household. These include facts on household composition; type of school attended by children in the household; and the economic activity of adults in the household.

Coders also check on the completeness of data i.e. that each item of expenditure is coded to one of the coding categories and that the cost of each item is recorded. At this stage coders may visit the websites of retailers and manufactures to clarify incomplete diary information.

In a small proportion of cases, respondents may record the type of goods bought and a global amount spent. The coding supervisors then impute values for each individual item listed.

Further checks on food codes are carried out by the coding supervisors to examine the processing of food types known to have been problematic in the past e.g. that all fish items are coded to the correct fresh, frozen or fish product code.

Interviews: edit, imputation and coding

Completed questionnaires for each household are edited in Titchfield using Blaise. Editors carry out a series of checks to ensure the internal consistency of individual cases. These checks are detailed below.

Imputing missing values

Missing values can occur when respondents are unable to provide an answer. Missing data can be imputed in several ways:

- by reference to tables based on external (non-LCF) data published elsewhere; for example, mortgage imputation tables based on interest rates and the amount of a loan; and tables and rules on eligibility to state benefits
- by reference to tables based on LCF data from previous years showing average amounts according to household income

- by using information collected elsewhere in the questionnaire or by referring back to the interviewers

Resolving other problems

Editors respond to all notes and comments recorded in the questionnaire by interviewers suggesting changes to recorded answers. If editors cannot resolve a check from the notes given, they will refer the question to the LCF research team. A decision will then be made based upon existing instructions, experience and precedence.

Editors also check each occurrence of period codes 95 (One off /lump sum) and 97 (None of these). These may be valid codes when collecting the data; however, they are not acceptable in the final data set.

Abatement for business expenses

Generally any respondent who is self-employed will be able to offset business expenditure against income tax. As the LCF is intended to cover personal expenditure only, the amounts recorded in the questionnaire and diary for these items of expenditure need to be abated, this is done manually by the editors using information on business expenses.

Abatement is also carried out where employees receive business expenses. Vehicle expenses (in the household part of the questionnaire and in the diary) are abated if the respondent receives a mileage / fixed car allowance in their pay. Editors also use information on business refunds recorded in the refunds section of the questionnaire.

Abatement of self-employment income

Any household expenses claimed must relate to the sampled address only and must be a valid household expenditure for that household. The editors will abate the relevant expenditure item by the percentage claimed unless an amount is given instead of a percentage or if 100% is claimed.

The sections in the household questionnaire that can be abated are:
- telephone payments
- fuel payments
- rent
- mortgage payments
- structural insurance payments
- loans on vehicles

- council tax payments
- rates (NI)
- water rates
- vehicle – tax and insurance

Records of editing actions

Abatement markers are included at relevant questions throughout the interview, e.g. telephone and electricity payments. Editors set the appropriate marker to the value 1 if the item has been abated to allow for business expenditure.

Forty similar markers are included to record whether values at some questions or groups of questions were imputed or amended; this gives a broad indication of the amount of imputation carried out.

Coding within the questionnaire

Coding of selected expenditure items in the questionnaire is carried out by office-based editors in Titchfield using computer-assisted coding (CAC). Items include loans, credit payments, standing orders/direct debits and deductions from salary.

Interviewers code standard items in the LCF questionnaire such as three digit SOC (standard occupational classification), and SIC (standard industrial classification). Social class and socio-economic group are automatically derived from the SOC and employment status codes.

Imputation of a diary case

Although LCF response is generally based on complete households responding, there are areas where missing information can be imputed. Apart from specific missing values imputed on a case by case basis by editors, the LCF also accepts households with missing diaries, as long as the diary of the main diary keeper (MDK) is present. The MDK is defined as the person who does most of the shopping in the household. Diaries which are missing will be imputed, that is they will receive the diary data from a person in another responding household with matching characteristics of age, employment status and relationship to the HRP.The first step in the diary imputation process involves scoring each person in the pool of potential donors for suitability as a match for the person with a missing diary.

The scoring system is:
- matching age = 8 points
- matching relationship to the HRP = 4 points
- matching employment status = 2 points
- matching survey month = 1 point

In the next stage of the process the potential donor with the highest score is selected and the diary data from the donor is copied to the receiving person. To be used as a donor, a diary must achieve a minimum score of 8 points.

Missing child diaries do not affect the response status of a household, therefore if a child's diary is missing; the case is still counted as a full interview. In 2015/16, 170 households had imputed diaries, accounting for 3% of responding households.

Variables that indicate whether or not a diary has been imputed, and the number of diaries imputed per household, are included in the LCF datasets.

Research checks

Once edited and coded, systematic checks are applied to the aggregated data to ensure consistency between diaries and interviews and to examine the processing of food types known to have been problematic in the past e.g. the appropriate coding of fish or bread.

On completion of the food code checks by coding supervisors, further checks are made by the LCF business operations and research staff. Approximately 50 checks are applied to aggregate datasets using SPSS. These include checks to identify missing shop codes for items of food expenditure; entries where the unit costs are too high or too low; types of expenditure coded to inappropriate shop codes and; individual items costing more than £5,000.

A short series of checks are also made at this stage to ensure consistency between household, person and diary files.

Users of the data within ONS and Defra, the sponsors of the specialist food data, also contribute to the checking of diary and interviewer data as it is processed.

Quality project

The LCF undergoes continuous improvement. The processes employed by the survey are reviewed regularly to ensure that the survey remains up-to-date and retains high data-quality.

As an example of the LCF's continuous improvement, a Lean Six Sigma (LSS) project was successfully completed and implemented; this examined the quality assurance process of the monthly data files produced for Defra. The aim of the project was to reduce the resource required to complete the checking while maintaining a process with an appropriately defined level of quality. The results of the project greatly increased the efficiency of data checking and improved data quality.

Calculation of derived variables (DVs)

Raw and derived datasets are supplied to customers. Raw data are collected/calculated during the interview/diary-keeping period, to the point of coding and editing. Derived data are calculated from the raw and other derived data.

Table 6.1 shows the types of derived variables on the LCF datasets. Over 9,000 raw and derived variables are produced for the LCF.

Table 6.1 Derived table definitions

Name of DV dataset	DV Description	DV level
Dvhh	Household characteristics and expenditure	Household
Dvper	Household members data	Person
Dvadult_set89	Total weekly expenditure by item for each adult spender	Item
Dvchild_set89c	Total weekly expenditure by item for each child spender	Item

Anonymised data

A guarantee is given to LCF respondents that their answers will be treated in confidence and that no information about individuals or households will be made available to data users. Therefore, as a precaution when releasing microdata certain variables, which could lead to the disclosure of the identity of a household are anonymised. This means that the values stored for these variables are adjusted in some way, e.g. by banding, top-coding, rounding.

Fields that could aid the identification of an individual may also be removed. Any variable suffixed with the letter P in the dataset has been anonymised.

Weighting

Since the survey year ending March 1999, the survey has been weighted to reduce the effect of non-response bias. The weights are produced in two stages. First, the data are weighted to compensate for non-response (sample-based weighting). Second, the sample distribution is weighted so that it matches the population distribution in terms of region, age group and sex (population-based weighting).

Sample-based weighting using the Census

The decennial Census was found to be the most appropriate source of information about non-responding households. Unlike the LCF, which relies upon voluntary co-operation from respondents, the Census is mandatory therefore non-response is kept to a minimum. From 1998/99 to 2006 the FES/EFS used results from the 1991 Census-linked study of non-respondents to carry out non-response weighting[9]. From 2007 the non-response classes and weights have been updated using 2001 Census-linked data.

The Census-linked studies matched Census addresses with the sampled addresses of some of the large continuous surveys, including FES for the 1991 link study and EFS/LCF for the 2001 link study. In this way it was possible to match the address details of the respondents as well as the non-respondents with corresponding information gathered from the Census for the same address. The information collected during the 1991 and then the 2001 Census/FES/EFS/LCF matching work was then used to identify types of households that were being under-represented in the survey.

For the 1991 Census based non-response weights a combination of household variables were analysed using the software package AnswerTree (using the chi-squared statistics CHAID)[10] to identify which characteristics were most significant in distinguishing between responding and non-responding households. These characteristics were sorted by the program to produce ten weighting classes with different response rates. For the updated 2001 Census based non-response weights, a combination of household

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[9] See Foster, Kate (1994) *Weighting the FES to compensate for non-response, Part 1: An investigation into Census-based weighting schemes*, London: OPCS

[10] CHAID is an acronym that stands for chi-squared automatic interaction detection; it uses chi-squared statistics to identify optimal splits or groupings of independent variables in terms of predicting the outcome of a dependent variable, in this case response

variables were analysed using a mixed model approach. The mixed model is a combined approach to modelling, to benefit from the underlying statistical model of logistic regression as well as utilising AnswerTree. Updated weighting classes were produced, using this analysis, to further improve non-response weighting from 2007. The results of the 2011 Census-linked studies will be used to further update non-response weighting in due course.

Households within each of the weighting classes were assigned an updated non-response weight as shown in Table 6.2 below.

Table 6.2 2001 based non-response classes

Level 1 split	Level 2 split	Level 3 split	Weight class	Scaled non-response weight
Pensioners in the household (given age and sex)	**Region**	**Number of cars**		
Not pensioners 1 person, female 60-74 2 or more persons, all pensioners under 75 2 or more persons, all pensioners, at least 1 75+	North East North West East Midlands West Midlands South East	None	1	1.021
		One or more	2	0.899
	Merseyside Yorkshire & Humberside Eastern Wales Scotland	-	3	1.006
	London	**Household composition**		
		1 person 2 adults only 2 adults and 3 or more children 3 or more adults and 1 or more children 3 or more adults only	4	1.172
		1 adult and 1 or more children 2 adults and 1 or 2 children	5	0.886
	South West		6	0.859
	HRP of pensionable age			
1 person, female 75-84 2 or more persons, only 1 non-pensioner	No	-	7	0.963
2 or more persons where 2 or more are non-pensioners	Yes	-	8	1.204
1 person, female 85+	-	-	9	1.690

Population-based weighting

The second stage of the weighting adjusts the non-response weights so that weighted totals match population totals. As the LCF sample is based on private households, the population totals used in the weighting need to relate to people living in private households. The population totals used are the most up-to-date official figures available; from 2006 to 2012, these totals were population projections based on estimates rolled forward from the 2001 Census; from 2013 updated population totals based on Census 2011 data were used. Population totals adjusted precisely to harmonise with the LCF definition of a private household were introduced for 2011. These estimates used exclude residents of institutions not covered by the EFS/LCF, such as those living in bed-and-breakfast accommodation, hostels, residential homes and other institutions.

The population information and LCF data were grouped into twenty age by sex categories within twelve region categories to form weighting classes as shown in Table 6.3. The existing non-response weights were then calibrated[11] so that weighted totals matched population totals, for males and females in different age groups and for regions. An important feature of the population-based weighting is that it is done by adjusting the factors for households not individuals.

The weighting is carried out separately for each quarter of the survey. The main reason is that sample sizes vary slightly from quarter to quarter. Quarterly weighting counteracts any potential bias from the uneven spread of interviews through the year.

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[11] Implemented by GES

Table 6.3 Weighting classes used for population-based weighting

Age/sex	Region
0 to 4	North East
5 to 9	North West
10 to 15	Yorkshire and the Humber
16 to 19, male	East Midlands
20 to 24, male	West Midlands
25 to 29, male	Eastern
30 to 44, male	London
45 to 54, male	South East
55 to 64, male	South West
65 to 74, male	Wales
75 or over, male	Scotland
16 to 19, female	Northern Ireland
20 to 24, female	
25 to 29, female	
30 to 39, female	
40 to 49, female	
50 to 59, female	
60 to 69, female	
70 to 79, female	
80 or over, female	

Effects of weighting on the data

Table 6.4 shows the effects of weighting by comparing un-weighted and weighted data for 2015/16. Weighting decreased the estimate of total average expenditure by £6.42 a week. It had the largest absolute impact on average weekly expenditure on recreation and culture, decreasing the estimate by £3.78 (5.3%). It increased the estimate of spending on housing, fuel and power by 5.5%. It reduced the estimate of spending on health by 4.6%, miscellaneous by 3.6% and the estimate for transport by 2.4%.

Table 6.4 The effect of weighting on expenditure data, 2015/16

United Kingdom

Commodity or service	Average weekly household expenditure (£)		Absolute difference	Percentage difference
	Unweighted	Weighted as published		
All expenditure groups	**461.80**	**455.30**	**-6.42**	*-1.4*
Food and non-alcoholic drinks	58.00	56.80	-1.13	*-1.9*
Alcoholic drink, tobacco & narcotics	11.60	11.40	-0.26	*-2.3*
Clothing and footwear	23.50	23.50	-0.07	*-0.3*
Housing, fuel and power	68.70	72.50	3.75	*5.5*
Household goods and services	36.30	35.50	-0.88	*-2.4*
Health	7.60	7.20	-0.35	*-4.6*
Transport	74.60	72.70	-1.82	*-2.4*
Communication	15.90	16.00	0.09	*0.5*
Recreation and culture	71.80	68.00	-3.78	*-5.3*
Education	7.20	7.00	-0.13	*-1.8*
Restaurants and hotels	45.50	45.10	-0.34	*-0.8*
Miscellaneous	41.20	39.70	-1.50	*-3.6*

Adjustments for outliers

Unusually high expenditure and income values (termed statistical outliers) are investigated to confirm the accuracy of the recorded data. The values are examined for their effect on total income and expenditure estimates for Great Britain.

The 2015/16 LCF used the 'surprise outlier approach' to deal with outliers. This technique effectively reduces the impact of the outlying value without deleting it altogether. The approach treats each outlier as if it were the only extreme unit in the stratum population. Consequently the weight for units in the outlier's selection stratum must be recalculated, as the population and sample size have effectively been reduced by one. This has the effect that the other population units which have been represented by the outlier are now represented by the average of the other units in the stratum. Therefore, the choices of treatments for a suspected outlier (using the surprise outlier approach) are either for it to represent all of the units it would normally

represent, or to represent no units other than itself. The LCF gives the outlying case a weight of one - as though sampled from a stratum of size one.

Equivalisation methodology

Equivalisation is a standard way of adjusting household income to take into account the different financial needs of different types of households. After equivalisation has been applied, households with the same equivalised income can be said to have a comparable standard of living.

We use the OECD (Organisation for Economic Co-operation and Development) modified equivalence scale. This is the standard scale for the Statistical Office of the European Union (Eurostat). This method adjusts household income to reflect the different resource needs of:

- single adults

- any additional adults in the household

- children in various age groups

The equivalisation method works as follows:

- each member of the household is first given an equivalence value

- the equivalence values for each household member are summed to give a total equivalence number for the household

- the total income for the household is divided by the equivalence value.

The modified OECD equivalence values are shown below.

Type of Household Member	Equivalence value
First adult	1.0
Additional adult	0.5
Child aged: 14 and over	0.5
Child aged: 0-13	0.3

Worked Example

Consider a household with two adults and two small children who have an income of £60,000 per year. The household equivalisation value will be 1+0.5+0.3+0.3 = 2.1. This shows that the household needs more than twice the income of a single adult household in order to achieve a comparable standard of living. Their equivalised income is £60,000/2.1 = £28,571.43.

Therefore, this household is comparable to a one adult household with an income of £28,571.43.

Equivalised household incomes were calculated for each household using the above method. Household equivalised incomes were then ranked in ascending order and divided into 10 equally-sized (decile) groups. Households with the lowest equivalised income make up the first decile group. The income decile groups are shown below:

Income Decile	Disposable weekly income	Equivalised disposable weekly income (OECD-modified scale)
1	Up to £194	Up to £156
2	£195 to £283	£157 to £206
3	£284 to £360	£207 to £253
4	£361 to £443	£254 to £298
5	£444 to £533	£299 to £344
6	£534 to £642	£345 to £399
7	£643 to £768	£399 to £463
8	£769 to £923	£464 to £550
9	£924 to £1,211	£551 to £692
10	£1,212 and over	£693 and over

Standard errors

Introduction

This chapter looks at sources of errors in surveys and describes how standard errors are calculated.

Sources of error in surveys

The Living Costs and Food Survey (LCF) is a sample of households and not a census of the whole population. Therefore, the estimates presented in this report will differ, to some degree, from the true population values. The total error in a survey estimate is the difference between the estimate derived from the data collected and the true value for the population. The total error can be divided into two main types: systematic and random error.

Systematic error

Systematic error, or bias, covers those sources of error which will not average to zero over repeats of the survey. Bias may occur, for example, if a certain section of the population is excluded from the sampling frame, because non-respondents to the survey have different characteristics to respondents, or if interviewers systematically influence responses in one way or another. Substantial efforts are made to avoid systematic errors.

Random error

An important component of random error is sampling error, which is the error that arises because the estimate is based on a random sample rather than a full census of the population. The results obtained for any single sample may, by chance, vary from the true values for the population but the variation would be expected to average to zero over many repeats of the survey. The amount of variation depends on the size and design of the sample and how widely the categories of expenditure (or income) vary between households. Sampling error is smallest for the average expenditure of large groups of households on items purchased frequently and when the level of spending does not vary greatly between households. Conversely it is largest for small groups of households, and for items purchased infrequently or for which expenditure varies considerably between households.

Random error may also result from other sources such as random variations in respondents' interpretation of the questions, or variations in the way different interviewers ask questions. Efforts are made to minimise these effects through pilot work and interviewer training.

Calculating standard errors (simple method)

Unlike non-sampling errors, it is possible to estimate the size of sampling error by calculating the standard error associated with the survey estimates. The standard error (se) of mean $(\overline{X})$, based on a simple random sample of size *n,* is calculated by the formula,

$$se\left(\overline{X}\right)_{srs} = \sqrt{s^2\Big/n} \quad \textit{(under sampling with replacement)}$$

where s^2 = sample variance.

The LCF uses a multi-stage stratified sample design. In considering the reliability of estimates, standard errors calculated on the basis of a simple random sample design will not reflect the true variation because of the complex sample design. The two-stage sample of addresses can lead to a substantial increase in standard error if the households or individuals within primary sampling units (PSUs) are relatively homogeneous but the PSUs differ from one another. Stratification tends to reduce sampling error and is of most advantage where the stratification factor is strongly related to characteristics of interest in the survey.

Standard errors for complex sample designs (full method)

Because of the complexity of the LCF sample, the size of the standard error depends on how the characteristic of interest is spread within and between the PSUs and strata, and this is taken into account in the way data are grouped in order to calculate the standard error. The method for estimating a standard error sums the squared differences (in the characteristic of interest) between totals for adjacent PSUs. The ordering of PSUs reflects the ranking of postal sectors on the stratifiers used in the sample design in order to capture the benefit of stratification.

The method for calculating complex standard errors for the weighted estimates used on this survey is quite complex. First, methods that take account of the clustering, stratification and differential sampling (and initial non-response weights) used in the design are applied. These are then modified to allow for the calibration weighting used on the survey.

Standard errors of a mean or proportion

This method explicitly allows for the fact that the percentages and means are ratios of two survey estimates: the number with the characteristic of interest is the numerator (*y*) and the sample size is the denominator (*x*), both of which

are subject to random error. The formula used to estimate the variance of a ratio estimator (r, where $r = y / x$) is shown below.

$$var\ (r)=1/x^2[var(y) + r^2 var\ (x) - 2r\ cov(y,x)]$$

Var(r) is the estimate of the variance of the ratio, r, expressed in terms of var(y) and var(x) which are the estimated variances of y and x, and cov(y,x) which is their estimated covariance. The resulting estimate is only valid if the denominator is not too variable.

Standard errors of a total

To calculate the standard error of a total, consecutive PSUs are first grouped into pairs or triples, at the end of a regional stratum. The standard error of a weighted total is estimated by:

$$sedes = \sqrt{\sum_h \frac{k_h}{k_h-1}\sum_i (x_{hi} - \bar{x}_h)^2}$$

where h denotes the stratum (PSU pairs or triples), k_h is the number of PSUs in the stratum h (either 2 or 3), the x_{hi} is the weighted total in PSU i and the $\bar{x}_h$ is the mean of these totals in stratum h.

Further details of this method of estimating sampling errors are described in *A Sampling Errors Manual* (B Butcher and D Elliot, ONS 1987).

The effect of the calibration weighting is calculated using a jackknife linearisation estimator. It uses the formula given above but with each household's expenditure, x_r, replaced by a residual from a linear regression of expenditure on the number of people in each household in each of the region and age by sex categories used in the weighting.

The formula has been expressed in terms of expenditures on a particular item, but of course it can also be applied to expenditures on groups of items, commodity groups and incomes from particular sources.

Design factors

The design factor, or deft, is the ratio of the standard error associated with an estimate to the standard error that would have resulted had the survey design been a simple random sample of the same size.

$$deft(\overline{X}) = se(\overline{X}) / se_{srs}(\overline{X})$$

The size of the design factor varies between survey variables according to the degree to which a characteristic is clustered within PSUs, or is distributed between strata, and the impact of the weighting. For a single variable, the size of the factor also varies according to the size of the subgroup on which the estimate is based and on the distribution of the subgroup between PSUs and strata. Design factors below 1.0 show that the standard errors associated with the complex sample design are lower than those associated with the simple random sample, probably due to the benefits of stratification. Design factors greater than 1.0 show less reliable estimates than might be gained from a simple random sample, due to the effects of clustering and weighting.

The formula to calculate the standard error of the difference between two means for a complex sample design is:

$$se(\overline{X}_1 - \overline{X}_2) = \sqrt{\left[deft_1^2 \left(s^2 / n_1 \right) + deft_2^2 \left(s^2 / n_2 \right) \right]}$$

where $\overline{X}_1$ and $\overline{X}_2$ are observed means for the two subsamples and n_1 and n_2 are the subsample sizes.

Standard errors for the LCF

Standard errors for detailed expenditure items are presented in relative terms in Table A1 (standard error as a percentage of the average to which it refers). The calculation of full standard errors is complex and as a result Table A1 in Family Spending is the only table in which standard errors are shown.

The following tables, Tables 7.1 and 7.2, indicate the effect of calculating full standard errors instead of those that would have been calculated had the survey used a simple random sample. The design factor (DEFT), is also displayed. As a ratio of the two standard errors, DEFT acts as a measure of the efficiency of the survey's sample design.

Table 7.1   Percentage standard errors of expenditure of households and number of recording households, 2015/16

United Kingdom

Commodity or service	Weighted average weekly household expenditure (£)	Percentage standard error Simple method	Design factor (DEFT)	Percentage standard error Full method	Households recording expenditure Recording households in sample	Percentage of all households
All expenditure groups	**455.30**	*1.1*	1.1	*1.2*	**4,916**	*100*
Food and non-alcoholic drinks	56.80	*0.9*	1.0	*0.9*	4,889	*99*
Alcoholic drink, tobacco and narcotics	11.40	*2.4*	0.9	*2.3*	3,007	*61*
Clothing and footwear	23.50	*2.6*	1.1	*2.8*	3,222	*66*
Housing, fuel and power	72.50	*1.4*	1.2	*1.7*	4,910	*100*
Household goods and services	35.50	*3.6*	1.1	*4.1*	4,563	*93*
Health	7.20	*9.3*	0.9	*8.5*	2,608	*53*
Transport	72.70	*2.1*	1.0	*2.0*	4,342	*88*
Communication	16.00	*1.2*	1.0	*1.2*	4,748	*97*
Recreation and culture	68.00	*2.4*	0.9	*2.2*	4,853	*99*
Education	7.00	*15.8*	0.9	*14.1*	265	*5*
Restaurants and hotels	45.10	*2.2*	1.0	*2.3*	4,340	*88*
Miscellaneous goods and services	39.70	*2.4*	1.0	*2.3*	4,814	*98*

Source: Office for National Statistics

Figures have been deflated to 2015/16 prices using the Consumer Prices Index (CPI), using indices specific to each major COICOP category. This is with the exception of specific items to which the CPI is not applicable: for mortgage interest payment and council tax payments the Retail Prices Index (RPI) was used. For the deflated figures using the CPI, standard errors have been calculated. These were calculated using the formula below to enable testing of statistical significance.

$$SE(uplift \times estimate_{previous\ year}) = uplift \times SE(estimate)_{previous\ year}$$

$$where\ uplift = \frac{1}{\dfrac{deflator}{100}}$$

Significance testing

Statistical significance testing indicates the probability with which we are confident that the difference between the estimates under examination did not occur by chance. Unless stated, all significance referred to is at the 95% level. This means the probability that the difference happened by chance is low (1 in 20).

Independent two sample t-tests were used for the significance testing. The method of calculation is as follows:

Let n_i be the total number of households in the sample in the ith year, $\bar{x}_i$ the average expenditure per household for a commodity/service group for the ith year and s_i^2 is the standard deviation for a commodity/service group for the ith year. Then the formula used for significance testing, is given by:

$$\frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}} \sim t_v\ where\ v = \frac{\left(\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}\right)^2}{\dfrac{\left(\dfrac{s_1^2}{n_1}\right)^2}{n_1 - 1} + \dfrac{\left(\dfrac{s_2^2}{n_2}\right)^2}{n_2 - 1}}$$

Confidence intervals

The estimate produced from a sample survey will rarely be identical to the population value, but statistical theory allows us to estimate the precision associated with any survey result. The standard error can be estimated from the values obtained for the sample and allows the calculation of confidence intervals which indicate the range of random variation in the survey estimates.

It is common when quoting confidence intervals to refer to the 95% confidence interval around a survey estimate. This is calculated at 1.96 times the standard error on either side of the estimated percentage or mean since, under a normal distribution, 95% of values lie within 1.96 standard errors of the mean value. If it were possible to repeat the survey under the same

conditions many times, 95% of these confidence intervals would contain the population values.

$$\overline{X} \pm 1.96 * se(\overline{X})$$

The following table, Table 7.3, presents the 95% confidence intervals for the main expenditure categories.

Table 7.2   95% confidence intervals for average household expenditure, 2015/16

United Kingdom

Commodity or service	Weighted average weekly household expenditure (£)	95% confidence interval	
		Lower limit	Upper limit
All expenditure groups	**455.30**	**444.50**	**466.20**
Food and non-alcoholic drinks	56.80	55.80	57.90
Alcoholic drink, tobacco and narcotics	11.40	10.90	11.90
Clothing and footwear	23.50	22.10	24.80
Housing, fuel and power	72.50	70.00	74.90
Household goods and services	35.50	32.60	38.30
Health	7.20	6.00	8.40
Transport	72.70	69.80	75.70
Communication	16.00	15.60	16.40
Recreation and culture	68.00	65.00	70.90
Education	7.00	5.10	9.00
Restaurants and hotels	45.10	43.10	47.10
Miscellaneous goods and services	39.70	37.80	41.50

The 95% confidence interval for the difference between two means is then given by:

$$(\overline{X_1} - \overline{X_2}) \pm 1.96 * se\,(\overline{X_1} - \overline{X_2})$$

If this confidence interval includes zero, then the hypothesis that the two means are the same and the observed difference is due to chance alone is not rejected. If the interval does not include zero then it is unlikely (less than 5% probability) that the observed difference could have occurred by chance and this constitutes a 'significant difference' at the 95% confidence level.

Glossary of terms

Definitions

Major changes in definitions since 1991 are described in the following section. Changes to definitions made prior to 1991 can be found in earlier editions of Family Spending.

Household

A household comprises of o*ne person living alone or a group of people (not necessarily related living at the same address):*
- share cooking facilities, and
- share a living room or sitting room or dining area.

Resident domestic servants are included. The members of a household are not necessarily related by blood or marriage. As the survey covers only private households, people living in hostels, hotels, boarding houses or institutions are excluded. Households are not excluded if some or all members are not British subjects, but no attempt is made to obtain information from households containing members of the diplomatic service of another country or members of the United States armed forces.

Retired households

Retired households are those where the household reference person is retired. The household reference person is defined as retired if they have reached state pension age and are economically inactive. Since May 2010 the state pension age for women has been increasing gradually to be in line with the male pension age of 65 by 2018. Therefore, if for example a male household reference person is aged over 65 years of age, but working part-time or waiting to take up a part-time job, this household would not be classified as a retired household. For analysis purposes two categories are used in this report:

- 'A retired household mainly dependent upon state pensions' is one in which at least three-quarters of the total income of the household is derived from national insurance retirement and similar pensions, including housing and other benefits paid in supplement to or instead of such pensions. The term 'national insurance retirement and similar pensions' includes national insurance disablement and war disability pensions, and income support in conjunction with these disability payments.
- 'Other retired households' are retired households which do not fulfil the income conditions of 'retired household mainly dependent upon state pension' because more than a quarter of the households income derives from other sources. For example, occupational retirement pensions and/or income from investments, or annuities.

Household Reference Person (HRP)

From 2001–02 the concept of household reference person (HRP) was adopted on all government-sponsored surveys in place of head of household. The household reference person is the householder who:
• owns the household accommodation, or
• is legally responsible for the rent of the accommodation, or
• has the household accommodation as an emolument or perquisite, or
• has the household accommodation by virtue of some relationship to the owner who is not a member of the household.

If there are joint householders the household reference person will be the one with the higher income. If the income is the same, then the eldest householder is taken.

Members of household

In most cases members of co-operating households are easily identified as the people who satisfy the conditions in the definition of a household, above, and are present during the record-keeping period. However difficulties of definition arise when people are temporarily away from the households or spend their time between two residences. The following rules apply in deciding whether or not such persons are members of the household:
• Married persons living and working away from home for any period are included as members provided they consider the sampled address to be their main residence; in general, other people (e.g. relatives, friends, boarders) who are either temporarily absent or who spend their time between the sampled address and another address, are included as members if they consider the sampled address to be their main residence. However, there are exceptions which override the main residence rule:
• Children under 16 at boarding school are included as members.
• Children aged 16 or over who live away from home for purposes of either work or study and come home only for holidays are not included at the parental address, unless they are at home for all or most of the record-keeping period.
• Visitors staying temporarily with the household, and others who have been in the household for only a short time, are treated as members provided they will be staying with the household for at least one month from the start of record-keeping.

Household composition

A consequence of these definitions is that household compositions quoted in this report include some households where certain members are temporarily

absent. For example, 'two adults and children' households will contain a few households where one parent is temporarily away from home.

Adult
Persons aged 16 years and over are defined as adults, and as a result are asked the income questions. However, in the Family Spending report, persons who have reached the age of 18 or those who are married and under the age of 18 are classed as adults.

Children
Persons less than 16 years of age are classed as children. For the Family Spending report, persons who are under 18 years of age and unmarried are classed as children.

However, in the definition of clothing, clothing for people aged 16 years and over is classified as clothing for men and women; clothing for those aged 5 to 15 as clothing for boys and girls; and clothing for those under five as babies clothing.

Main diary keeper (MDK) (or main shopper)
The MDK is the person in the household who is normally responsible for most of the food shopping. This includes people who organise and pay for the shopping although they do not physically do the shopping themselves.

Rules for identifying the main diary keeper when the household cannot identify this for themselves:

Rule 1: Establish who in the household has the highest income.

Rule 2: If each household member has the same income then find out who is the oldest.

If a paid domestic servant normally performs these tasks then the MDK is the person responsible for seeing that the domestic servant does the shopping.

No address may be coded as a full or partial interview if the diary of the MDK is missing or incomplete.

Spender
Household members aged 16 and over, excluding those who for special reasons are not capable of keeping diary record-books, are described as spenders. It is unimportant whether or not the individual earns or spends

money. If a spender is absent for less than 7 days from the interviewers' initial contact, the interviewer can proceed with the interview.

Absent spender
If a spender is absent for longer than 7 days they are defined as an "Absent spender". Absent spenders do not keep a diary and consequently are not eligible for the voucher payment that is made to diary keepers.

Non spender
If a household member is completely incapable of contributing to the survey by answering questions or keeping a diary, then they are defined as a "Non Spender".

However, incapable people living on their own cannot be designated as non spenders as they comprise the whole expenditure unit. If this is the case, the interviewer should enlist the help of the person outside of the household who looks after their interests. If there is no one able or willing to help, the address should be coded as incapable.

Economically active
These are people aged 16 and over who fall into the following categories:
- **Employees at work** – those who at the time of interview were working full-time or part-time as employees or were away from work on holiday. Part-time work is defined as normally working 30 hours a week or less (excluding meal breaks) including regularly worked overtime.
- **Employees temporarily away from work** – those who, at the time of interview, had a job but were temporarily absent due to, for example, illness, temporary lay-off, or strike.
- **Government supported training schemes** – those participating in government programmes and schemes who, in the course of their participation, receive training such as Employment Training, and including those who are also employees in employment.
- **Self-employed** – those who, at the time of interview, said they were self-employed.
- **Unemployed** – those who, at the time of interview, were out of employment and have sought work within the last four weeks and were available to start work within two weeks, or were waiting to start a job already obtained.
- **Unpaid family workers** – those working unpaid for their own or a relative's business. In this report, unpaid family workers are included under economically inactive in analyses by economic status (Tables A17 and A5

of Family Spending, 2015/16) because insufficient information is available to assign them to an economic status group.

Economically inactive
- **Retired** – people who have reached national insurance retirement age and are not economically active. Since May 2010 the female state pension age has been gradually increasing to align with the male pension age of 65 by 2018.
- **Unoccupied** – people under national insurance retirement age who are not working, nor actively seeking work. This category includes certain self-employed people such as mail order agents and baby-sitters who are not classified as economically active.

National Statistics Socio-economic Classification (NS-SEC)
From 2001 the National Statistics Socio-economic Classification (NS-SEC) was adopted for all official surveys, in place of Social Class based on Occupation (SC) and Socio-economic Groups (SEG). NS-SEC is itself based on the Standard Occupational Classification 2010 (SOC2010) and details of employment status. Although NS-SEC is an occupation-based classification, there are procedures for classifying those not in work.

The main categories used for analysis in Family Spending are:
1   Higher managerial and professional occupations, sub-divided into:
1.1   Large employers and higher managerial occupations
1.2   Higher professional occupations
2   Lower managerial and professional occupations
3   Intermediate occupations
4   Small employers and own account workers
5   Lower supervisory and technical occupations
6   Semi-routine occupations
7   Routine occupations
8   Never worked and long-term unemployed
9   Students
10   Occupation not stated
11   Not classifiable for other reasons

The long-term unemployed are defined as those unemployed and seeking work for 12 months or more. Members of the armed forces, who were assigned to a separate category in social class, are included within the NS-SEC classification. Individuals that have retired within the last 12 months are classified according to their employment. Other retired individuals are assigned to the 'Not classifiable for other reasons' category.

Socio- economic classification (SE-SEC) regions
These are the same areas as UK regions and countries.

Urban and rural areas
This classification introduced in 2005/06 replaces the previous Department for Transport, Local Government and the Regions (DTLR) 1991 Census-based urban and rural classification, which was used in previous editions of Family Spending. The new classification is applied across Great Britain and is an amalgamation of the Rural and Urban Classification 2004 for England and Wales and the Scottish Executive Urban Rural Classification. These classifications are based on 2001 Census data and have been endorsed as the standard National Statistics Classifications for identifying urban and rural areas across GB. In broad terms, an area is defined as urban or rural depending on whether the population falls inside a settlement of 10,000 or more. For further details concerning these classifications please refer to the Rural/Urban Definition and LA Classification on the Office for National Statistics (ONS) website.

Expenditure
Any definition of expenditure is to some extent arbitrary, and the inclusion of certain types of payment is a matter of convenience or convention depending on the purpose for which the information is to be used. In the tables in this report, total expenditure represents current expenditure on goods and services. Total expenditure, defined in this way, excludes those recorded payments that are really savings or investments: for example, purchases of national savings certificates, life assurance premiums, and contributions to pension funds. Similarly, income tax payments, national insurance contributions, mortgage capital repayments and other payments for major additions to dwellings are excluded. Expenditure data are collected in the diary record-book and in the household schedule. Informants are asked to record in the diary any payments made during the 14 days of record-keeping, whether or not the goods or services paid for have been received. Certain types of expenditure which are usually regular though infrequent, such as insurance, licences and season tickets, and the periods to which they relate, are recorded in the household schedule as well as regular payments such as utility bills.

The cash purchase of motor vehicles is also entered in the household schedule. In addition, expenditure on some items purchased infrequently (thereby being subject to high sampling errors) has been recorded in the household schedule using a retrospective recall period of either 3 or 12 months. These items include carpets, furniture, holidays and some housing costs. In order to avoid duplication, all payments shown in the diary record-

book which relate to items listed in the household or income schedules are omitted in the analysis of the data, irrespective of whether there is a corresponding entry on the latter schedules. Amounts paid in respect of periods longer than a week are converted to weekly values.

Expenditure tables in this report show the 12 main commodity groups of spending and these are broken down into items which are numbered hierarchically (see 'Changes to definitions, 1991 to 2011' which details a major change to the coding frame used from 2001/02). Table A1 of Family Spending, 2015/16 shows a further breakdown in the items themselves into components which can be separately identified. The items are numbered as in the main expenditure tables, and the average weekly household expenditure and percentage standard error is shown against each item or component.

Qualifications which apply to this concept of expenditure are described in the following paragraphs:

- **Goods supplied from a household's own shop or farm**
  Spenders are asked to record and give the value of goods obtained from their own shop or farm, even if the goods are withdrawn from stock for personal use without payment. The value is included as expenditure.

- **Hire purchase and credit sales agreements, and transactions financed by loans repaid by instalments**
  Expenditure on transactions under hire purchase or credit sales agreements, or financed by loans repaid by instalments, consists of all instalments that are still being paid at the date of interview, together with down payments on commodities acquired within the preceding three months. These two components (divided by the periods covered) provide the weekly averages which are included in the expenditure on the separate items given in the tables in this report.

- **Club payments and budget account payments, instalments through mail order firms and similar forms of credit transaction**
  When goods are purchased by forms of credit other than hire purchase and credit sales agreement, the expenditure on them may be estimated either from the amount of the instalment which is paid or from the value of the goods which are acquired. Since the particular commodities to which the instalment relates may not be known, details of goods ordered through, for example, clubs or mail order firms, during the month prior to the date of interview, are recorded in the household schedule. The weekly equivalent of the value of the goods is included in the expenditure on the separate items given in the tables in this report. This procedure has the advantage of enabling club transactions to be related to specific articles. Although

payments into clubs, etc. are shown in the diary record-book, these entries are excluded from expenditure estimates.

- **Credit card transactions**
  From 1988 purchases made by credit card or charge card have been recorded in the survey on an acquisition basis rather than the formerly used payment basis. Thus, if a spender acquired an item (by use of credit/charge card) during the two week survey period, the value of the item would be included as part of expenditure in that period whether or not any payment was made in this period to the credit card account. Payments made to the card account are ignored. However any payment of credit/charge card interest is included in expenditure if made in the two week period.

- **Income tax**
  Amounts of income tax deducted under the Pay As You Earn (PAYE) scheme or paid directly by those who are employers or self-employed are recorded (together with information about tax refunds). For employers and the self-employed the amounts comprise the actual payments made in the previous 12 months and may not correspond to the tax due on the income arising in that period, for example if no tax has been paid but is due or if tax payments cover more than one financial year. However, the amounts of tax deducted at source from some of the items which appear in the Income Schedule are not directly available. Estimates of the tax paid on bank and building society interest and amounts deducted from dividends on stocks and shares are therefore made by applying the appropriate rates of tax. In the case of income tax paid at source on pensions and annuities, similar adjustments are made. These estimates mainly affect the relatively few households with high incomes from interest and dividends, and households including someone receiving a pension from previous employment.

- **Rented dwellings**
  Expenditure on rented dwellings is taken as the sum of expenditure on a number of items such as rent, council tax, and water rates. For local authority tenants the expenditure is gross rent less any rebate (including rebate received in the form of housing benefit), and for other tenants it is gross rent less any rent allowance received under statutory schemes including the Housing Benefit Scheme. Rebate on council tax or rates (Northern Ireland) is deducted from expenditure on council tax or rates. Receipts from sub-letting part of the dwelling are not deducted from housing costs but appear (net of the expenses of the sub-letting) as investment income.

- **Rent-free dwellings**
  Rent-free dwellings are those owned by someone outside the household and where either no rent is charged or the rent is paid by someone outside

the household. Households whose rent is paid directly to the landlord by the DWP do not live rent-free. Payments for council tax for example are regarded as the cost of housing. Rebate on rates (Northern Ireland)/council tax/water rates (Scotland) (including rebate received in the form of housing benefit), is deducted from expenditure on rates/council tax/water rates. Receipts from sub-letting part of the dwelling are not deducted from housing costs but appear (net of the expenses of the sub-letting) as investment income.

- **Owner-occupied dwellings**
  In the LCF, payments for water rates, ground rent, fuel, maintenance and repair of the dwelling, among other items, are regarded as the cost of housing. Receipts from letting part of the dwelling are not deducted from housing costs but appear (net of the expenses of the letting) as investment income. Mortgage capital repayments and amounts paid for the outright purchase of the dwelling or for major structural alterations are not included as housing expenditure, but are entered under 'other items recorded', as are council tax, rates (Northern Ireland) and mortgage interest payments. Structural insurance is included in "miscellaneous goods and services".

- **Second-hand goods and part-exchange transactions**
  The survey expenditure data are based on information about actual payments and therefore include payments for second-hand goods and part-exchange transactions. New payments only are included for part-exchange transactions, that is the costs of the goods obtained less the amounts allowed for the goods which are traded in. Receipts for goods sold or traded in are not included in income.

- **Business expenses**
  The survey covers only private households and is concerned with payments made by members of households as private individuals. Spenders are asked to state whether expenditure that has been recorded on the schedules includes amounts that will be refunded as expenses from a business or organisation or that will be entered as business expenses for income tax purposes, for example rent, telephone charges, travelling expenses and meals out. Any such amounts are deducted from the recorded expenditure.

Income
The Household Income and Inequality and Effects of Taxes and Benefits on Household Income bulletins provide a more detailed analysis of disposable income and inequality in the UK. Our preferred measures of household income are published in these releases. Both these releases use data provided by the LCF, the same data source used in Family Spending. The income measures follow the definitions and concepts set out in the Canberra Handbook (published by UNECE), which is the basis of internationally agreed

standards in this area. This defines income as receipts (either monetary or in kind) that are received on a regular basis and are available for current consumption.

To ensure consistency, income only tables previously published as part of Family Spending are now published as part of the financial year ending 2016 (2015/16) household disposable income and inequality bulletin. As such they follow the definitions and concepts set out in the Canberra Handbook. In particular, the definition of disposable income is different between the two publications. Due to this, and other methodological differences, the 2015/16 income-only tables will not be directly comparable with tables published in previous Family Spending releases. Tables that examine expenditure and income in conjunction are unchanged in this release, and are therefore consistent over time. We use equivalised disposable income decile groups when looking at expenditure and income together. Disposable income is defined as gross weekly cash income less the statutory deductions and payments of income tax and National Insurance contributions. It is used alongside expenditure as it is the amount households have available to spend or save. Equivalisation takes into account that households with many members are likely to need a higher income to achieve the same standard of living as households with fewer members. For ownership of durable goods, gross income decile groups are used. The standard concept of gross income is gross weekly cash income current at the time of interview; that is before the deduction of Income Tax actually paid, National Insurance contributions and other deductions at source.

Quantiles
The quantiles of a distribution divide it into a number of equal parts; each of which contains the same number of households. In Family Spending, quantiles are applied to both household expenditure and income distributions.

For example, the median of a distribution divides it into two equal parts, so that half the households in a distribution of household income will have income more than the median, and the other half will have income less than the median. Similarly, quartiles and deciles divide the distribution into four, five and ten equal parts respectively.
Most of the analysis in Family Spending is done in terms of quintile groups and decile groups.

In the calculation of quantiles for this report, zero values are counted as part of the distribution.

Change in definitions, 1991 to 2015/16

1991

No significant changes.

1992

Housing - Imputed rent for owner occupiers and households in rent-free accommodation was discontinued. For owner occupiers this had been the rent they would have had to pay themselves to live in the property they own, and for households in rent-free accommodation it was the rent they would normally have had to pay. Until 1990 these amounts were counted both as income and as a housing cost. Mortgage interest payments were counted as a housing cost for the first time in 1991.

1993

Council Tax - Council Tax was introduced to replace the Community Charge in Great Britain from April 1993.

1994/1995

New expenditure items - The definition of expenditure was extended to include two items previously shown under 'other payments recorded'. These were:
- gambling payments, and
- mortgage protection premiums.

Expenditure classifications - A new classification system for expenditure was introduced in April 1994. The system is hierarchical and allows more detail to be preserved than the previous system. New categories of expenditure were introduced and are shown in detail in Table 7.1. The 14 main groups of expenditure were retained, but there were some changes in the content of these groups.

Gambling payments - data on gambling expenditure and winnings are collected in the expenditure diary. Previously these were excluded from the definition of household expenditure used in the FES. The data are shown as memoranda items under the heading 'Other payments recorded' on both gross and net bases. The net basis corresponds approximately to the treatment of gambling in the National Accounts. The introduction of the National Lottery stimulated a reconsideration of this treatment. From April 1994, (gross) gambling payments have been included as expenditure in 'Leisure Services'. Gambling winnings continued to be noted as a memorandum item under 'Other items recorded'. They are treated as windfall income. They do not form a part of normal household income, nor are they subtracted from gross gambling payments. This treatment is in line with the PRODCOM classification of the statistical office of the European Union (Eurostat) for expenditure in household budget surveys.

1995/1996

Geographical coverage - The FES geographical coverage was extended to mainland Scotland north of the Caledonian Canal.

Under 16s diaries - Two-week expenditure diaries for 7 to 15-year-olds were introduced following three feasibility pilot studies which found that children of that age group were able to cope with the task of keeping a two-week expenditure record. Children are asked to record everything they buy with their own money but to exclude items bought with other people's money. Purchases are coded according to the same coding categories as adult diaries except for meals and snacks away from home which are coded as school meals, hot meals and snacks, and cold meals and snacks. Children who keep a diary are given a £5 incentive payment. A refusal to keep an under 16's diary does not invalidate the household from inclusion in the survey.

Pocket money given to children is still recorded separately in adult diaries, and money paid by adults for school meals and school travel is recorded in the Household Questionnaire. Double counting is eliminated at the processing stage.

Tables in Family Spending reports did not include the information from the children's diaries until the 1998/99 report. Appendix F in the 1998/99 and 1999/2000 reports show what difference the inclusion made.

1996/1997

Self- employed - The way in which information about income from self-employment is collected was substantially revised in 1996/97 following various tests and pilot studies. The quality of such data was increased but this may have lead to a discontinuity. Full details are shown in the Income Questionnaire, available from the address in the introduction.

Cable/satellite television - Information on cable and satellite subscriptions is now collected from the household questionnaire rather than from the diary, leading to more respondents reporting this expenditure.

Mobile phones - Expenditure on mobile phones was previously collected through the diary. From 1996/97 this has been included in the questionnaire.

Job Seekers Allowance (JSA) - Introduced in October 1996 as a replacement for Unemployment Benefit and any Income Support associated with the payment of Unemployment Benefit. Receipt of JSA is collected with NI Unemployment Benefit and with Income Support. In both cases the number of weeks a respondent has been in receipt of these benefits is taken as the number of weeks receiving JSA in the last 12 months and before that period the number of weeks receiving Unemployment Benefit/Income Support.

Retrospective recall - The period over which information is requested has been extended from 3 to 12 months for vehicle purchase and sale. Information on the purchase of car and motorcycle spare parts is no longer collected by retrospective recall. Instead expenditure on these items is collected through the diary.

State benefits - The lists of benefits specifically asked about was reviewed in 1996/97. See the Income Questionnaire for more information.

Sample stratifiers - New stratifiers were introduced in 1996/97 based on standard regions, socio-economic group and car ownership.

Government Office Regions - Regional analyses presented using the Government Office Regions (GORs) formed in 1994. Previously all regional analyses used Standard Statistical Regions (SSRs). For more information see Appendix F in the 1996/97 report.

1997/1998

Bank/building society service charges - Collection of information on service charges levied by banks has been extended to include building societies.

Payments from unemployment/redundancy insurances - Information is now collected on payments received from private unemployment and redundancy insurance policies. This information is then incorporated into the calculation of income from other sources.

Retired households - The definition of retired households has been amended to exclude households where the head of the household is economically active.

Rent-free tenure - The definition of rent-free tenure has been amended to include those households for which someone outside the household, except an employer or an organisation, is paying a rent or mortgage on behalf of the household.

National Lottery - From February 1997 expenditure on National Lottery tickets was collected as three separate items: tickets for the Wednesday draw only, tickets for the Saturday draw only and tickets for both draws.

Northern Ireland sample boost - From 1997/98 Northern Ireland was over sampled in order to provide enough households to conduct separate regional analysis.

1998/1999

Children's income - Three new expenditure codes were introduced: pocket money to children; money given to children for specific purposes and cash gifts to children. These replaced a single code covering all three categories.

Main job and last paid job - Harmonised questions were adopted.

1999/2000

Disabled Persons Tax Credit replaced Disability Working Allowance and **Working Families Tax Credit** replaced Family Credit from October 1999.

2000/2001

Household definitions - The definition was changed to the harmonised definition which has been in use in the Census and nearly all other

government household surveys since 1981. The effect is to group together into a single household some people who would have been allocated to separate households on the previous definition. The effect is fairly small but not negligible.

Up to 1999/2000 the FES definition was based on the pre-1981 Census definition and required members to share eating and budgeting arrangements as well as share living accommodation.

The definition of a household was:
- one person or a group of people who have the accommodation as their only or main residence, and (for a group) share the living accommodation, that is a living or sitting room, **and** share meals together (or have common housekeeping).

The harmonised definition is less restrictive:
- one person or a group of people who have the accommodation as their only or main residence and (for a group) share the living accommodation, that is a living or sitting room **or** share meals together or have common housekeeping.

The effect of the change is probably to increase average household size by 1%.

Question reductions - A thorough review of the questionnaire showed that a number of questions were no longer needed by government users. These were cut from the 2000/01 survey to reduce the burden on respondents. The reduction was fairly small but it did make the interview flow better. All the questions needed for a complete record of expenditure and income were retained.

Redesigned diary - The diary was redesigned to be easier for respondents to keep and to look cleaner. The main change of substance was to delete the column for recording whether each item was purchased by credit, charge or shop card.

Ending of MIRAS - Tax relief on interest on loans for house purchase was abolished from April 2000. Questions related to MIRAS (Mortgage Interest Relief at Source) were therefore dropped. They included some that were needed to estimate the amount if the respondent did not know it. A number were retained for other purposes, however, such as the amount of the loan still outstanding which is still asked for households paying a reduced rate of interest because one of them works for the lender.

2001/2002

Expenditure and Food Survey (EFS) introduced, replacing the Family Expenditure Survey (FES) and National Food Survey (NFS).

Household reference person - this replaced the previous concept of head of household. The household reference person is the householder that is the person who:
- owns the household accommodation, or
- is legally responsible for the rent of the accommodation, or
- has the household accommodation as an emolument or perquisite, or
- has the household accommodation by virtue of some relationship to the owner who is not a member of the household.

If there are joint householders the household reference person is the one with the higher income. If the income is the same, then the eldest householder is taken.

A key difference between household reference person and head of household is that the household reference person must always be a householder, whereas the head of household was always the husband, who might not even be a householder himself.

National Statistics Socio-economic Classification (NS-SEC) - the National Statistics Socio-economic Classification (NS-SEC) was adopted for all official surveys, in place of Social Class based on Occupation (SC) and Socio-economic Group (SEG). NS-SEC is itself based on the Standard Occupational Classification 2000 (SOC2000) and details of employment status.

The long-term unemployed, which fall into a separate category, are defined as those unemployed and seeking work for 12 months or more. Members of the armed forces, who were assigned to a separate category in Social Class, are included within the NS-SEC classification. Residual groups that remain unclassified include students and those with inadequately described occupations.

COICOP - From 2001/02, the Classification Of Individual COnsumption by Purpose (COICOP/HBS, referred to as COICOP in this report) was introduced as a new coding frame for expenditure items. COICOP has been adapted to the needs of household budget surveys (HBS) across the EU and, as a consequence, is compatible with similar classifications used in national accounts and consumer price indices. This allows the production of indicators

which are comparable Europe-wide, such as the Harmonised Indices of Consumer Prices (computed for all goods as well as sub-categories such as food and transport). The main categorisation of spending used in this report (namely 12 categories relating to food and non-alcoholic beverages; alcoholic beverages, tobacco and narcotics; clothing and footwear; housing, fuel and power; household goods and services; health; transport; communication; recreation and culture; education; restaurants and hotels; and miscellaneous goods and services) is only comparable between the two frames at a broad level. Table 4.1 has been produced by mapping COICOP to the FES 14 main categories. However the two frames are not comparable for any smaller categories, leading to a break in trends between 2000/01 and 2001/02 for any level of detail below the main 12-fold categorisation. A complete listing of COICOP and COICOP plus (an extra level of detail added by individual countries for their own needs) is available on request from the address in the introduction.

Proxy interviews - While questions about general household affairs are put to all household members or to a main household informant, questions about work and income are put to the individual members of the household. Where a member of the household is not present during the household interview, another member of the household (for example, a spouse) may be able to provide information about the absent person. The individual's interview is then identified as a proxy interview. From 2001/02 the EFS began accepting responses that contained a proxy interview.

Short income - From 2001/02 the EFS accepted responses from households that answered the short income section. This was designed for respondents who were reluctant to provide more detailed income information.

2002/2003

Main shopper - At the launch of the EFS in April 2001, the respondent responsible for buying the household's main shopping was identified as the 'main diary keeper' also known as the 'main shopper'.
The importance of the main shopper is to ensure that information is obtained on the bulk of the shopping in the household. Without this person's co-operation, there is insufficient information to use the other diaries kept by members of the household in a meaningful way. The main shopper must therefore complete a diary for the interview to qualify as a full or partial interview. Without their participation, the outcome will be a refusal no matter who else is willing to complete a diary.

2003/2004

Working Tax Credit replaced Disabled Persons Tax Credit and Working Families Tax Credit from April 2003.

Pension Credit replaced Minimum Income Guarantee from October 2003.

Child Tax Credit replaced Children's Tax Credit and Childcare Tax Credit from April 2003.

2004/2005

No significant changes.

2005/2006

Urban and rural definitions - A new urban and rural area classification based on 2001 Census data has been introduced onto the EFS dataset and is presented in Tables A38, A45 and A48 of this publication. The classification replaces the Department for Transport, Local Government and the Regions (DTLR) 1991 Census-based urban and rural classification that was used in previous editions of Family Spending. The new classification is the standard National Statistics classification for identifying urban and rural areas in England and Wales, and Scotland. Please refer to 'Definitions' for further details.

Motor vehicle road taxation refunds - Questions on road tax refunds were inadvertently omitted from the 2005/06 questionnaire. Within the Appendix A tables of the 2005/06 report, the heading for category 13.2.3 'Motor vehicle road taxation payments less refunds' has been changed to reflect this omission.

Purchase of vehicles - During April to December 2005, respondents who had sold a vehicle were not asked whether they had bought that same vehicle in the previous year. This was corrected from January 2006, but means that some expenditure on vehicles may have been missed.

2006

Reporting period - The LCF started reporting on a calendar-year basis, rather than for financial years.

2007

Mortgage interest payments - An improvement to the imputation of mortgage interest payments was implemented and applied to 2006 and 2007

data in this publication, which should lead to more accurate figures. This will also lead to a slight discontinuity.

Mortgage capital repayments - An error was discovered in the derivation of mortgage capital repayments which was leading to double counting. This was amended for the 2006 and 2007 data in this publication, which will cause a minor discontinuity.

2008

IHS - The LCF joined the Integrated Household Survey (IHS).

NS-SEC - The LCF question used to derive the student category for NS-SEC B was changed in 2008 due to the introduction of the Integrated Household Survey (IHS). Prior to the IHS, respondents were asked if they were currently in full-time education and those who responded yes to this question were classified as students. Since 2008, respondents have been asked if they are enrolled on any full-time or part-time education course and those who respond 'yes' have then been asked to select the course they are attending from a set of options. Respondents who select any of the full-time course options have been classified as students under NS-SEC. This more stringent definition of full-time student has resulted in a decrease in the number of people classified as students.

2009

Gas and electricity payment methods - Following consultation with the Department for Energy and Climate Change (DECC), the payment methods have been updated for the gas and electricity questions. This has brought the LCF questions in line with those on the EHS. This may cause a slight discontinuity in the data.
A question was added to capture the take up of the Health in Pregnancy grant, a benefit introduced in April 2009.

A question capturing Cold Weather Payments was included from July 2009 onwards.

2010

Multiple household interviews - In 2010 the LCF in line with other ONS social surveys changed the way interviews were conducted at addresses with more than one private household. Until July 2010 interviewers were instructed to interview all households (up to a maximum of three at any one address) when a sampled address contained more than one private household. From July onwards interviewers were no longer required to interview multiple

households at these addresses, instead a random selection method is used to select one household to interview.

Northern Ireland sample - Until 2010 the LCF ran a boosted Northern Ireland sample which allowed for separate Northern Ireland analysis to be conducted, at the end of 2009 this boost came to an end.

Female pension age - Due to changes in the female pension age, the way in which pensioner households are identified has changed. Until May 2010 any female over 60 and male over 65 was defined as a pensioner. From May 2010 onwards the female pension age increases gradually, which is reflected in the LCF definition.

Internet subscription fees - For 2010 the internet subscription fees sub-category has been moved from recreation and culture to the communications category of COICOP.

2011

Definition of a household - Changed in line with the definition used in the 2011 Census: One person living alone or a group of people (not necessarily related living at the same address) who share cooking facilities AND share a living room or sitting room or dining area.

Changes to Socio Economic Classification - The Standard Occupational Classification has been revised for the 2011 survey, which is reflected in the change in name from SOC2000 to SOC2010. Revisions have been made where changes in the organisation of work, or in the type of work carried were most evident. Occupations particularly affected by these changes include those related to information and communication technologies; education; health; social care; culture; media; sports; and leisure.

The most important change introduced in SOC2010 has been the revision of managerial status to improve the harmonisation between the classifications of occupations in the UK with other countries in the European Union. Within the UK the title "manager" is often used to describe what would be regarded as supervisory or administrative positions in many other EU countries. The definition of manager now focuses on the control of resources at the organisational level and the strategic aspects of the position rather than the day-to-day tasks. The revisions have resulted in a significant decrease in the number of respondents coded to the Managers and Senior Officials major group and a significant increase in major group 2 Professional Occupations.

The SOC2010 revisions have created a discontinuity in the Family Spending tables that refer to socio-economic classification. The number of households with a household reference person in the Large employers and higher managerial category has decreased while the number of households with a household reference person in the Higher Professional category has increased.

Questionnaire changes - Questionnaire changes including the addition of a section designed to capture expenditure on combined communication packages, as well as alterations to the holiday expenditure questions, are detailed in 'Survey Improvements'.

2012

Main diary keeper definition - Rules for identifying the main diary keeper, when the household cannot identify who is responsible for most of the food shopping, changed for 2012:

Rule 1: Establish who in the household has the highest income.

Rule 2: If each household member has the same income then find out who is the oldest.

Chapter 3: income quintiles have been calculated separately for retired and non-retired households in tables showing expenditure by income quintiles for different household compositions.

Trends in expenditure over time: expenditure figures have been adjusted for inflation using the Consumer Prices Index (CPI), using indices specific to each major COICOP category. This is with the exception of specific items to which the CPI is not applicable: for mortgage interest payment and council tax payments the Retail Prices Index (RPI) was used. The approach used to deflate figures is different from previous editions, when the all-items RPI was used.

2013

Universal Credit (UC) - Roll out of UC started in October 2013 as a replacement for income-based Job Seekers Allowance (JSA), income related Employment and Support Allowance (ESA), Income Support, Child Tax Credits, Working Tax Credits, and Housing Benefit, mainly for those aged 18 to State Pension Age (SPA). See the income questionnaire for more information.

Personal Independence Payment (PIP) - Started to replace Disability Living Allowance from April 2013. See the income questionnaire for more information.

2014

No change to definitions.

2015/16

No change to definitions.

Appendix

Table A1   LCF response by month, 2015/16
Great Britain

	April 2015		May 2015		June 2015		July 2015	
	Number of households	Percentage of households	Number of households	Percentage of households	Number of households	Percentage of households	Number of households	Percentage of households
Set sample	954		972		955		954	
Ineligible	111		75		100		117	
Extra households	0		0		1		0	
Total eligible	**843**	**100**	**897**	**100**	**855**	**100**	**837**	**100**
Refusals	336	40	328	37	346	40	340	41
Non-contacts	104	12	120	13	105	12	111	13
Co-operating households	403	48	449	50	404	47	386	46

	August 2015		September 2015		October 2015		November 2015	
	Number of households	Percentage of households	Number of households	Percentage of households	Number of households	Percentage of households	Number of households	Percentage of households
Set sample	954		954		954		954	
Ineligible	83		101		113		86	
Extra households	0		0		0		0	
Total eligible	**871**	**100**	**853**	**100**	**841**	**100**	**868**	**100**
Refusals	379	44	335	39	359	43	338	39
Non-contacts	104	12	102	12	73	9	108	12
Co-operating households	388	45	416	49	409	49	422	49

	December 2015		January 2016		February 2016		March 2016	
	Number of households	Percentage of households	Number of households	Percentage of households	Number of households	Percentage of households	Number of households	Percentage of households
Set sample	954		954		954		972	
Ineligible	99		80		78		91	
Extra households	0		0		0		0	
Total eligible	**855**	**100**	**874**	**100**	**876**	**100**	**881**	**100**
Refusals	361	42	382	44	415	47	389	44
Non-contacts	115	13	117	13	117	13	114	13
Co-operating households	379	44	382	44	344	39	378	43

Table A2 LCF response by quarter, 2015/16
Great Britain

	April to June 2015		July to September 2015		October to December 2015		January to March 2016	
	Number of households	Percentage of households	Number of households	Percentage of households	Number of households	Percentage of household	Number of households	Percentage of households
Set sample	2,881		2,862		2,862		2,880	
Ineligible	286		302		299		249	
Extra households	1		0		0		0	
Total eligible	2,595	**100**	2,560	**100**	2,563	**100**	2,631	**100**
Refusals	1010	**39**	1,054	**41**	1058	**41**	1179	**45**
Non-contacts	329	**13**	316	**12**	295	**12**	348	**13**
Co-operating households	1,256	**48**	1,190	**46**	1,210	**47**	1,104	**42**

Table A3   Characteristics of households, 2015/16
Great Britain

	Percentage[1] of all house- holds	Weighted number of house- holds (000s)	House- holds in sample (number)		Percentage[1] of all house- holds	Weighted number of house- holds (000s)	House- holds in sample (number)
Total number of households	100	27,220	4,920	**Composition of household (cont)**			
				Four adults	2	660	90
Size of household							
One person	29	7,770	1,340	Four adults, one child	1	140	20
Two persons	36	9,810	1,860	Four adults, two or more children	[0]	110	20
Three persons	16	4,310	760				
Four persons	13	3,640	650	Five adults	[0]	130	10
Five persons	4	1,180	220				
Six persons	1	330	60	Five adults, one or more children	[0]	40	..
Seven persons	1	140	20				
Eight persons	[0]	20	..	All other households without children	[0]	50	..
Nine or more persons	[0]	20	..	All other households with children	[0]	30	..
Composition of household				**Number of economically active**			
One adult	29	7,770	1,340	**persons in household**			
Retired households mainly				No person	31	8,540	1,580
dependent on state pensions[2]	3	740	120	One person	29	7,790	1,450
Other retired households	10	2,660	460	More than one person	40	10,900	1,880
Non-retired households	16	4,380	770	Two persons	32	8,670	1,550
One man	13	3,570	610	Three persons	6	1,650	260
Aged under 65	9	2,420	390	Four persons	2	470	60
Aged 65 and over	4	1,150	220	Five persons	[0]	70	..
One woman	15	4,200	740	Six or more persons	[0]	[30]	..
Aged under 60	5	1,360	260				
Aged 60 and over	10	2,850	480				
				Households with married women	46	12,470	2,400
One adult, one child	2	670	130	Households with married women			
One man, one child	[0]	70	10	economically active	26	6,970	1,300
One woman, one child	2	600	120	With no dependent children	13	3,530	650
One adult, two or more children	2	580	130	With dependent children	13	3,450	650
One man, two or more children	[0]	70	10	One child	5	1,470	250
One woman, two or more children	2	510	110	Two children	5	1,460	290
				Three children	2	420	90
One man, one woman	31	8,310	1,600	Four or more children	[0]	90	20
Retired households mainly							
dependent on state pensions[2]	2	440	90	Households with married women			
Other retired households	10	2,730	550	not economically active	20	5,500	1,100
Non-retired households	19	5,140	960	With no dependent children	15	4,140	850
Two men or two women	3	830	120	With dependent children	5	1,360	250
				One child	2	460	80
Two adults with children	20	5,560	1,060	Two children	2	540	100
One man one woman, one child	8	2,160	380	Three children	1	250	50
Two men or two women, one child	0	110	20	Four or more children	0	100	20
One man one woman, two children	8	2,310	450				
Two men or two women,							
two children	[0]	20	..				
One man one woman, three children	3	710	150	**Economic status of household reference person**			
Two men or two women,				Economically active	63	17,050	3,050
three children	[0]	10	..	Employee at work	53	14,300	2,570
Two adults, four children	1	170	30	Full-time	42	11,450	2,030
Two adults, five children	[0]	60	10	Part-time	10	2,850	530
Two adults, six or more children	[0]	10	..				
				Government-supported training	[0]	50	..
Three adults	6	1,610	260				
				Unemployed	2	500	90
Three adults with children	3	720	120	Self-employed	8	2,210	400
Three adults, one child	2	520	80				
Three adults, two children	1	160	30	Economically inactive	37	10,170	1,860
Three adults, three children	[0]	30	..				
Three adults, four or more children	[0]	10	..				

Note: Changes to categories of socio economic classification were made in 2011. Please see changes in definitions.

Please see background notes for symbols and conventions used in this report.

1 Based on weighted number of households.

2 Mainly dependent on state pensions and not economically active - see definitions.

Table A3   Characteristics of households, 2015/16 (cont.)
Great Britain

	Percentage[1] of all house- holds	Weighted number of house- holds (000s)	House- holds in sample (number)		Percentage[1] of all house- holds	Weighted number of house- holds (000s)	House- holds in sample (number)
Age of household reference person				**GB urban/rural areas 2013-14 to 2015-16 (3-year average)**			
15 and under 20 years	[0]	30	..				
20 and under 25 years	3	840	110	GB Urban	78	20,380	3,760
25 and under 30 years	7	1,780	250	GB rural	22	5,770	1,160
30 and under 35 years	8	2,220	380				
35 and under 40 years	8	2,170	400	**Tenure of dwelling[5]**			
40 and under 45 years	9	2,460	470	Owners			
45 and under 50 years	10	2,760	510	Owned outright	34	9,200	1,760
50 and under 55 years	10	2,770	480	Buying with a mortgage	30	8,190	1,520
55 and under 60 years	8	2,290	440	All	64	17,390	3,280
				Social rented from			
60 and under 65 years	8	2,160	450	Council	9	2,440	430
65 and under 70 years	8	2,260	470	Registered social landlord	9	2,310	400
70 and under 75 years	7	1,780	370	All	17	4,760	830
				Private rented			
75 and under 80 years	5	1,420	270	Rent free	1	330	60
80 and under 85 years	4	1,200	200	Rent paid, unfurnished	14	3,790	630
85 and under 90 years	3	720	90	Rent paid, furnished	3	950	120
90 years or more	1	360	40	All	19	5,080	810
				Households with durable goods			
Regions and Countries				Car/van	78	21,120	3,950
2013-14 to 2015-16 (3-year average)				One	45	12,180	2,280
United Kingdom	100	26,870	5,080	Two	26	7,120	1,360
England	84	22,470	4,260	Three or more	7	1,820	320
North East	4	1,100	240				
North West	11	3,010	580	Central heating, full or partial	95	25,940	4,700
Yorkshire and the Humber	9	2,300	460	Fridge-freezer or deep freezer	98	26,650	4,820
East Midlands	7	1,970	410	Washing machine	97	26,500	4,800
West Midlands	9	2,380	470	Tumble dryer	56	15,210	2,850
East of England	9	2,510	500	Dishwasher	45	12,150	2,290
London	12	3,260	440	Microwave oven	93	25,310	4,590
South East	13	3,610	690				
South West	9	2,320	470	Telephone	88	23,960	4,380
Wales	5	1,310	240	Mobile phone	95	25,880	4,700
Scotland	9	2,370	420	DVD player	80	21,710	4,000
Northern Ireland	3	720	150	Home computer	88	23,830	4,350
				Internet connection	88	23,840	4,350
Socio-economic classification							
of household reference person							
Higher managerial and professional	13	3,590	660				
Large employers/higher managerial	3	850	170				
Higher professional	10	2,740	500				
Lower managerial and professional	19	5,160	940				
Intermediate	7	1,840	350				
Small employers	7	1,880	330				
Lower supervisory	6	1,560	270				
Semi-routine	8	2,140	380				
Routine	8	2,050	350				
Long-term unemployed[3]	2	440	80				
Students	2	510	70				
Occupation not stated[4]	30	8,070	1,490				

Note: Changes to categories of socio-economic classification were made in 2011. Please see changes in definitions.
Please see background notes for symbols and conventions used in this report.
1 Based on weighted number of households.
2 Mainly dependent on state pensions and not economically active - see definitions.
3 Includes those who have never worked.
4 Includes those who are economically inactive - see definitions.
5 See footnotes on Table A32.

Source: Office for National Statistics

Table A4 Characteristics of persons, 2015/16

Great Britain

	Males				Females				All persons		
	Percentage [1] of		Weighted number of persons (000s)	Persons in the sample (number)	Percentage [1] of		Weighted number of persons (000s)	Persons in the sample (number)	Percentage [1] of	Weighted number of persons (000s)	Persons in the sample (number)
	all males	all persons			all females	all persons			all persons		
All persons	**100**	**50**	**31,800**	**5,660**	**100**	**50**	**32,330**	**5,960**	**100**	**64,130**	**11,620**
Adults	**77**	**38**	**24,630**	**4,270**	**80**	**40**	**25,820**	**4,680**	**79**	**50,440**	**8,950**
Persons aged under 60	56	28	17,730	2,880	55	28	17,910	3,170	56	35,640	6,050
Persons aged 60 or under 65	5	3	1,720	350	6	3	1,790	390	5	3,510	740
Persons aged 65 or under 70	5	3	1,720	360	6	3	1,830	410	6	3,550	770
Persons aged 70 or over	11	5	3,450	680	13	7	4,290	720	12	7,740	1,400
Children	**23**	**11**	**7,180**	**1,390**	**20**	**10**	**6,510**	**1,280**	**21**	**13,690**	**2,670**
Children under 2 years of age	3	1	870	160	3	1	840	150	3	1,710	310
Children aged 2 or under 5	4	2	1,240	230	3	2	1,090	210	4	2,330	440
Children aged 5 or under 16	14	7	4,320	880	12	6	3,810	790	13	8,130	1,670
Children aged 16 or under 18	2	1	750	130	2	1	780	130	2	1,520	260
Economic activity											
Persons active (aged 16 or over)	55	27	17,340	2,910	47	24	15,190	2,730	51	32,530	5,640
Persons not active	45	23	14,470	2,750	53	27	17,140	3,230	49	31,610	5,970
Men 65 or over and											
Women 60 or over	14	7	4,510	900	19	10	6,190	1,150	17	10,700	2,050
Others (including children under 16)	31	16	9,960	1,840	34	17	10,940	2,080	33	20,900	3,920

Please see background notes for symbols and conventions used in this report.

1 Based on weighted number of households.

Source: Office for National Statistics