



Department
for Work &
Pensions

Households Below Average Income (HBAI) Quality and Methodology Information Report – 2012/13

July 2014

Contents

Introduction	3
Using survey data	4
Population	5
Grossing	6
Sampling error	10
Adjustment for individuals with very high incomes	11
Equivalisation	12
Material deprivation for pensioners	16
Material deprivation weighting methodology	18
Income definition	19
Interpreting low income measures	22
Using HBAI	24
Ethnic categories	28
Disability definition	29
Comparison with EU low-income statistics	32

Introduction

The HBAI statistics incorporate widely-used, international standard measures of low income and inequality. They provide a range of measures of low income, income inequality and material deprivation to capture different aspects of changes to living standards. The series started in 1994/95 and so allows for comparisons over time, as well as between different groups of the population. The statistics are based on the Family Resources Survey (FRS), whose focus is capturing information on incomes, and as such captures more detail on different income sources compared to other household surveys. The FRS captures a lot of contextual information on the household and individual circumstances, such as employment, education level and disability. This is therefore a very comprehensive data source allowing for a lot of different analysis.

This report provides detailed information on key quality and methodological issues relating to HBAI data. Chapter 7 of the FRS report also includes useful information on the FRS methodology.

Using survey data

HBAI is based on the FRS which is a household survey and so subject to the nuances of using a survey, including:

- **Sampling error.** This will vary to a greater or lesser extent depending on the level of disaggregation at which results are presented.
- **Non-response error.** The FRS response rate in 2012/13 was 60 per cent. In an attempt to correct for differential non-response, estimates are weighted using population totals.
- **Survey coverage.** The FRS covers private households in the United Kingdom. Therefore individuals in nursing or retirement homes, for example, will not be included. This means that figures relating to the most elderly individuals may not be representative of the United Kingdom population, as many of those at this age will have moved into homes where they can receive more frequent help.
- **Survey design.** The FRS uses a clustered sample designed to produce robust estimates at former government office region (GOR) level. The FRS is therefore not suitable for analysis below this level.
- **Sample size.** Although the FRS has a relatively large sample size for a household survey, small sample sizes may require several years of data to be combined. From April 2011, the target achieved GB sample size for the FRS was reduced by 5,000 households, resulting in an overall achieved sample size for the UK of around 20,000 households for 2011/12. We previously published an [assessment](#) concluding that this still allows core outputs (such as measures of poverty and take-up of income related benefits) from the FRS to be produced, though with slightly wider confidence intervals or ranges.

Further methodological details relating to the FRS are given in Chapter 7 of the 2012/13 FRS report.

Population

The analyses in this publication are primarily based on the FRS. Households in Northern Ireland (NI) were surveyed for the first time in the 2002/03 survey year. A detailed analysis of observed trends, together with results for NI and the UK for the first three years of NI data can be found in Appendix 3 of the 2004/05 publication.

For some tables, estimates for NI have been imputed for the years 1998/99 to 2001/02. This allows for changes since 1998/99 to be measured at the UK level. For further details, see Appendix 4 of the HBAI 2004/05 publication. The FRS time series in this publication are presented with discontinuities in the years where there is a change from GB to UK.

The survey covers the private household sector. All the results therefore exclude people living in institutions, e.g. nursing homes, halls of residence, barracks or prisons, and homeless people living rough or in bed and breakfast accommodation. The area of Scotland north of the Caledonian Canal was included in the FRS for the first time in the 2001/02 survey year and, from the 2002/03 survey year, the FRS was extended to include a 100 per cent boost of the Scottish sample. This has increased the sample size available for analysis at the Scottish level.

A further adjustment is that households containing a married adult whose spouse is temporarily absent, whilst within the scope of the FRS, are excluded from HBAI. Similarly, prior to the 1996/97 data, households containing a self-employed adult who had been full-time self-employed for less than two months were excluded. This exclusion is no longer made because of the improvements in the self-employment questions in the FRS.

Grossing

The 2012/13 HBAI publication presents tabulations where the percentages refer to sample estimates grossed-up to apply to the whole population.

Grossing-up is the term usually given to the process of applying factors to sample data so that they yield estimates for the overall population. The simplest grossing system would be a single factor e.g. the number of households in the population divided by the number in the achieved sample. However, surveys are normally grossed by a more complex set of grossing factors that attempt to correct for differential non-response at the same time as they scale up sample estimates.

The system used to calculate grossing factors for HBAI mirrors that of FRS grossing with two differences.

The system used to calculate grossing factors for the FRS divides the sample into different groups. The groups are designed to reflect differences in response rates among different types of households¹. They have also been chosen with the aims of DWP analyses in mind. The population estimates for these groups, obtained from official data sources, provide control variables. The grossing factors are then calculated by a process which ensures the FRS produces population estimates that are the same as the control variables.

A grossed FRS count of the number of owner-occupied households would thus tie in with the Department for Communities and Local Government (DCLG) official figure; whilst the grossed number of men aged 35-39 would be consistent with the Office for National Statistics (ONS) estimate (see Table 1). Some adjustments are made to the original control total data sources so that definitions match those in the FRS, e.g. an adjustment is made to the demographic data to exclude people not resident in private households. It is also the case that some totals have to be adjusted to correspond to the FRS survey year.

A software package called CALMAR, provided by the French National Statistics Institute, is used to reconcile control variables at different levels and estimate their joint population. This software makes the final weighted sample distributions match the population distributions through a process known as calibration weighting. It should be noted that if a few cases are associated with very small or very large grossing factors, grossed estimates will have relatively wide confidence intervals.

As stated above, the system used to calculate grossing factors for HBAI mirrors that of FRS grossing with two differences. The first difference with FRS grossing is that the sample of households is smaller for HBAI purposes because households with spouses living away from home are excluded (see Population section above). The second difference is that separate control totals are introduced for 'very rich' households so that the top end of the income distribution is more accurately reflected, which is particularly important for estimates of mean income.

¹ *The FRS stratified sample structure is designed to minimise differential non-response in the achieved sample. Grossing is then designed to account for residual differential non-response.*

HBAI Quality and Methodology Information Report

As with the FRS, the grossing regime for HBAI 2012/13 grossing regime uses newly available population and household estimates based on the results of the 2011 Census. Previously, 2001 census based estimates were used. In addition, a review of FRS grossing was carried out on behalf of DWP by the ONS Methodological Advisory Service. In implementing the review recommendations, a number of relatively minor methodological improvements have been implemented for 2012/13.

The main changes implemented are as follows:

- improvements to the categorisation of tenure control totals ,
- a full breakdown of the total number of households into each of the English regions (in addition breakdowns for Scotland, Wales and Northern Ireland).
- a new adjustment to account for the different rates of sampling in England and Wales, Scotland, and Northern Ireland.

A back-series of grossing factors calculated using the new methodology has also been created for each year back to 2002/03, and are used in the tables in the HBAI 2012/13 publication. Further details and analysis of the impact of these methodological changes are published in a [separate document](#).

In developing the grossing regime careful consideration has been given to the combination of control totals and the way age ranges, Council Tax bands and so on, have been grouped together. The aim has been to strike a balance so that the grossing system will provide, where possible, accurate estimates in different dimensions without significantly increasing variances.

There are some differences between the methods used to gross the Northern Ireland sample as compared with the Great Britain sample:

- Local taxes in Northern Ireland are collected through the rates system, so Council Tax Band as a control variable is not applicable.
- Northern Ireland housing data are based largely on small sample surveys. It is not desirable to introduce the variance of one survey into another by using it to compute control totals; therefore tenure type has not been used as a control variable.

Details of the grossing regime for Northern Ireland are shown in Table 2.

Table 1: HBAI grossing regime for Great Britain

Control totals for Great Britain	Groupings	Original Source	Adjustments made by DWP
Private household population by region, age, and sex	Regions: North East, North West, Yorkshire and Humber, East Midland, West Midlands, East of England, London, South East, South West, Wales, Scotland. Sex and Age: Males aged 0-9, 10-19 dependents, 16-24 non-dependents, 25-29, 30-39, 40-44, 45-49, 50-59, 60-64, 65-74, 75-79, 80+; Females aged 0-9, 10-19 dependents, 15-24 non-dependents, 25-29, 30-34, 35-39, 40-44, 45-49, 50-59, 60-69, 70-74, 75-79, 80+	Mid-year population estimates. Office of National Statistics	ONS total population figures are adjusted for private household estimates using data supplied by ONS directly to DWP. 16-19-year-old dependents and non-dependent are split using data supplied by HMRC directly to DWP.
Benefit Units with children	Region: England and Wales, Scotland	Families in receipt of child benefit. HM Revenues and Customs	
Lone parents	Sex; Males, Females	Lone parent estimates. Labour Force Survey	Adjusted for FRS survey year (April-March)
Households by region	Region: North East, North West, Yorkshire and Humber, East Midlands, West Midlands, East of England, London, South East, South West,	Households by region. Department for Communities and Local Government	Adjusted for FRS survey year (April-March)
Households by tenure type	Tenure (Social Renters, Private Renters, Owner Occupied)	Dwellings by tenure type. Department of Communities and Local Government	Household control totals are calculated using dwellings data published by DCLG, Welsh Government, Scottish Government. Adjusted for FRS survey year (April-March)
Households by council tax band	Council Tax Band (NVS and A, B, C and D, E to H)	Dwellings by council tax band published by	Household control totals are calculated using dwellings data published by VOA / Scottish Government, adjusted for FRS survey year (April-March). Estimates
Households containing 'Very Rich' people	Pensioners, Non-pensioners	HMRC Survey of Personal Incomes (SPI)	

Table 2: HBAI grossing regime for Northern Ireland

Control totals for Northern Ireland	Groupings	Original Source	Adjustments made by DWP
Private household population by age and sex	Sex and Age: Males 0-19 dependents, 16-24 independents, 25-29, 30-34, 35-39, 40-44, 45-49, 50-59, 60-65, 65-74, 75-79, 80+; Females aged 0-19 dependents, 16-24 non-dependents, 25-29, 30-34, 35-39, 40-44, 45-49, 50-59, 60-69, 70-74, 75-79, 80+	Private household estimates. Department for Social Development in Northern Ireland.	
Households		Household estimates. Department for Social Development in Northern Ireland	
Lone parents		Lone parent estimates. Department for Social Development in Northern Ireland	
Households containing 'Very Rich' people	Pensioners, Non-pensioners	HMRC Survey of Personal Incomes (SPI)	

Sampling error

Survey results are always estimates, not precise figures. This means that they are subject to a level of uncertainty which can affect how changes, especially over the short term, should be interpreted.

Two different random samples from one population, for example the UK, are unlikely to give exactly the same survey results, which are likely to differ again from the results that would be obtained if the whole population was surveyed. The level of uncertainty around a survey estimate can be calculated and is commonly referred to as sampling error.

We can calculate the level of uncertainty around a survey estimate by exploring how that estimate would change if we were to draw many survey samples for the same time period instead of just one. This allows us to define a range around the estimate (known as a “confidence interval”) and to state how likely it is that the real value that the survey is trying to measure lies within that range. Confidence intervals are typically set up so that we can be 95% sure that the true value lies within the range – in which case this range is referred to as a “95% confidence interval”. **Chapter 8** of the HBAI 2012/13 publication provides estimates of the sampling error.

In addition to sampling errors, consideration should also be given to non-sampling errors. Sampling errors arise through the process of random sampling and the influence of chance. Non-sampling errors arise from the introduction of some systematic bias in the sample as compared to the population it is supposed to represent. As well as response bias, such biases include inappropriate definition of the population, misleading questions, data input errors or data handling problems – in fact any factor that might lead to the survey results systematically misrepresenting the population. There is no simple control or measurement for such non-sampling errors, although the risk can be minimised through careful application of the appropriate survey techniques from the questionnaire and sample design stages through to analysis of results.

Adjustment for individuals with very high incomes

An adjustment is made to sample cases at the top of the income distribution to correct for volatility in the highest incomes captured in the survey. This adjustment uses data from [HM Revenue and Customs' Survey of Personal Incomes \(SPI\)](#) to control the numbers and income levels of the 'very rich' while retaining the FRS data on the characteristics of their households. The methodology defines a household as 'very rich' if it contains a 'very rich' individual and it adjusts pensioners and non-pensioners separately. Thresholds have been set at the level above which, for each group, the FRS data is considered to be volatile due to small numbers of cases.

From the 2009/10 publication, we changed the SPI adjustment methodology to be based on adjusting a fixed fraction of the population rather than on adjusting the incomes of all those individuals with incomes above a fixed cash terms level. This should prevent an increasing fraction of the dataset being adjusted. The adjustment fraction was set at the same level as the fraction adjusted in 2008/09. We have also moved to basing all SPI adjustment decisions on gross rather than a mixture of gross and net incomes. These changes only have a very small effect on the results as presented.

This means for 2012/13, non-pensioners in Great Britain are subject to the SPI adjustment if their gross income exceeded £236,694 per year (£131,166 per year in Northern Ireland) and pensioners in Great Britain are subject to the SPI adjustment if their gross income exceeded £73,631 per year (£60,088 per year in Northern Ireland).

The numbers of 'very rich' pensioners and non-pensioners in survey estimates are matched to SPI estimates by the introduction of two extra control totals into the grossing regime. One is for the total number of pensioners above the pensioner threshold and the other for the number of non-pensioners above the non-pensioner threshold. The grossing factors for individual cases are only marginally changed as a result of this adjustment. In addition, each 'very rich' individual in the FRS is assigned an income level derived from the SPI, as the latter gives a more accurate indication of the level of high incomes than the FRS. Again this adjustment is carried out separately for pensioners and non-pensioners.

The estimates using SPI data were provided by HM Revenue and Customs' statisticians. The 2012/13 estimates were projections based on 2011/12 data.

Equivalisation

HBAI uses net disposable weekly household income, after adjusting for the household size and composition, as an assessment for material living standards - the level of consumption of goods and services that people could attain given the net income of the household in which they live. In order to allow comparisons of the living standards of different types of households, income is adjusted to take into account variations in the size and composition of the households in a process known as equivalisation. HBAI assumes that all individuals in the household benefit equally from the combined income of the household. Thus, all members of any one household will appear at the same point in the income distribution.

The unit of analysis is the individual, so the populations and percentages in the tables are numbers and percentages of individuals – both adults and children.

Equivalence scales conventionally take an adult couple without children as the reference point, with an equivalence value of one. The process then increases relatively the income of single person households (since their incomes are divided by a value of less than one) and reduces relatively the incomes of households with three or more persons, which have an equivalence value of greater than one.

Consider a single person, a couple with no children, and a couple with two children aged fourteen and ten, all having unadjusted weekly household incomes of £200 (BHC). The process of equivalisation, as conducted in HBAI, gives an equivalised income of £299 to the single person, £200 to the couple with no children, but only £131 to the couple with children.

In line with international best practice, the main equivalence scales now used in HBAI are the modified OECD scales, which take the values shown in Table 3. The equivalent values used by the McClements equivalence scales are also shown for comparison alongside modified OECD values. The McClements scales were used by HBAI to adjust income up to the 2004/05 HBAI publication.

In the modified OECD and McClements versions two separate scales are used, one for income BHC and one for income AHC. The construction of household equivalence values from these scales is quite straightforward. For example, the BHC equivalence value for a household containing a couple with a fourteen year old and a ten year old child together with one other adult would be 1.86 from the sum of the scale values:

$$0.67 + 0.33 + 0.33 + 0.33 + 0.20 = 1.86$$

This is made up of 0.67 for the first adult, 0.33 for their spouse, the other adult and the fourteen year old child and 0.20 for the ten year old child. The total income for the household would then be divided by 1.86 in order to arrive at the measure of equivalised household income used in HBAI analysis.

Table 3: Comparison of modified OECD and McClements equivalence scales

Equivalence scales				
	OECD rescaled to couple without children=1¹	OECD 'Companion' Scale to equivalise AHC results	McClements BHC	McClements AHC
First Adult	0.67	0.58	0.61	0.55
Spouse	0.33	0.42	0.39	0.45
Other Second Adult ²	0.33	0.42	0.46	0.45
Third Adult	0.33	0.42	0.42	0.45
Subsequent Adults	0.33	0.42	0.36	0.40
Children aged under 14yrs ³	0.20	0.20	0.20	0.20
Children aged 14yrs and over ³	0.33	0.42	0.32	0.34

Notes:

1. Presented here to two decimal places.
2. For the McClements scale, the weight for 'Other second adult' is used in place of the weight for 'Spouse' when two adults living in a household are sharing accommodation, but are not living as a couple. 'Third adult' and 'Subsequent adult' weights are used for the remaining adults in the household as appropriate. In contrast to the McClements scales, apart from for the first adult, the OECD scales do not differentiate for subsequent adults.
3. The McClements scale varies by age within these groups; appropriate average values are shown in the table.

Low income and material deprivation for children

A suite of questions designed to capture the material deprivation experienced by families with children has been included in the FRS since 2004/05. Respondents are asked whether they have 21 goods and services, including child, adult and household items. Together, these questions form the best discriminator between those families that are deprived and those that are not. If they do not have a good or service, they are asked whether this is because they do not want them or because they cannot afford them.

The original list of items was identified by independent academic analysis. See McKay, S. and Collard, S. (2004). [Developing deprivation questions for the Family Resources Survey](#), Department for Work and Pensions Working Paper Number 13. The questions are kept under review and for the 2010/11 Family Resources Survey, information on four additional material deprivation goods and services was collected and from 2011/12 four questions from the original suite were removed.

Table 4.5tr shows figures using the original suite of questions up to and including 2010/11, and the new suite of questions from 2010/11 onwards. 2010/11 data is presented on both bases as figures from the old and new suite of questions are not comparable. Due to the break in the series it is not possible to calculate results for ethnicity or geographical breakdowns for this publication as these require three consecutive years' data.

See [Appendix 3 of the 2010/11 HBAI publication](#) for a discussion of the implications of changing the items.

These questions are used as an additional way of measuring living standards for children and their families, as outlined in the conclusions of the 2003 Measuring Child Poverty Consultation.

A prevalence weighted approach has been used, in combination with a relative low-income or severe relative low-income threshold. Prevalence weighting is a technique of scoring deprivation in which more weight in the deprivation measure is given to families lacking those items that most families already have. This means a greater importance, when an item is lacked, is assigned to those items that are more commonly owned in the population.

For each question a score of 1 indicates where an item is lacked because it cannot be afforded. If the family has the item, the item is not needed or wanted, or the question does not apply then a score of 0 is given. This score is multiplied by the relevant prevalence weight. The scores on each item are summed and then divided by the total maximum score; this results in a continuous distribution of scores ranging from 0 to 1. The scores are multiplied by 100 to make them easier to interpret. The final scores, therefore, range from 0 to 100, with any families lacking all items which other families had access to scoring 100.

A child is considered to be in low income and material deprivation if they live in a family that has a final score of 25 or more and an equivalised household income below 70 per cent of contemporary median income, Before Housing Costs.

A child is considered to be in severe poverty if they live in a family that has a final score of 25 or more and an equivalised household income below 50 per

HBAI Quality and Methodology Information Report

cent of contemporary median income, Before Housing Costs. A [technical note](#) giving further background to this measure is available.

From the 2008/09 edition of the HBAI publication, we moved to using the prevalence weights relative to the survey year in question, rather than fixed 2004/05 weights, which were used in previous publications. The full list of questions, prevalence weights for the latest survey year and final scores are shown below.

Table 4: Material deprivation scores used for children in 2012/13^{1,2}

Material deprivation questions	Weights	Final Scores
For children		
Outdoor space or facilities nearby to play safely	0.904	5.81
Enough bedrooms for every child of 10 or over of a different sex to have their own bedroom	0.874	5.61
Celebrations on special occasions such as birthdays, Christmas or other religious festivals	0.950	6.10
Leisure equipment such as sports equipment or a bicycle	0.851	5.47
A family holiday away from home for at least one week a year	0.591	3.80
A hobby or leisure activity	0.720	4.63
Friends around for tea or a snack once a fortnight	0.662	4.25
Go on school trips	0.873	5.61
Toddler group/nursery/playgroup at least once a week	0.683	4.39
Attends organised activity outside school each week	0.644	4.14
Fresh fruit and vegetables eaten by children every day	0.892	5.73
Warm winter coat for each child	0.970	6.23
For adults		
Enough money to keep home in a decent state of decoration	0.735	4.72
A holiday away from home for at least one week a year, whilst not staying with relatives at their home	0.512	3.29
Household contents insurance	0.686	4.41
Regular savings of £10 a month or more for rainy days or retirement	0.527	3.39
Replace any worn out furniture	0.519	3.34
Replace or repair major electrical goods such as a refrigerator or a washing machine, when broken	0.629	4.04
A small amount of money to spend each week on yourself, not on your family	0.587	3.77
In winter, able to keep accommodation warm enough	0.867	5.57
Keep up with bills and regular debt payments	0.890	5.72
Sum of all weights	15.567	100

Notes:

1. Material deprivation weights are calculated based on responses in the survey year in question.
2. This includes the new items and services first asked about in the 2010/11 FRS.

Material deprivation for pensioners

A suite of questions designed to capture the material deprivation experienced by pensioner families has been included in the Family Resources Survey since May 2008. Respondents are asked whether they have access to 15 goods and services. The list of items was identified by independent academic analysis. See Legard, R., Gray, M. and Blake, M. (2008), [Cognitive testing: older people and the FRS material deprivation questions](#), Department for Work and Pensions Working Paper Number 55 and McKay, S. (2008), [Measuring material deprivation among older people: Methodological study to revise the Family Resources Survey questions](#), Department for Work and Pensions Working Paper Number 54. Together, these questions form the best discriminator between those pensioner families that are deprived and those that are not.

Where they do not have a good or service, they are asked whether this is because:

- they do not have the money for this;
- it is not a priority on their current income;
- their health / disability prevents them;
- it is too much trouble or tiring;
- they have no one to do this with or help them;
- it is not something they want; it is not relevant to them;
- other.

A pensioner is counted as being deprived of an item where they lack it for one of the following reasons:

- they do not have the money for this;
- it is not a priority on their current income;
- their health / disability prevents them;
- it is too much trouble or tiring;
- they have no one to do this with or help them;
- other,

The exception to this is for the unexpected expense question, where the follow up question was asked to explore how those who responded 'yes' would pay. Options were:

- use own income but cut back on essentials;
- use own income but not need to cut back on essentials;
- use savings;
- use a form of credit;
- get money from friends or family;
- other.

Pensioners are counted as materially deprived for this item if and only if they responded 'no' to the initial question.

The same prevalence weighted approach has been used to that for children, in determining a deprivation score. Prevalence weighting is a technique of scoring deprivation in which more weight in the deprivation measure is given to families lacking those items that most pensioner families already have. This

HBAI Quality and Methodology Information Report

means a greater importance, when an item is lacked, is assigned to those items that are more commonly owned in the pensioner population.

For each question a score of 1 indicates where an item is lacked because it cannot be afforded. If the pensioner family has the item, the item is not needed or wanted, or the question does not apply then a score of 0 is given. This score is then multiplied by the relevant prevalence weight. The scores on each item are summed and divided by the total maximum score; this results in a continuous distribution of scores ranging from 0 to 1. The scores are multiplied by 100 to make them easier to interpret. The final scores, therefore, range from 0 to 100, with any families lacking all items which other families had access to scoring 100.

A pensioner is considered to be in material deprivation if they live in a family that has a final score of 20 or more. For children, material deprivation is presented as an indicator in combination with a low-income threshold. However, for pensioners, the concept of material deprivation is broad and very different from low income, therefore it is appropriate to present it as a separate measure. In 2012/13, 13 per cent of pensioners aged 65 or over were in households with equivalised incomes below 60 per cent of the median, After Housing Costs (AHC). This compares to 8 per cent of pensioners aged 65 or over in material deprivation. Just 2 per cent of pensioners were in material deprivation and in low income, based on a threshold of 60 per cent of median, AHC.

The full list of questions, prevalence weights for the latest survey year and final scores are shown below. A [technical note](#) giving a full explanation of the pensioner material deprivation measure is available.

Table 5: Material deprivation scores used for pensioners in 2012/13¹

Material deprivation questions	Weights	Final Scores
For pensioners aged 65 and over		
At least one filling meal a day	0.990	7.28
Go out socially at least once a month	0.761	5.59
See friends or family at least once a month	0.955	7.02
Take a holiday away from home	0.574	4.22
Able to replace cooker if it broke down	0.900	6.61
Home kept in a good state of repair	0.972	7.15
Heating, electrics, plumbing and drains working	0.991	7.28
Have a damp-free home	0.940	6.91
Home kept adequately warm	0.964	7.09
Able to pay regular bills	0.967	7.11
Have a telephone to use, whenever needed	0.963	7.08
Have access to a car or taxi, whenever needed	0.874	6.43
Have hair done or cut regularly	0.901	6.63
Have a warm waterproof coat	0.986	7.25
Able to pay an unexpected expense of £200	0.864	6.35
Sum of all weights	13.600	100

Notes:

1. Material deprivation weights are calculated based on responses in the survey year in question.

Material deprivation weighting methodology

Comments have been made about the methodology used to calculate the prevalence weights for material deprivation items. We currently recalculate the prevalence weights each year based on the question responses from that year. The maximum possible material deprivation score for each year is then rescaled to 100 for ease of interpretation, and children in a family with a score of at least 25, or pensioners with a score of 20 or more, are classed as being materially deprived. If over time more families can afford a certain item, then a family lacking such a good will see an increasing overall deprivation score, and will be considered as becoming more materially deprived.

The concern with the current method is that if there is a general increase in access to items, this should imply that a family lacking a particular number of items is now suffering from greater relative deprivation than before. However, because of the rescaling of scores to 100, each item lacked still counts the same amount towards the overall material deprivation score and a family is still required to lack the same number of items to reach a score of 25 and be declared materially deprived.

The HBAI Technical Advisory Group considered this issue. The Group agreed that this is a complex issue and recommended that any changes made should be implemented following a considered and evidence based exploration of options. As a result, the Group agreed that the recommendation should be to continue to use the current methodology for material deprivation for the 2012/13 publication.

Looking to the future DWP will consider the best way to approach a longer term exploration of options and time scales for reaching a decision on the methodology for the material deprivation measure going forwards.

Income definition

The income measure used in HBAI is weekly net (disposable) equivalised household income. This comprises total income from all sources of all household members including dependants.

Income is adjusted for household size and composition by means of **equivalence scales**, which reflect the extent to which households of different size and composition require a different level of income to achieve the same standard of living. This adjusted income is referred to as **equivalised income**.

In detail, income includes:

- usual net earnings from employment;
- profit or loss from self-employment (losses are treated as a negative income);
- state support - all benefits and tax credits;
- income from occupational and private pensions;
- investment income;
- maintenance payments, if a person receives them directly;
- income from educational grants and scholarships (including, for students, top-up loans and parental contributions);
- the cash value of certain forms of income in kind (free school meals, free school breakfast, free school milk, free school fruit and vegetables, Healthy Start vouchers and free TV licence for those aged 75 and over).

Income is net of the following items:

- income tax payments;
- National Insurance contributions;
- domestic rates / council tax;
- contributions to occupational pension schemes (including all additional voluntary contributions (AVCs) to occupational pension schemes, and any contributions to stakeholder and personal pensions);
- all maintenance and child support payments, which are deducted from the income of the person making the payment;
- parental contributions to students living away from home;
- student loan repayments.

Income After Housing Costs (AHC) is derived by deducting a measure of **housing costs** from the above income measure.

Housing costs

These include the following:

- rent (gross of housing benefit);
- water rates, community water charges and council water charges;
- mortgage interest payments;
- structural insurance premiums (for owner occupiers);
- ground rent and service charges.

HBAI Quality and Methodology Information Report

For Northern Ireland households, water provision is funded from taxation and there are no direct water charges. Therefore, it is already taken into account in the Before Housing Costs measure.

In the 1995/96 and subsequent datasets, a refinement was made to the calculation of mortgage interest payments to disregard additional loans which had been taken out for purposes other than house purchase.

Negative incomes

Negative incomes BHC are reset to zero, but negative AHC incomes calculated from the adjusted BHC incomes are possible. Where incomes have been adjusted to zero BHC, income AHC is derived from the adjusted BHC income.

State support

The Government pays money to individuals in order to support them financially under various circumstances. Most of these benefits are administered by DWP. The exceptions are Housing Benefit and Council Tax Benefit, which are administered by local authorities. Tax Credits are not treated as benefits, but both Tax Credits and benefits are included in the term State Support.

Income-related benefits	Non-income-related benefits
Jobseeker's Allowance (income-based element)	Disability Living Allowance (both mobility and care components)
Income Support	Attendance Allowance
Employment and Support Allowance (income-related element)	Employment and Support Allowance (contributory based element)
Pension Credit	Widow's/Bereavement Payment
Housing Benefit	Child Benefit
Council Tax Benefit	Retirement Pension
Rates Rebate	Widowed Mother's/Parent's Allowance
In Work Credit	Armed Forces Compensation Scheme
Social Fund – Funeral Grant	Incapacity Benefit
Social Fund – Sure Start Maternity Grant	Severe Disablement Allowance
Social Fund – Community Care Grant	Jobseeker's Allowance (contributory based element)
Return to Work Credit	Widow's Pension/Bereavement Allowance
Northern Ireland Rate Relief for full-time students, trainees, under 18s and those leaving care	Carer's Allowance
Northern Ireland Rate Rebate through energy efficient homes	Industrial Injuries Disablement Benefit
Northern Ireland Other Rate Rebate	Statutory Maternity/Paternity/Adoption Pay
Job Grant	Statutory Sick Pay
Extended Payments (Council Tax Benefit and Housing Benefit)	Maternity Allowance
	Guardian's Allowance
	Winter Fuel Payments

HBAI Quality and Methodology Information Report

Income-related benefits	Non-income-related benefits
	Other state benefits
	Health in Pregnancy Grant
	Northern Ireland Disability Rate Rebate
	Northern Ireland Lone Pensioner Rate Rebate

Interpreting low income measures

Relative low income sets the threshold as a proportion of the average income, and moves each year as average income moves. It is used to measure the number and proportion of individuals who have incomes a certain proportion below the average.

The percentage of individuals in relative low income will **increase** if:

- the average income stays the same, or rises, and individuals with the lowest incomes see their income fall, or rise less, than average income; or
- the average income falls and individuals with the lowest incomes see their income fall more than the average income.

The percentage of individuals in relative low income will **decrease** if:

- the average income stays the same, or rises, and individuals with the lowest incomes see their income rise more than average income; or
- the average income falls and individuals with the lowest incomes see their income rise, or fall less, than average income, or see no change in their income.

Absolute low income sets the low income line in a given year, then adjusts it each year with inflation as measured by variants of the RPI. This measures the proportion of individuals who are below a certain standard of living in the UK (as measured by income).

- The percentage of individuals in absolute low income will **increase** if individuals with the lowest incomes see their income fall or rise less than inflation.
- The percentage of individuals in absolute low income will **decrease** if individuals with the lowest incomes see their incomes rise more than inflation.

Income inequality, measured by the Gini Coefficient, shows how incomes are distributed across all individuals, and provides an indicator of how high and low-income individuals compare to one another. It ranges from zero (when everybody has identical incomes) to 100 per cent (when all income goes to only one person).

Before Housing Costs (BHC) measures allow an assessment of the relative standard of living of those individuals who were actually benefiting from a better quality of housing by paying more for better accommodation, and income growth over time incorporates improvements in living standards where higher costs reflected improvements in the quality of housing.

After Housing Costs (AHC) measures allow an assessment of living standards of individuals whose housing costs are high relative to the quality of their accommodation. Income growth over time may also overstate improvements in living standards for low-income groups, as a rise in Housing Benefit to offset higher rents (for a given quality of accommodation) would be counted as an income rise.

HBAI Quality and Methodology Information Report

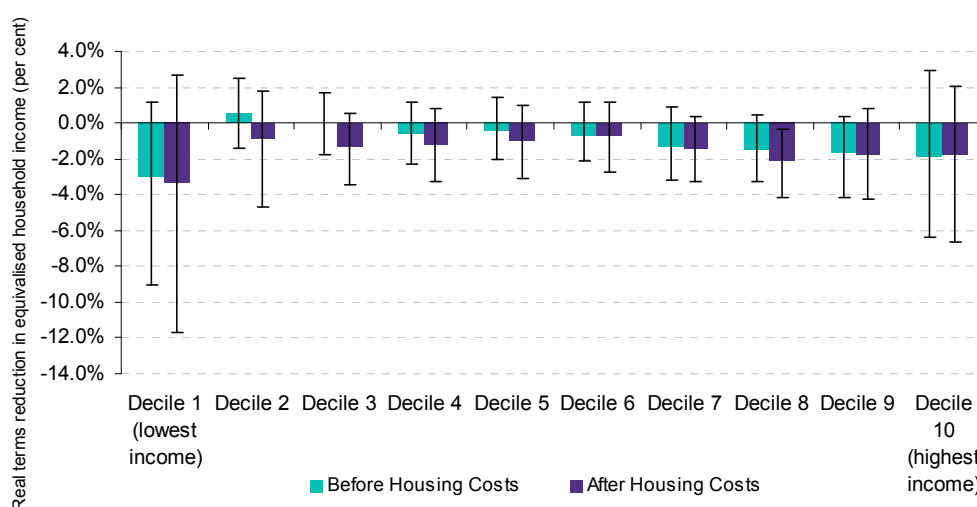
Therefore, HBAI presents analyses of disposable income on both a BHC and AHC basis. This is principally to take into account variations in housing costs that themselves do not correspond to comparable variations in the quality of housing.

Using HBAI

The following issues need to be considered when using the HBAI:

- **Lowest incomes.** Comparisons of household income and expenditure suggest that those households reporting the lowest incomes may not have the lowest living standards. The bottom 10 per cent of the income distribution should not, therefore, be interpreted as having the bottom 10 per cent of living standards. Results for the bottom 10 per cent are also particularly vulnerable to sampling errors and income measurement problems. For HBAI tables, this will have a relatively greater effect on results where incomes are compared against low thresholds of median income. For this reason, compositional and percentage tables using the 50 per cent of median thresholds have been italicised to highlight the greater uncertainty. We have also presented money value quintile medians in Table 2.3ts on three-year averages to reflect this uncertainty.
- Chart A shows the change in average income and associated confidence intervals for each decile in 2012/13.

Chart A: Percentage reduction in incomes in real terms, and confidence intervals, by decile, 2011/12 to 2012/13, UK



- **Adjustment for inflation.** The HBAI uses variants of RPI to adjust for inflation. In January 2013 the National Statistician announced that the formula used to produce the RPI did not meet international standards and recommended that a new index be published (RPIJ) using formulae that meet international standards. In accordance with the Statistics and Registration Service Act 2007, RPI and its derivatives have been assessed against the Code of Practice for Official Statistics and found not to meet the required standard for designation as National Statistics. A full report can be found on the [UK Statistics Authority website](#).

Over the last 10 years (May 2004 to May 2014), the RPIJ 12-month rate has been, on average, 0.5 percentage points lower than the RPI but the difference has increased to an average of 0.7 percentage points

over the last 3 years. Cumulatively, inflation as measured by the RPI is 37.2 per cent over the 10 year period, compared with 30.5 per cent as measured by the RPIJ. The use of the Carli formula (see Box A4a) has therefore added 6.7 percentage points to the change in prices over the last 10 years².

In the 2012/13 HBAI report, figures for trends in income and absolute low income using alternative inflation measures are presented in **Annex 4**.

- **Benefit receipt.** Relative to administrative records, the FRS is known to under-report benefit receipt. However, the FRS is considered to be the best source for looking at benefit and tax credit receipt by characteristics not captured on administrative sources, and for looking at total benefit receipt on a benefit unit or household basis. It is often inappropriate to look at benefit receipt on an individual basis because means-tested benefits are paid on behalf of the benefit unit. DWP published research ([Working Paper 115](#)) which explores the reasons for benefit under-reporting with the aim of improving the benefits questions included within the FRS. Table M.6 of the 2012/13 FRS publication presents a comparison of receipt of state support between FRS and administrative data.
- **Self-employed.** All analyses in this publication include the self-employed. A proportion of this group are believed to report incomes that do not reflect their living standards and there are also recognised difficulties in obtaining timely and accurate income information from this group. This may lead to an understatement of total income for some groups for whom this is a major income component, such as pensioners, although this is likely to be more important for those at the top of the income distribution. There are few differences in the overall picture of proportions in low-income households when analysis is performed either including or excluding the self-employed.
- **Savings and investment** – The data relating to investments and savings should be treated with caution. Questions relating to investments are a sensitive section of the questionnaire and have a low response rate. A high proportion of respondents do not know the interest received on their investments. It is likely that there is some under-reporting of capital by respondents, in terms of both the actual values of the savings and the investment income. This may lead to an understatement of total income for some groups for whom this is a major income component, such as pensioners, although this is likely to be more important for those at the top of the income distribution.
- **Comparisons with National Accounts** – Table 2.1tr shows comparisons between growth in Real Household Disposable Income and real growth in HBAI mean BHC unequivalised income. For some years, income growth in the HBAI-based series appears lower than the National Accounts estimates. The implication of this is that absolute

² http://www.ons.gov.uk/ons/dcp171778_364359.pdf

real income growth could be understated in the HBAI series. Comparisons over a longer time period are believed to be more robust.

- **High incomes** – comparisons with Her Majesty's Revenue and Customs' Survey of Personal Incomes (SPI), which is drawn from tax records, suggest that the FRS under-reports the number of individuals with very high incomes and also understates the level of their incomes. There is also some volatility in the number of high income households surveyed. Since any estimate of mean income is very sensitive to fluctuations in incomes at the top of the distribution, an adjustment to correct for this is made to 'very rich' households in FRS-based results using SPI data. The median-based low-income statistics are not affected.
- **Working status** - DWP and ONS have jointly investigated the reasons for the FRS consistently giving higher estimates than the Labour Force Survey (LFS) of the percentage of children in workless households. A [report](#) on this investigation found that the main reasons for the divergence were:
 - FRS unweighted data identifying a higher proportion of children in lone parent families – who have a much higher worklessness rate - than does LFS;
 - FRS unweighted data showing a higher worklessness rate, in both lone parent and couple with-children families, than LFS;
 - LFS employing a grossing regime which substantially reduces the proportion of children in lone parent households, and thereby in workless households; whereas the FRS grossing regime has less of an effect in reducing these proportions;
 - The LFS grossing regime also reduces the worklessness rate in lone parent families; whereas the FRS grossing regime has less clear-cut effects.

In 2012/13, the FRS data has shown a reduction in the number of working individuals, which is likely to be because of survey volatility as this change is not seen in other survey data sources, such as the Labour Force Survey.

- **Gender analysis.** The HBAI assumes that both partners in a couple benefit equally from the household's income, and will therefore appear at the same position in the income distribution. Research³ has suggested that, particularly in low income households, the assumption with regard to income sharing is not always valid as men sometimes benefit at the expense of women from shared household income. This means that it is possible that HBAI results broken down by gender could understate differences between the two groups.

³ See, for instance, Goode, J., Callender, C. and Lister, R. (1998) Purse or Wallet? Gender Inequalities and the Distribution of Income in Families on Benefits. JRF/Policy Studies Institute.

- **Students.** Information for students should be treated with some caution because they are often dependent on irregular flows of income. They also receive a large proportion of their income from loans, which, with the exception of student loans, are not counted as income in HBAI. The figures are also not necessarily representative of all students because HBAI only covers private households and this excludes halls of residence.
- **Elderly.** The effect of the exclusion of the elderly who live in residential homes is likely to be small overall except for results specific to those aged 80 and above.
- **Ethnicity analysis.** Smaller ethnic minority groups exhibit year-on-year variation which limits comparisons over time. For this reason, analysis by ethnicity is presented as three-year averages.
- **Disability analysis.** No adjustment is made to disposable household income to take into account any additional costs that may be incurred due to the illness or disability in question. This means that the position in the income distribution of these groups, as shown here, may be somewhat upwardly biased. Analysis excluding Disability Living Allowance and Attendance Allowance from the calculation of income has been published on the [HBAI web-site](#).
- **Regional analysis.** Disaggregation by geographical regions⁴ is presented as three-year averages. This presentation has been used as single-year regional estimates are considered too volatile. This issue was discussed in **Appendix 5** of the **2004/05 HBAI publication**, where regional time series using three-year averages were presented. Although the FRS sample is large enough to allow some analysis to be performed at a regional level, it should be noted that no adjustment has been made for regional cost of living differences, as the necessary data are not available. It is therefore assumed that there is no difference in the cost of living between regions, although the AHC measure will partly take into account differences in housing costs.

⁴ Regional information is at [NUTS1](#) level.

Ethnic categories

The ethnicity questions used in the FRS adopt the UK harmonised standards for use in major Government social surveys; that is they adopt the standard way of collecting information on the ways in which people describe their ethnic identity. The latest harmonised standards were published in August 2011 and cover the ethnic group question in England, Wales, Scotland and Northern Ireland. They also cover harmonised data presentation for ethnic group outputs. The standards were updated in February 2013 detailing how Gypsy, Traveller and Irish Traveller should be recorded in the outputs, due to differences across the UK.

The FRS adopted these latest harmonised standards for England, Wales and Northern Ireland for the 2011/12 survey questionnaire, and the standards for Scotland were adopted for the 2012/13 survey questionnaire. The 2011/12 publication therefore adopted the latest harmonised output standards for ethnic group for the UK. The most significant changes to previous publications are that the 'Chinese' category has moved from the 'Chinese or other ethnic group' section to the 'Asian/Asian British' section; an 'Arab' category has been included under 'Other ethnic group' section in the questionnaire, but not shown separately due to only being available for two years; and 'Irish Traveller' is included under 'Other ethnic group' for respondents in Northern Ireland and 'Gypsy or Irish Traveller' is included under the 'White' section for respondents in Great Britain, therefore UK figures have been allocated accordingly.

Disability definition

The means of identifying people with a disability has changed over time. Data are not available for 1994/95. Up until 2001/02 all those who reported having a long-standing limiting illness were identified as having a disability. From 2002/03, statistics are based on responses to questions about difficulties across a number of areas of life. Figures for 2002/03 and 2003/04 are based on those reporting substantial difficulties across eight areas of life and figures from 2004/05 to 2011/12 are based on those reporting substantial difficulties across nine areas of life. In 2012/13 the FRS disability questions were revised to reflect new [harmonised standards](#). Disabled people are identified as those who report any physical or mental health condition(s) or illness(es) that last or are expected to last 12 months or more, and which limit their ability to carry out day-to-day activities a little, or a lot.

FRS questions 2004/05 to 2011/12

The FRS/HBAI definition for an adult with a disability is if they answered **yes** to the 'Health' question and **yes** to any of the difficulties listed in 'DisDif'.

<p>? Health <input type="checkbox"/> Health</p> <p>Do you have any long-standing illness, disability or infirmity? By 'long-standing' I mean anything that has troubled you over a period of at least 12 months or that is likely to affect you over a period of at least 12 months.</p> <p>If 'yes' to Health.</p> <p>? Health Problem Limit Activities <input type="checkbox"/> HProb</p> <p>Does this physical or mental illness or disability (Do any of these physical or mental illnesses or disabilities) limit your activities in any way?</p> <p>If 'yes' to Health.</p> <p>? Health Problems cause Difficulties <input type="checkbox"/> DisDif</p> <p>SHOW CARD E1 Does this/Do these health problem(s) or disability(ies) mean that you have substantial difficulties with any of these areas of your life? Please read out the numbers from the card next to the ones which apply to you. PROBE: Which others?</p> <ol style="list-style-type: none">1. Mobility (moving about)2. Lifting, carrying or moving objects3. Manual dexterity (using your hands to carry out everyday tasks)4. Continence (bladder and bowel control)5. Communication (speech, hearing or eyesight)6. Memory or ability to concentrate, learn or understand7. Recognising when you are in physical danger8. Your physical co-ordination (e.g.: balance)9. Other health problem or disability10. None of these
--

FRS questions 2012/13

The FRS/HBAI definition for an adult with a disability is if they answered **yes** to the 'Health1' and **yes, a lot** or **yes, a little** to the 'Condition' question.

<p>🕒 Longstanding illness or disability</p> <p>📄 Health1</p> <p>Do you have any physical or mental health conditions or illnesses lasting or expected to last for 12 months or more?</p> <ol style="list-style-type: none">1. Yes2. No3. Don't know (spontaneous)4. Refusal (spontaneous) <p>If 'yes' to Health1.</p> <p>🕒 Health Problems cause Difficulties</p> <p>📄 Dis1</p> <p>SHOW CARD E1</p> <p>Do any of these conditions or illnesses affect you in any of the following areas?</p> <ol style="list-style-type: none">1. Vision (for example blindness or partial sight)2. Hearing (for example deafness or partial hearing)3. Mobility (for example walking short distances or climbing stairs)4. Dexterity (for example lifting and carrying objects, using a keyboard)5. Learning or understanding or concentrating6. Memory7. Mental Health8. Stamina or breathing or fatigue9. Socially or behaviourally (for example associated with autism, attention deficit disorder or Asperger's syndrome)10. Other11. Refusal (spontaneous) <p><i>Ask if Health1=Yes</i></p> <p>🕒 Limiting longstanding illness</p> <p>📄 Condition</p> <p>Does your condition or illness/do any of your conditions or illnesses reduce your ability to carry-out day-to-day activities?</p> <ol style="list-style-type: none">1. Yes, a lot2. Yes, a little3. Not at all <p>INTERVIEWER: Day to day activities include washing and dressing, household cleaning, cooking, shopping for essentials, using public or private transport, remembering to pay bills, lifting objects from the ground or lifting objects from a work surface in the kitchen.</p>

Comparisons over time

Compared to 2011/12 the number of individuals in disabled families went up by 0.2m in 2012/13 (similar to those in non-disabled families).

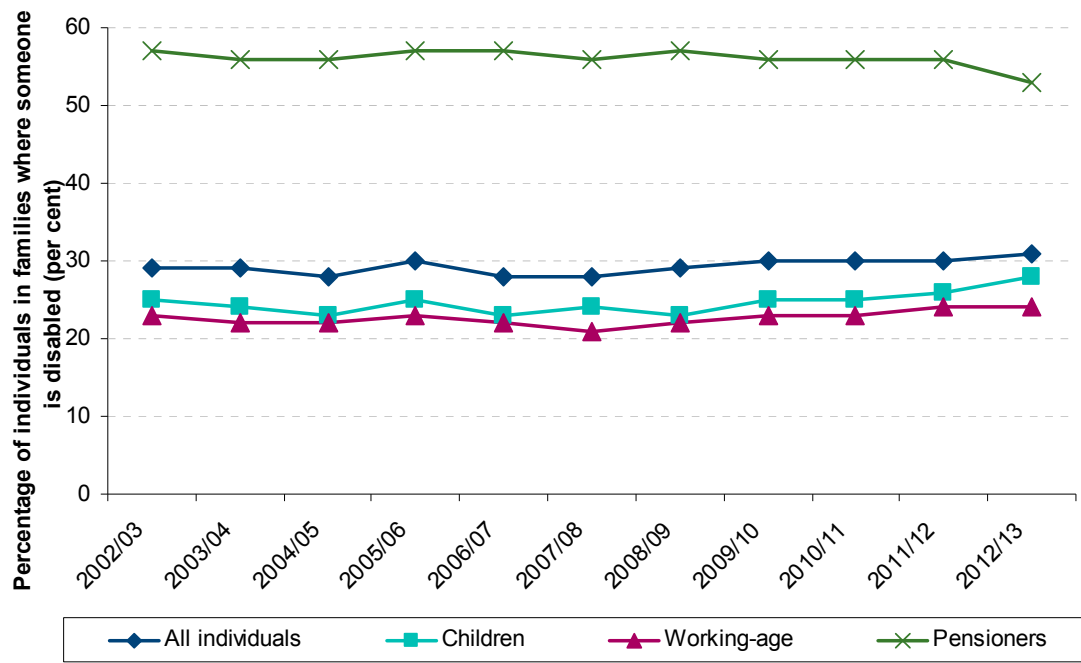
However, while the number of pensioners in non-disabled families increased by 0.4m, the number in disabled families decreased by 0.3m.

The reverse was true for the number of children in disabled families, which increased by 0.3m, while those in non-disabled families fell by 0.2m.

These figures could be affected by the change in the disability questions. Individuals might have different interpretations of particular health conditions or question wording meaning that changes to the disability question may have

had a different effect on certain groups. Therefore, comparisons between the 2012/13 figures in this report and past data should be made with caution, as they may be affected by the change in the definition of disability.

Percentage of individuals in families where someone is disabled, 2002/03 to 2012/13, UK



Comparison with EU low-income statistics

For the 2012 statistics, the production of the UK's European comparable low-income figures were brought into the Department for Work and Pensions from the Office for National Statistics. This move was made for a number of reasons:

- It improves the comparability of the EU-wide low-income statistics with the HBAI statistics used for numerous indicators.
- It makes better use of Government resources, as a single survey now provides both figures for the HBAI statistics and those aligned with European standards. Previously two surveys were required.
- The move improves the quality of the low-income estimates, using the most comprehensive source of income data available in the UK, the Family Resources Survey.
- The UK contributes to the EU target of reducing poverty or social exclusion by aiming to lift at least 20 million people across Europe out of the risk of poverty or social exclusion. Progress against these targets will be measured in 2020, as such we have made the change at this stage so we have a consistent time series from 2012 onwards to measure progress against this target.

Despite the UK's cross European comparable low-income statistics now being derived from the Family Resources Survey, the same source as the HBAI, the figures will differ for a number of reasons:

- **Time period:** The figures are presented on different timescales, the HBAI figures are presented for the financial year, while the EU comparable figures are presented for the calendar year.
- **Population groups:** The European low-income statistics are presented in different age groups than the HBAI figures:
 - **children:** the EU figures relate to those under 18 – HBAI figures are based on individuals aged under 16, in addition a person will also be defined as a child if they are 16 to 19-years old and they are not married nor in a Civil Partnership nor living with a partner; are living with parents; and are in full-time non-advanced education or in unwaged government training;
 - **pensioners:** EU figures relate to the 65+ population – HBAI figures include women aged 60 to 64 who are above State Pension age;
- **Preferred measures:** All the European low-income estimates are presented on a Before Housing Costs Basis, while this is consistent with the most commonly used measure for working age adults and children, we choose to look at pensioners' incomes after deducting housing costs as this better reflects pensioner living standards compared to others and over time.

- **Income derivation:** The definition of income in the European figures differs from the official UK figures:
 - Pension contributions are not deducted from income in the European comparable methodology.
 - The European definition of income includes the value of non-cash employee income from company cars as employee income, which will raise the average income of people in work. This may have an upward pressure on relative poverty rates compared with HBAI figures;
- **High income adjustment:** For the HBAI figures an adjustment is made to sample cases at the top of the income distribution to correct for volatility in the highest incomes captured in the survey. This adjustment is not applied to the European figures.
- **In year deflation:** The HBAI estimates make an in year adjustment to individuals incomes to ensure that respondents income collected across the financial year are comparable. This adjustment is not applied to the European figures.
- **Sample cases:** The HBAI figures exclude cases containing a married adult whose spouse is temporarily absent whereas these are included in the European figures, however this has a minimal effect on the figures.
- **Income tax and national insurance:** The European income tax and national insurance figures are calculated using a model of taxation, whilst the HBAI estimates are mostly calculated on the amount of tax and national insurance reported as being paid.

A description of how levels of low income in the UK compare with other EU countries is available at:

http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/3-05122013-AP/EN/3-05122013-AP-EN.PDF

http://epp.eurostat.ec.europa.eu/portal/page/portal/income_social_inclusion_living_conditions/data/main_tables