



Department
for Work &
Pensions

Fraud and Error in the Benefit System:

Technical Appendix for Calculation of Fraud and Error Estimates

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Executive Summary

This technical appendix is a companion volume to the 'Fraud and Error in the Benefit System' National Statistics, published every six months. It gives background to the fraud and error measurement methodology for the continuously reviewed benefits:

- Housing Benefit
- Jobseeker's Allowance
- Employment and Support Allowance
- Pension Credit
- Universal Credit
- Personal Independence Payment

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1. Sampling and Data Collection

- 1.1 The Fraud and Error checking process consists of a review of claimant circumstances, followed by the recording of review outcomes. There are two stages of this review: a desk-based review using Departmental computer records, followed by a notified review to check whether claim details and the claimants needs are still accurate. Depending on the benefit, the review will involve home visits and/or telephone interviews.
- 1.2 Since it is not possible to review every benefit claim, we use a representative sample of cases. Cases to be reviewed are randomly selected, often from a group of local authorities which we call Primary Sampling Units (PSU).

Benefit	Sampling Methodology	
Jobseeker's Allowance Employment and Support Allowance Pension Credit Personal Independence Payment	Randomly selected from PSU groups. There are two "hard to reach" Local Authorities that we never sample: Outer Hebrides and Shetland Islands There are Rotationally Sampled Local Authorities which are only sampled at least once in a three year period. Further details are available in the Background and Methodology document.	
Housing Benefit	Randomly selected from PSU groups and stratified into four types: <ul style="list-style-type: none"> • Working Age in receipt of IS, JSA, ESA or PC • Working Age not in receipt of IS, JSA, ESA or PC • Pensioners in receipt of IS, JSA, ESA or PC • Pensioners not in receipt of IS, JSA, ESA or PC 	
Universal Credit	Sampled randomly from the cases live on the system each month, with no geographical groups, as reviews are completed via telephone	

- 1.3 Cases are randomly selected on a monthly basis from data extracts of the administrative systems. The samples are taken from systems in advance of the scheduling of claimant reviews, to give time for the sample to be checked and for background information to be gathered on each case.
- 1.4 The population from which the samples are drawn are the claims that are live in a particular assessment period, where the assessment period is the month prior to

the last payment. If for any reason the review is delayed, the assessment period rolls onto the next month. The cases in payment form the full review sample and would potentially be checked for Official Error (OE), Claimant Error (CE) and Fraud, unless they are abandoned.

- 1.5 There have been two changes to sampling methodology during 2017/18 – the introduction of rotational sampling, and a pilot of desk-based reviews for Housing Benefit. These are outlined below, and more detail is contained in the Background and Methodology document.
- 1.6 Rotational sampling has been introduced, for data collection between April 2017 and September 2019, so that a selection of hard to reach areas will only be selected within the sample at least once in a three year period.
- 1.7 Desk-based reviews for the working age passported Housing Benefit client group have been piloted during the period April 2017 to September 2018. The evaluation of the pilot concluded that face to face reviews should continue to take place for this client group. This means that this publication is therefore based solely on face to face review cases. In addition, the sample size is smaller for this client group, and the confidence intervals may be wider than in previous years.

Abandoned Cases

- 1.8 Of the cases sampled, there are some that have to be explicitly excluded from the sample of cases that can be reviewed according to strictly defined criteria for abandonment. Cases that fall into this category could include:
 - The claimant reports a change of circumstances that ends their award before the interview can take place
 - The case has been reviewed in the last six months.
 - If the claimant or their partner is terminally ill.
 - PIP cases with a new award or an intervention/case review within three months of the sample date
- 1.9 When such cases occur in the sample, they are replaced by another case, from a reserve list. However, for a small number of abandoned cases replacement is not possible for practical reasons.

Claimant Error and Fraud Reviews

- 1.10 For all benefits, benefit review officers normally check for claimant error (CE) or fraud by comparing the evidence obtained from the review to that held by the Department.
- 1.11 The claimant may not be interviewed if:
 - The case is already under an ongoing fraud investigation;
 - A suspicion of fraud arises while trying to secure an interview;
 - The claimant reports a change of circumstances that materially alters their claim award before the interview can take place.
- 1.12 When such cases occur in the sample, they are replaced by another case.

- 1.13 **Claimant Error:** The claimant has provided inaccurate or incomplete information, or failed to report a change in their circumstances, but there is no fraudulent intent on the claimant's part.
- 1.14 **Fraud:** This includes all cases where the following three conditions apply:
- the conditions for receipt of benefit, or the rate of benefit in payment, are not being met;
 - the claimant can reasonably be expected to be aware of the effect on entitlement;
 - benefit stops or reduces as a result of the review

Causal Link

- 1.15 Cases where there is a change to the claimant's award as a result of the review activity or, after initial contact the claimant subsequently fails to engage in the review process, are categorised as Claimant Fraud with causal link. Action is taken to suspend their payment and subsequently terminate their claim.
- 1.16 Examples of behaviours that can trigger Causal Link include;
- The claimant receives notification of the review and subsequently contacts the service centre to report an immediate change (e.g. living with a partner, starting work, self-employment or capital changes). Then supporting evidence needed to verify the change is not provided, resulting in claim suspension and termination.
 - The claimant completes the review but subsequently declares that a change has happened following the period of the review.
 - The claimant receives notification of the review and does not engage in the review process or contacts the service centre with a request to withdraw their claim.
 - The claimant completes a review and a change is declared, however supporting evidence needed to verify the change is not returned, resulting in claim suspension and termination.

For UC there are cases where the claimant fails to engage in the review process, but there is supporting evidence that a change is not due to the review. These are categorised as mitigating circumstances. For these cases, information is available on our systems to indicate why the person may not have engaged. In most cases, they have moved into paid work following the Assessment Period under review.

Official Error Checking

- 1.17 Official error (OE) is where benefit has been paid incorrectly due to inaction, delay or a mistaken assessment by the DWP, a Local Authority or Her Majesty's Revenue and Customs, to which no one outside of that department has materially contributed, regardless of whether the business unit has processed the information.
- 1.18 In addition, an error, which is initially categorised as claimant error, will be categorised as official error where the error has clearly been caused by an official of the Department/LA and the ESA/JSA/HB business unit, or for PC, the pension

centre is in possession, from whatever source, of the true facts, regardless of whether the information has been processed by the business unit.

- 1.19 Cases are checked for official payment errors within a specified sample week. For UC this is the assessment period of one month prior to the last payment (or the date payment was due if no payment is made).
- 1.20 Specially trained DWP benefit review officers carry out the checks. The claimant's case papers and DWP computer systems are checked to determine whether the claimant is receiving the correct amount of benefit according to their presented circumstances. This identifies any errors made by DWP officials in processing the claim, and helps prepare for the next stage: a telephone or face-to-face review of circumstances with the claimant.
- 1.21 A full review is not completed on every case. There are two types of OE only samples within the measurement:
 - If a case is abandoned for particular circumstances then we can still complete an OE check on the case. A sample of abandoned cases is taken to complete these checks for all benefits except HB and UC.
 - For State Pension, OE checks are conducted on the entire sample. No further fraud or error checks are carried out.

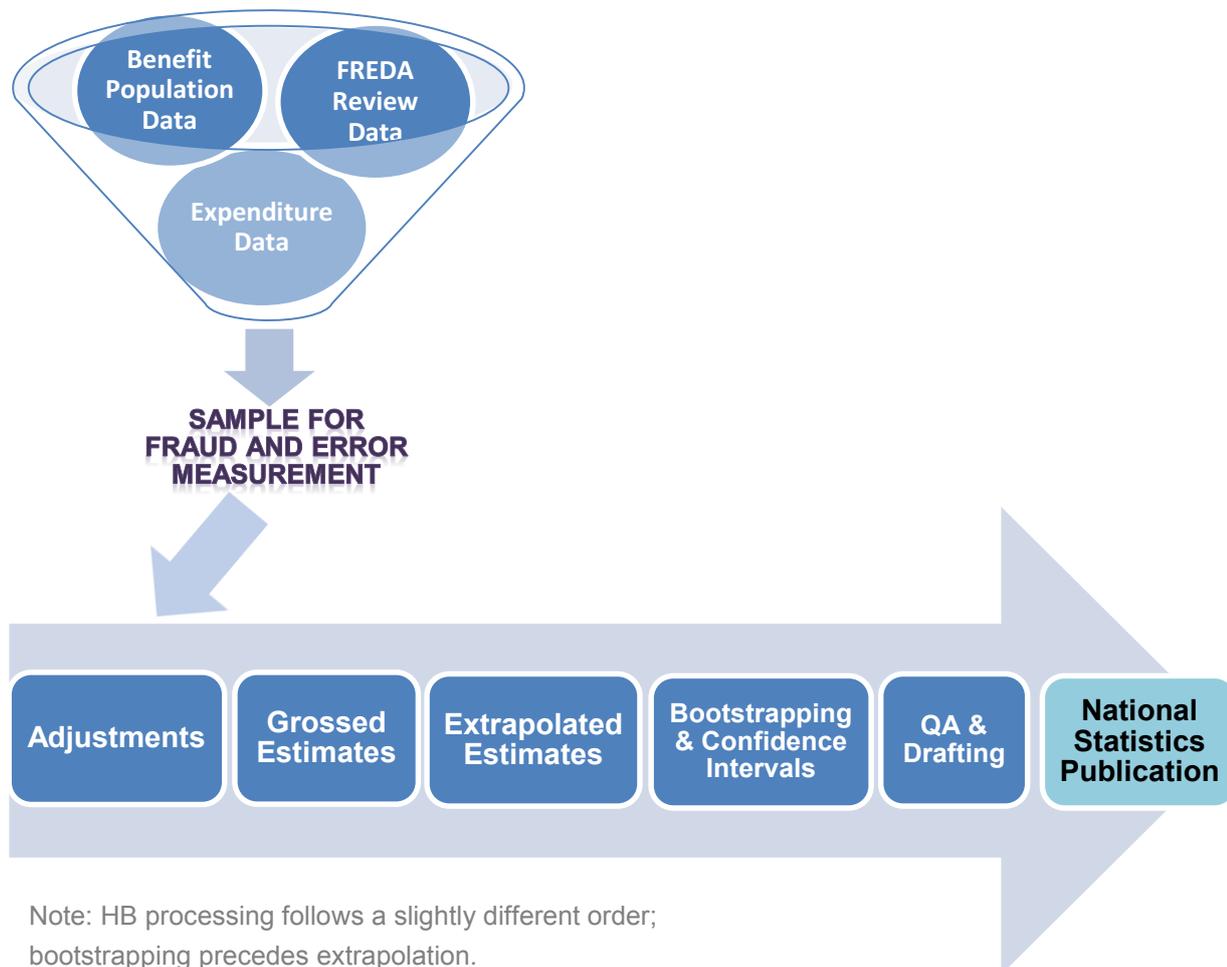
Procedural errors

- 1.22 Some failures by DWP staff to follow procedures are not counted as official errors, where the failure does not have a financial impact on the benefit award for the assessment period (or any other period), or where the office have failed to take action which could have prevented a claimant error from occurring. An example of a procedural error is where the review officer finds that a claimant is not legally entitled to benefit, because the office has not verified their identity before paying benefit in the sample period.
- 1.23 Accounting errors are also excluded from the estimates. These are errors where, despite an error in the claimant's benefit, an overpayment/underpayment of the benefit undergoing a check could be offset against any corresponding underpayment/overpayment of another benefit.

Recording Information

- 1.24 Case details relating to the fraud and error reviews are recorded on bespoke 'Fraud and Error' software, known as FREDa, to create a centrally held data source. This can then be matched against our original sample population to produce a complete picture of fraud and error against review cases across our sample.

2. Measurement Calculation Methodology



2.1 Fraud and error measurement relies on three data sources:

- **Raw Sample** held on 'FREDA' (the database on which the review outcomes are recorded), is used to identify the monetary value of fraud and error (MVFE) for individual cases, categorise its cause and quantify as a proportion of the sample
- **Benefit Population data**, to estimate the extent of fraud and error across the whole claimant caseload from the sample data.
- **Expenditure data**, to estimate the total monetary value of fraud and error to the Department.

2.2 Estimates are categorised into overpayments (OP) and underpayments (UP) and one of three incorrectness types, Fraud, CE or OE. Further sub-categories of error reasons are used to provide more details about the nature of the fraud or error. A glossary of error classifications can be found in the Background and Methodology document.

- 2.3 Detailed below are the main calculation steps that the Fraud and Error Measurement Analysis (FEMA) team carry out to produce the final fraud and error estimates.

Adjustments

- 2.4 A series of adjustments are made to the sample data, to allow for various characteristics of the benefits and how their data is collected and recorded. The following table highlights which adjustments apply to each benefit:

Adjustment	Benefit					
	JSA	ESA	PC	HB	UC	PIP
Netting and Capping	✓	✓	✓	✓	✓	✓
Net Programme Value	✓	✓	✓	-	✓	-
Estimated Outcomes	✓	✓	✓	✓	✓	-
New Cases Factor	✓	✓	✓	✓	-	-
Underlying Entitlement	-	-	-	✓	-	-
Arrears and Advance payments	-	-	-	✓	-	-
Cannot Review Cases	-	-	-	-	✓	-
Reasonably Expected to know	-	-	-	-	-	✓

- 2.5 Adjustments common to more than one benefit are outlined below and further benefit specific detail can be found in [appendices 3-6](#).

Netting and Capping

- 2.6 Where a case has more than one error, then these errors can be netted off against one another to produce a total value. For example, if a case is found to have two different OE's, one leading to an UP and one leading to an OP, then these are 'netted' off to produce a single OP or UP. This is done to better represent the total monetary loss to the public purse (via OP's) or to the claimant (via UP's).
- 2.7 The monetary loss on each case is the difference between the case award paid at the review/assessment period, and the correct award calculated following the review – the "award difference".
- 2.8 A case may have OP's of more than one 'type' which sum to a total greater than the award difference. To ensure that the total OP does not exceed the total award difference, we 'cap' the OP amount using a hierarchy order of CF, CE then OE. This capping process means that a small proportion of CE and OE found during the survey is not included in the estimates and therefore the final estimates may actually be under-reporting CE and OE in the benefit system.

Net Programme Value (NPV)

- 2.9 The principle of NPV is to identify where, as a result of the review, a claimant moves onto a different benefit or becomes a different client type on the same

benefit. The process is designed to provide a more accurate estimate of the actual loss from public funds as a result of fraud and error than the initial estimate.

- 2.10 This is achieved by considering whether the claimant then claims another benefit to replace the one being checked, or claims the same benefit again, or claims for a partner who was receiving a benefit in their own right to which they are no longer entitled, or who is 'claimed for' by a partner on the same or another benefit.
- 2.11 In these cases a more accurate indication of the loss or underpayment to public funds would be to "offset" the two benefits. This is used as a proxy for an actual difference in entitlements.
- 2.12 It is recognised that the methodology in this area is subject to at least the following limitations:
- Offsetting of entitlement is limited to subsequent claims for UC, JSA, ESA and PC. Thus a subsequent claim to Carer's Allowance would not be offset against the original claim.
 - Entitlement to an alternative benefit in the sample period or claimant review week/assessment period is approximated by tracking cases to see if they make subsequent claims rather than relying only on an assessment of the claimant's circumstances.
 - The tracking of cases to pick up subsequent claims is limited to six weeks after the original claim is terminated.
- 2.13 The netted and capped OP and UP values are adjusted to take into account the full value of the NPV.

Estimated outcomes

- 2.14 For all continuously reviewed benefits (with the exception of PIP), for a number of cases the review process had not been completed at the time of the analysis and production of results, often because fraud investigations are still to be completed. Predictions for the final outcomes for these cases have been made in the analysis using either the review officer (RO) estimation of the most likely outcome, or the results from the reviews of similar cases that had been completed.

New Cases Factors

- 2.15 New Cases Factors are an adjustment to help to ensure that the durations on the sample accurately reflect the duration on benefit within the population.
- 2.16 As a result of the time required to collect the information needed to review a case, as well as other operational considerations, there is an unavoidable delay between sample selection and case review. This delay means that fewer low duration claims will be represented in the sample of cases; and artificially introduces a bias around claim durations at the point of interview.

Grossing

- 2.17 Grossing is the term used to describe the creation of population estimates from the sample data; sample results are scaled up to be representative of the whole population.

Example of a simple grossing factor:

$$G = \frac{N}{n} = \frac{1000}{100} = 10$$

Where N is the population or sampling frame from which the cases are selected and n is the sample size taken.

- 2.18 The above grossing factor shows that if we were to sample 100 cases from a population of 1,000, then each case would have a grossing factor of 10 i.e. each sample case represents 10 cases from the population. Hence if a case was shown to be in error, this would represent 10 errors once grossed.
- 2.19 Grossing factors are different for each benefit due to the sample, population and adjustments made. More benefit specific detail on grossing can be found in [appendices 3-6](#).

Percentage overpaid and underpaid

- 2.20 The grossing factors are then applied to the sample data to calculate values for the grossed awards, the grossed overpayments and grossed underpayments i.e. these are scaled up proportionally to what we would expect to find in the population. In turn the sum of which are used to calculate the total annual percentage overpaid and underpaid.

Monetary Value of Fraud and Error (MVFE)

- 2.21 To then calculate the MVFE across the benefits, we apply the OP or UP percentages to the total expenditure for each benefit.

$$\begin{aligned} \text{OP (£) Annual} &= \% \text{ OP} * \text{Expenditure Annual} \\ \text{UP (£) Annual} &= \% \text{ UP} * \text{Expenditure Annual} \end{aligned}$$

- 2.22 This means that the MVFE is affected by the increases and decreases in expenditure even if the OP and UP percentages are stable.

Extrapolation

- 2.23 The grossed results provide a core estimate of levels of fraud and error. Due to how and when the data is sampled, there are various reasons why bias may be introduced and where areas of a benefit population may not be fully represented in the sample, including cases outside the scope of the original sample. This is accounted for by applying separate estimations and assumptions which also feed

into the central estimate calculations. Details of methods used for each benefit are in [appendices 3-6](#).

Central Estimates and Confidence Intervals

- 2.24 The central estimates produced following extrapolation are based on reviews of random samples and hence are subject to variability. Therefore confidence intervals are provided with the central estimates to highlight the sampling variability.
- 2.25 The confidence intervals are obtained by using a bootstrapping technique where the cases are re-sampled with replacement, and a new estimate of the MVFE calculated. This resample-and-recalculate process is repeated many times and the resulting data and distribution is then used to create the 95% confidence interval. For more details please see the 'Fraud and Error - Variance and Confidence Intervals' document.
- 2.26 The central estimates and confidence intervals are incorporated into the Global (overall) Estimates of Fraud and Error. These combine all separate DWP benefits to calculate an overarching set of Fraud, Claimant Error and Official Error rates for overpayments and underpayments. See section 3 on Measurement of Total Overpayment and Underpayments.

Incorrectness

- 2.27 The main published figures include fraud and error as a percentage of expenditure, and the associated MVFE. We also calculate figures on incorrectness. These are calculated as the proportion of cases in the sample with any incorrectness (overpayment or underpayment, regardless of magnitude).
- 2.28 Incorrectness estimates are published in the 'Supplementary Tables'.

Gender and Age Breakdowns

- 2.29 For HB, JSA, ESA and PC, and within each fraud, claimant error and official error type, we also produce more detailed breakdowns of the over/underpayment rates and monetary values by gender and age (available for 2011/12 onwards).
- 2.30 We use three main sources of data to calculate these figures:
- Most up-to-date National Statistics caseloads and average weekly awards for HB, JSA, ESA and PC by age and gender;
 - Finalised fraud and error central estimates by gender and age for each error type;
 - Benefit expenditure.
- 2.31 Caseloads and average weekly awards from the relevant National Statistics are used to weight total benefit expenditure by gender and age group. The finalised central estimates for each age group and gender= are then divided by their

respective expenditure totals to calculate the percentage of total expenditure being over or underpaid for the group.

- 2.32 Age breakdowns for each benefit match those found within their respective National Statistics publications. Some age and gender groups have a small number of sampled cases within the group. These age and gender groups have either been combined or omitted.
- 2.33 Detailed age and gender data is published in the 'Supplementary Tables' that can be found at: <https://www.gov.uk/government/collections/fraud-and-error-in-the-benefit-system>

3. Measurement of Total Overpayment and Underpayments

Data Collection

- 3.1 Fraud and Error data is drawn from the continuous measurement exercise in JSA, PC, ESA, UC, PIP, HB and the continuous measurement of official error in SP.
- 3.2 This is supplemented with data from occasional measurement exercises, such as a one-off exercise called a National Benefit Review (NBR) or from the refinement of latest available estimates where continuous measurement has stopped.
- 3.3 Estimates are produced by statistical analysis of data collected through on-going survey exercises. Independent and specially trained staff from the Department's Performance Measurement team review randomly selected samples of cases throughout each year.
- 3.4 Benefits included within the expenditure data that have not been subject to a measurement exercise are included in the unreviewed benefits section of the statistics.
- 3.5 A further measure of fraud due to method of payment by Simple Payment is included. We also have an estimate of Interdependencies, the knock on effect of Disability Living Allowance (DLA) fraud and error on other benefits, where receipt of DLA or PIP is a qualifying condition. This is only included within the overpayments calculation and not the underpayments.
- 3.6 A full list of which benefits are in scope for each release of the Fraud and Error in the Benefit system estimates, are included within Appendix 3 of the Background information and methodology document accompanying each report.

Methodology for Unreviewed Benefits

- 3.7 Taken together, all of the continuously reviewed benefits account for approximately 84% of the total benefit expenditure (including Official Error only checks on State Pension). Unreviewed benefits account for 7% of the total.
- 3.8 Estimates for unreviewed benefits are created using a common model. Examination of the qualification conditions and administrative structure suggests that benefits belong in "families" of similar benefits. For example, DLA and Attendance Allowance (AA) are very similar benefits that belong to the same family.
- 3.9 All unreviewed benefits that sit in the same family as a reviewed benefit are assigned the same rate of fraud and error, in percentage terms, as the reviewed benefit. Unreviewed benefits that are in families that do not contain a reviewed benefit are assigned the average rate of fraud and error, in percentage terms, of all reviewed benefits.

- 3.10 For each of the unreviewed benefits, we apply the estimated percentage of fraud and error to the expenditure on that benefit to get an estimate of the cash value of fraud and error.

Central Estimate and Confidence Intervals

- 3.11 The percentage estimate is the sum of the monetary value for all reviewed and unreviewed benefits, method of payment and interdependencies divided by the overall expenditure. This is done independently for fraud, claimant error, official error and the overall fraud and error.
- 3.12 This process is used to calculate the percentage estimates for the 95% confidence interval. Some adjustments are made to the individual benefits before this is calculated.
- Confidence intervals are widened for the unreviewed benefits, whereby the standard error is assumed to be 40% of the central estimate.
 - Confidence intervals for occasionally reviewed benefits (eg: NBR exercises) and any exercise lacking a data quality adjustment (such as official error only exercises) are deliberately widened. This is because the levels of fraud and error may not be as accurate. Exercises without any data quality adjustments do not correct for measurement error.
 - The method of payment fraud exercise does not contribute to the confidence interval because it is not a sampling exercise.
 - To reflect the additional uncertainty of the interdependencies these are widened from those of the DLA exercise.

Calculation of the Total Net Overpayments

- 3.13 Recoveries refer to money recovered in the same financial year as the overpayment estimates, regardless of the period the debt is from. They include debt recovered by both the Department and Local Authorities (who administer Housing Benefit payments).
- 3.14 Within the Preliminary estimates the recovery data for Housing Benefit covers the period October – September, because there is a lag on the data being available. This is updated in the Final estimates to cover the same financial period (i.e. the full financial year).
- 3.15 Some recoveries have no associated overpayments for the same period, as these benefits are no longer administered by the Department. This is because the debt relates to expenditure from previous years.
- 3.16 As the definitions of error classification differ between overpayments and recoveries, the net loss estimate can only be calculated at the overall fraud and error level.
- 3.17 At benefit level, for the continuously and occasionally reviewed benefits, the monetary value of the net loss is calculated by subtracting the value of the recovery from the monetary value of the overpayment. The percentage estimate is then calculated by dividing the monetary value of the net loss by the expenditure.

- 3.18 The unreviewed category calculates the net loss for those benefits which have an associated benefit within the unreviewed category of the overpayments.
- 3.19 The overall net loss estimate includes the reviewed, unreviewed and recoveries for which there is no overpayment.
- 3.20 As the recoveries are actual values rather than estimates, it does not affect the uncertainty around the estimates
- 3.21 The percentage net loss confidence limits are therefore defined as the Net Upper/Lower confidence limit divided by the expenditure. This is calculated independently for each benefit as well as the overall net loss.

4. Data Quality and Interpretation of the Results

Data Quality

- 4.1 Quality assurance is carried out on all of the survey data. The initial quality focus is to make sure that there are enough completed sample survey cases. Subsequent quality assurance examines individual fields in detail to ensure that any unexpected changes or data values are understood and represent genuine changes.
- 4.2 The main quality assurance steps are summarised below:
- An independent team of expert checkers re-perform a sample of completed cases before any statistical analysis is carried out on the data. This evidence is used as a feedback mechanism for the sample survey staff and also to improve the quality of the statistical analysis.
 - Accredited peers fully re-perform checks on most error cases, some correct cases and most abandoned cases.
 - Checking team managers carry out validation, particularly on fraud referrals and causal link categorisations.
 - Administrative teams carry out data entry checks.
 - Analysts in Data and Analytics Directorate run automatic validation rules to identify inconsistencies on the database.
 - Specific validation exercises may be conducted if checks identify a particular problem.
 - Checks on the volume of cases to keep on track and make sure there are enough completed cases for analysis.
 - A check of file size and characteristics to make sure they are in line with expectations, together with checks of any logs generated by computer programs.
 - Analysts run detailed quality assurance (QA) on the raw data such as: analysis of the new dataset against previous datasets, looking for changes in means, levels of change in each data item, the incidence of missing values and changes in categorical variables.
 - As analysts create the finished data source at the end of each stage, they run a set of detailed QA to ensure that the processing has maintained the integrity of the database. They produce tabulations and compare the outputs with those generated during the last report.
 - A small group of DWP fraud and error experts look at the statistics from an operational and policy point of view to ensure that any unexpected changes or data values are understood and represent genuine changes.
 - The final report and tables are prepared and checked independently by members of the team and signed off by the responsible analysts.
- 4.3 For more information on the methods used to produce these estimates and how they are quality assured, please see the 'Quality Methods' document.

Interpretation of the Results

4.4 Care is required when interpreting the results presented in the main report:

- The estimates are based on a random sample of the total benefit caseload and are therefore subject to statistical uncertainties. This uncertainty is quantified by the estimation of 95% confidence intervals surrounding the estimate. These 95% confidence intervals show the range within which we would expect the true value of fraud and error to lie
- When comparing two estimates, users should take into account the confidence intervals surrounding each of the estimates. The calculation to determine whether the results are significantly different from each other is complicated and takes into account the width of the confidence intervals. We perform this robust calculation in our methodology and state in the report whether any differences between years are significant or not.
- None of the changes over time for continuously reviewed benefits are statistically significant at a 95% level of confidence, unless specifically stated within the chart and table commentary. If changes are not statistically significant then they are likely to be due to sampling variation.

4.5 As well as sampling variation, there are many factors that may also impact on the reported levels of fraud and error and the time series presented.

- **These estimates are subject to statistical sampling uncertainties.** All estimates are based on reviews of random samples drawn from the benefit caseloads. In any survey sampling exercise, the estimates derived from the sample may differ from what we would see if we examined the whole caseload. Further uncertainties occur due to the assumptions that have had to be made to account for incomplete or imperfect data or using older measurements.
- **A proportion of continuously reviewed benefit expenditure cannot be captured by the sampling process.** This is mainly because of the delay between sample selection and the interview of the claimant, and also the time taken to process new benefit claims, which excludes the newest cases from the review. The estimates in the tables in this release have been extrapolated to cover all expenditure. We consider that the remaining unquantifiable uncertainty from this source is relatively small.
- **The estimates do not encompass all fraud and error.** This is because fraud is, by its nature, a covert activity and some suspicions of fraud on the sample cases cannot be proven. For example, unreported earnings in the informal economy will be much harder to detect than those in the formal economy. Complex official error can also be difficult to identify.
- **Some incorrect payments may be unavoidable. The measurement methodology will treat a case as incorrect, even where the claimant has promptly reported a change and there is only a short processing delay.**

- 4.6 For more information regarding sampling uncertainties and interpreting confidence intervals please refer to the below document published in “Fraud and Error Measurement – Variance and Confidence Intervals” at:
<https://www.gov.uk/government/publications/fraud-and-error-in-the-benefit-system-supporting-documents-for-statistical-reports>

Appendix 1: Glossary of abbreviations

AA	Attendance Allowance
CA	Carer's Allowance
CE	Claimant Error
CF	Claimant Fraud
DLA	Disability Living Allowance
DWP	Department for Work and Pensions
ESA	Employment and Support Allowance
FEMA	Fraud and Error Measurement and Analysis
FIS	Fraud Investigation Service
GF	Grossing Factor
HB	Housing Benefit
IB	Incapacity Benefit
IS	Income Support
JSA	Jobseeker's Allowance
LA	Local Authority
MVFE	Monetary Value of Fraud and Error
NBR	National Benefit Review
NPV	Net Programme Value
OE	Official Error
OP	Overpayment
PC	Pension Credit
PIP	Personal Independence Payment
PM	Performance Measurement team
PSU	Primary Sampling Unit
QA	Quality Assurance
SP	State Pension
UC	Universal Credit
UP	Underpayment

Appendix 2: Glossary of Statistical terms

The statistical terms used in this report are explained below.

95% Confidence

Interval: The range of values within which we can be 95% sure that the true value we are trying to estimate lies. It is used as a measure of the statistical uncertainty in an estimate.

Estimate: An estimate is an indication of the value of an unknown quantity based on observed data. It provides information about unknown values in the population that we are trying to measure.

Population: A population is any entire collection of items from which we may collect data. It is the entire group that we are interested in, which we wish to describe or to draw conclusions about (generally benefit claimants or expenditure in the context of this report). There are two different types of population referred to in sampling:

The Target Population - consists of the group of population units from whom **we would like to** collect data (e.g. all people claiming a benefit).

The Survey Population - consists of the group of population units from whom **we can** collect data (e.g. all claimants with sufficient case details on our datasets). The Survey Population is sometimes referred to as the 'Sampling Frame.'

Sample: A group selected (randomly in the context of this report) from a larger group (known as the 'population'). Through analysing the sample we aim to draw valid conclusions about the larger group

Appendix 3: Employment and Support Allowance, Jobseeker's Allowance and Pension Credit Assumptions

	Detail
Sampling	
Randomness	For each benefit, cases to be reviewed are randomly selected every month from a group of local authorities which we call Primary Sampling Units (PSU).
Representativeness	The stratified random sample is assumed to be representative of the population
Abandoned cases	<p>Of the cases sampled there are some that have to be explicitly excluded from the sample of cases that can be visited according to strictly defined criteria for abandonment. When such cases occur in the sample, they are replaced by another case, from a reserve list. However, for a small number of abandoned cases replacement is not possible for practical reasons.</p> <p>Abandoned cases are regularly analysed to ensure the abandonment rate remains at a steady state and also that certain abandonment codes do not significantly increase.</p> <p>A sample of abandoned cases is reviewed for Official Error only and these are used within the results.</p>
Adjustments	
Netting and Capping	See Netting and Capping detail
Net Programme Value (NPV)	See NPV detail
New Cases Factors	The durations of the sample cases compared to the benefit population is not aligned and is addressed by post-stratifying the sample of claimant outcomes by claim duration. Weights for each duration group according to its representation in the population are applied as part of the grossing calculation to achieve a more accurate estimate of fraud and error.
Estimated Outcomes	See Estimated Outcomes detail
Grossing	
	There are two different broad grossing factors (GF), one for official error and one for fraud and claimant error. The official error grossing factor is used on the sample which covers all cases where an official error check was done. The fraud/claimant error grossing factor is used on the sample which covers all cases where a full check was done – i.e. official error

	<p>check and claimant review. The data is presented to us as weekly amounts of benefit paid, overpaid or underpaid so we must multiply by 52 to get annual amounts.</p>
<p>Extrapolation</p>	
<p>Cases Outside the Scope of the Sample</p>	<p>Claim Processing delays (or systematic undercount) The administrative datasets from which the JSA, ESA and PC samples are drawn exclude some claims in their very early stages because it takes some time for them to be registered and processed on computer systems. The benefit reviews do not, and could not easily, then review the correctness of the expenditure that was paid retrospectively when the claims were awarded.</p> <p>It has been assumed that the rates of fraud and error on claims in their earliest stages that are missing from the data scans for JSA, ESA and PC, have the same rates of fraud and error as the shortest duration claims that are within the scope of the respective samples. This affects official error, claimant error and fraud.</p> <p>Claims in their first few months (or inflow of cases) In the JSA, ESA and PC samples, no claimants claiming for under eight weeks will be visited by Performance Measurement to carry out claimant error and fraud checking. This is due to the unavoidable delay associated with gathering case papers and conducting previews among other operational considerations, between sample selection and visiting work.</p> <p>It is assumed that these not sampled shortest duration cases have the same rate of fraud and claimant error as the youngest cases for which we are able carry out reviews.</p>
<p>Incomplete Sample Coverage</p>	<p>Incomplete fraud investigations Sampled cases may already be undergoing investigation for fraud or a suspicion may be raised at the interview or elsewhere during the review process. Fraud investigations, carried out by the Fraud Investigation Service (FIS), can be very lengthy. The investigation may not be completed at the time of the analysis so that final outcomes cannot be established on these cases.</p> <p>It is assumed that the rate of fraud and error on the outstanding cases is the same as among cases that have previously been subject to a FIS investigation and a conclusion has been reached. We calculate a proportion and an overpayment rate and multiply these together to obtain a weighting which is then applied to the estimates. This affects fraud and claimant error only.</p> <p>Incomplete official error checks A small percentage of cases remain outstanding after official error checking. This may be due to failure by the office or the claimant to</p>

provide, within specified timescales, case papers or verification required in order to be able to complete the check. Other cases may be outstanding for outcomes on their official error checks where they are undergoing fraud investigations or are being considered by the PM arbitration team.

It is assumed that the rate of official error on the outstanding cases is the same as among those cases that were previously incomplete but a conclusion has now been reached. We calculate a proportion and an overpayment rate and multiply these together to obtain a weighting which is then applied to the estimates. This affects official error only.

Abandoned cases

It is assumed that abandoned cases have the same rate of fraud and error as that across all of the other sample cases we are able to measure. The grossed award amounts for various abandonment categories (including claimant abroad, claimant in hospital, claimant/partner terminally ill and claimant bereaved) are summed together and divided by the total grossed award amount. We calculate a proportion and an overpayment rate and multiply these together to obtain a weighting which is then applied to the estimates. This affects fraud and claimant error only.

Appendix 4: Housing Benefit Assumptions

	Detail
Sampling	
Randomness	For each client group, cases to be reviewed are randomly selected every month from a group of local authorities which we call Primary Sampling Units (PSU).
Representativeness	The stratified random sample is assumed to be representative of the population, including the four HB client groups.
Abandoned cases	<p>Of the cases sampled there are some that have to be explicitly excluded from the sample of cases that can be visited according to strictly defined criteria for abandonment. When such cases occur in the sample, they are replaced by another case, from a reserve list. However, for a small number of abandoned cases replacement is not possible for practical reasons.</p> <p>Abandoned cases are regularly analysed to ensure the abandonment rate remains at a steady state and also that certain abandonment codes do not significantly increase.</p>
Adjustments	
Netting and Capping	See Netting and Capping detail
Estimated Outcomes	See Estimated Outcomes detail
New Cases Factors	The durations of the sample cases compared to the benefit population is not aligned and is addressed by post-stratifying the sample of claimant outcomes by claim duration. Weights for each duration group according to its representation in the population are applied as part of the grossing calculation to achieve a more accurate estimate of fraud and error.
Underlying Entitlement	<p>Housing Benefit can be paid to claimants of a social security benefit which “passports” them onto HB. Claimants not on another benefit can also receive HB to help with their rent if they have low earnings – these are called “standard” cases.</p> <p>The principle of Underlying Entitlement is to identify where, as a result of the Performance Measurement (PM) check, a claimant no longer has a “passported” entitlement to Housing Benefit but retains entitlement due to low earnings and/or high rent.</p> <p>In these cases a more accurate indication of the loss to public funds or underpayment to the claimant would be to offset the two benefit awards. This is used as a proxy for an actual difference in entitlements.</p>

	<p>For some cases the Review Officer is able to estimate the underlying entitlement but sometimes does not have all the information required in order to calculate or estimate its value. For these cases it is assumed, based on analysis of a comparable sample of cases where the underlying entitlement is known, that on average, customers would still be entitled to 70%-80% of the full HB award.</p>
<p>Loss of Claimant Contact</p>	<p>A case is classified as Loss of Claimant Contact (LoCC) when contact with the claimant is lost and they do not engage with the full review process. This can either be through not being available to complete the review or requesting that their claim to benefit is withdrawn.</p> <p>Some claimants may fail to engage due to fraudulent activity that they know will affect their entitlement to Housing Benefit. Other claimants may have different reasons for not engaging which do not affect their entitlement to HB.</p> <p>If contact with the claimant is lost during the review process then the claimants' benefit is terminated and a 'whole award' fraud error is recorded. The cases in the HB sample that have an LoCC error are checked after three months (an appropriate amount of time for the claimant to action the reinstatement of their benefit) to see whether the benefit has been reinstated. If the claimant has had their benefit reinstated at either the same entitlement or a higher entitlement, then the case is considered to be 'benefit correct', meaning that the previous categorisation is incorrect. The monetary values for LoCC errors on HB are adjusted to account for this.</p> <p>Due to the publication schedule of the fraud and error statistics, it is not possible to check the cases that were reviewed during the latest six months of the sampling period that feeds into the published statistics. Since the adjustment is not based on all cases in the current sample, a rolling average is used, including data from April 2015 onwards; this is updated as each new six months' worth of cases are checked. It is assumed that the level of benefit reinstatement in the sample is representative of the population.</p>
<p>Arrears Advance</p>	<p>Housing Benefit is paid periodically, either in arrears or advance (most often four weeks in arrears). The review process aims to assess and record whether the circumstances of a customer on the day they are reviewed are exactly the same as those upon which the HB assessment for that case on that day is based. However, the HB payment that is made for the review date will generally be made on a different day.</p> <p>This gives rise to two effects:</p> <ol style="list-style-type: none"> 1) Arrears: If HB is paid in arrears, then the case is reviewed before the date of payment. If the case is found to be incorrect, it is possible that

	<p>the error would be corrected between the interview and the payment, so that the HB is actually paid correctly, but is recorded by the review as incorrect. We therefore make a downward adjustment to the estimates to account for the resulting overstatement of error.</p> <p>2) Advance: If HB is paid in advance, then the case is reviewed after the payment has already been made. If the payment was made incorrectly, but the error was then corrected between that date and the review, then the case will be recorded as correct, even though the actual payment was wrong. We therefore make an upward adjustment to the estimates to account for the resulting understatement of error.</p> <p>The methodology developed to make these adjustments involves modelling the rates at which errors would be corrected, using data recorded on the duration of identified overpayments for different groups of cases, and applying this to the information on the payment dates and periodicities of the sample cases</p>
Grossing	
	<p>It is assumed that grossed values are representative of the majority of the population – this does not include any cases outside of the scope of the original sample (mainly the systematic undercount due to new cases), which are accounted for through extrapolation.</p>
Extrapolation	
	<p>Extrapolations have been made to provide estimates for the levels of fraud and error for the whole of the HB expenditure. The method of extrapolation is based on the assumption that 12% of expenditure not covered by the HB review is accounted for by new claims.</p>

Appendix 5: Universal Credit Assumptions

	Detail
Sampling	
Randomness	<p>A sampling frame is derived each month from Live and Full Service cases on departmental IT systems.</p> <p>A random sample of cases is drawn for a particular assessment period, where the assessment period is the month prior to the last payment (or the date payment was due if no payment is made).</p> <p>Universal Credit (UC) sample cases are not selected by geographical areas as the reviews are completed via telephone. Cases for review are randomly selected nationally each month. This means that we would expect the cases in the sample to be broadly similar to the cases on the departmental IT systems.</p>
Representativeness	<p>UC Live Service is the system that has been used to administer the majority of UC claims to date, which were largely single unemployed jobseekers. A new system is being rolled out, referred to as Full Service, which will be open to all UC claimant types and will result in the 6 legacy benefits closing to new claims.</p> <p>The sample is drawn from both Live and Full Service systems, which means that the sample represents both elements of the caseload. Measurement to estimate fraud and error for Full Service claimants started in October 2017 and the first 6 months of data was included in the fraud and error estimates in the 2017/18 final published statistics.</p> <p>It is forecast that across the whole of 2017/18, on average 55% of the UC caseload was administered through the Live Service system and 45% via the Full Service system. It is assumed that the 6 month sample of Full service cases will be representative of the 45% of the caseload administered through the Full Service system for the whole of 2017/18.</p>
Abandoned cases	<p>Of the cases sampled there are some that have to be explicitly excluded from the sample of cases that can be reviewed according to strictly defined criteria for abandonment. When such cases occur in the sample, they are replaced by another case, from a reserve list of randomly selected cases. However, for a small number of abandoned cases replacement is not possible for practical reasons.</p> <p>Abandoned cases are regularly analysed to ensure the abandonment rate remains at a steady state and also that certain abandonment reasons are not increasing.</p>

Adjustments	
New Cases Factor	An adjustment for new cases is not made for UC. Further analysis is required to explore a possible adjustment once more review data becomes available.
Netting and Capping	The UC assessment period is the month prior to the last payment (or the date payment was due if no payment is made). This period is used to assess Claimant Fraud (CF), Claimant Error (CE) and Official Error (OE). Since this period is the same for all checks completed, netting and capping on individual claims is completed across all error types for over and underpayments. A hierarchy order of Fraud, Claimant Error then Official Error is used to produce a net over or under payment at case level.
Net Programme Value (NPV)	See NPV detail
Estimated Outcomes	See Estimated Outcomes detail
Cannot Review Cases	<p>Cases that cannot be reviewed, primarily due to the claimant not engaging in the review process resulting in their benefit claim being suspended and later terminated, are initially recorded as fraud.</p> <p>Not all of these cases will be fraud so additional checks are conducted at a later date to determine if the individuals have reclaimed benefit or a suspicion of fraud recorded on the case at the initial preview. The outcome of this checks will result in the case being re-categorised for reporting. 4% of sampled cases in 2017/18 did not have an effective review.</p> <p>There are three different categories that are applied to cannot review cases for reporting purposes:</p> <ul style="list-style-type: none"> • Not Fraud - If the individual reclaims benefit within 4 months, with the same circumstances and at a similar rate they were receiving prior to review, then the fraud is removed. • Fraud remains - If an individual does not reclaim benefit and there was a suspicion of fraud raised at the preview stage of the review then the case remains as fraud. • Inconclusive – If the individual does not reclaim benefit and there was no suspicion of fraud at the preview stage of the review then the case is categorised as inconclusive as there is no evidence to suggest the case is fraud or not. <p>Inconclusive cases are excluded from the estimates and reported separately in footnotes in the publication and supporting tables.</p>

Grossing	
	UC caseload and expenditure is on a significant upward trend, with new case types being introduced as rollout continues. As a result grossing for UC is calculated on a monthly basis. This ensures that an error identified at the start of the year (representing a smaller caseload) is grossed up by less than an error identified at the end of the year (representing a larger caseload).
Extrapolation	
Abandoned Cases	Fraud and Claimant Error are not measured on these cases and it is assumed these will have the same rates of fraud and error as observed for reviewed cases.
Expenditure	The UC sample is drawn from both Live and Full Service UC cases. Expenditure is split between each service and Fraud and error estimates are extrapolated separately prior to being combined to provide overall results. As only 6 months of Full service data is available the results are extrapolated to 12 months (2017/18) expenditure for Full service.

Appendix 6: Personal Independence Payment Assumptions

	Detail
Sampling	
Randomness	<p>A sampling frame is derived each month from live in payment cases on departmental computer systems, to identify live PIP cases in payment. The following cases are excluded from the sampling frame:</p> <ul style="list-style-type: none"> • Claimants who are deemed Special Rules, Terminally ill (SRTi); • Cases with a new or reviewed award within 3 months; • Cases which have a planned intervention, appeal or reconsideration due in the 6 weeks following the sample date. <p>A stratified random sample, based on geographical areas, is drawn each month. Exceptions to this are some hard to reach geographical areas.</p> <p>We would expect the cases in the sample to be broadly similar to the cases live on the IT system, with the exception of the excluded cases.</p>
Representativeness	<p>The sample is taken from around 79% of the caseload. These are checked for Fraud, Claimant Error and Official Error.</p> <p>The remaining 21% of the caseload is not sampled. These are cases that are either not in payment, outside the geographical area, Special Rules Terminally Ill (SRTi) cases, had a new claim, award or intervention within 3 months, have a forthcoming review, or have an ongoing intervention. The largest of these at 8% being those with an ongoing intervention i.e. a reconsideration, review or appeal.</p> <p>New cases and cases reaching their review point are under-represented in the sample. Analysis is planned to explore adjustments once more PIP review data becomes available.</p>
Abandoned cases	<p>Of the cases sampled there are some that have to be explicitly excluded from the sample of cases that can be visited according to strictly defined criteria for abandonment. When such cases occur in the sample, they are replaced by another case in the same PSU, from a reserve list of randomly selected cases. However, for a small number of abandoned cases replacement is not possible for practical reasons.</p> <p>Abandoned cases are regularly analysed to ensure the abandonment rate remains at a steady state and also that certain abandonment reasons are not increasing. A sample of abandoned cases is reviewed for Official Error only and these are used within the results.</p>

Adjustments	
New Cases Factor	A new cases factor adjustment is not made for PIP. New cases i.e. with an award or reviewed award of less than 3 months are around 4% of the population. Further analysis is required to explore a possible adjustment once more review data becomes available.
Netting and Capping	The PIP review week is used as the date for all Fraud, Claimant Error and Official Error checks. Since this period is the same for all checks completed, netting and capping on individual claims is completed across all error types for over and underpayments.
Estimated Outcomes	Estimated outcomes are not made for PIP due to the operational case managers making the final award decision, which often cannot be made without evidence from the Medical Assessment. The volume of outstanding cases within PIP is very small. This is monitored and if necessary an adjustment would be incorporated.
Reasonably Expected to Know (Overpayments)	<p>For disability benefits there are some changes which the claimant should report, for example hospitalisation. However many changes are gradual improvements or deteriorations in their medical needs and it is difficult for some claimants to know at what point these needs have changed sufficiently to affect their benefit entitlement.</p> <p>PIP legislation states that when a case is reassessed and their benefit is reduced the Department will only seek to recover an overpayment when it is reasonable for the claimant to have known they should have reported the change. In other cases the benefit will be treated as correct up to the point of reassessment.</p> <p>It was identified that during PIP reviews there appeared to be variance in the application of “Reasonably expected to know” decisions, resulting in such cases not always having overpayments reported.</p> <p>In Spring 2017, PM staff completed a joint exercise with PIP Operational staff to reconsider all of the information available to identify improvements to the review process to ensure the measurement of PIP was sufficiently robust.</p> <p>Accordingly, error cases have been excluded from the headline overpayment estimates where the claimant <u>could not</u> reasonably have been expected to know they should have reported it.</p>
Reasonably Expected to Know (Underpayments)	This exclusion has not been applied to underpayment claimant errors, since these are not subject to the “reasonably expected to know” legislation and follow different rules in the regulations.

Grossing	
	PIP caseload and expenditure is on an upward trend as rollout and migration onto PIP continues. The grossing for PIP is calculated on a six-monthly basis, to ensure that that an error identified at the start of the year (representing a smaller caseload) is grossed up by less than an error identified at the end of the year (representing a larger caseload).
Extrapolation	
Abandoned Cases	Fraud and Claimant Error are not measured on these cases and it is assumed these will have the same fraud and error rates as observed for full review cases.
Special Rules Terminal Illness (SRTi)	<p>SRTi cases are approximately 2% of the caseload and are excluded from the sample. Data shows that 99.7% are receiving the highest award.</p> <ul style="list-style-type: none"> • It has been assumed there will be no Underpayment errors, since the majority of cases can't get awarded a higher award even if their needs had deteriorated. • Given the strict criteria for SRTi (medical report by GP, consultant, Macmillan Nurse; they have to have a progressive disease and not be expected to live for more than 6 months). It has been assumed there will be no Claimant Error and Fraud overpayments. • Official Error Overpayments – are assumed to have the same rate as observed for full review cases.
Expenditure	The PIP full review sample represents 79% of the caseload. 2% SRTi cases are taken into account as above. The remaining 19% is not measured or adjusted for; hence it is assumed the remaining caseload and corresponding expenditure will have the same Fraud and Claimant Error rates as observed in the full review sample.