



**Social Security
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Tèarainteachd Shòisealta Alba



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Research Report

Official Error in Scottish Child Payment: Pilot Review

March - May 2023

Dignity,
fairness,
respect.

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Executive Summary

Monetary Value of Fraud and Error is the percentage of expenditure associated with the estimates of fraud and error. Estimating levels of undetected fraud and error in our benefit caseloads helps us ensure management of public funding is correct and fair through understanding the extent of irregular payments.

For Scottish Child Payment (SCP), Official Error underpayments were estimated in 0.2% of the eligible population of cases over March, April, and May 2023. The estimated monetary value associated with this result at population level is £140,000 (0.1% of expenditure). For SCP, Official Error overpayments were estimated in 0.8% of the eligible population of cases between March and May 2023, with an estimated monetary value of £1,120,000 (1.1% of expenditure).

A pilot desk review of SCP was conducted on 400 SCP cases in payment selected using simple random sampling. Cases were selected through a fully reproducible random process.

Cases were reviewed for overpayments and underpayments caused by Official Error within a reference week in each month for which they were sampled.

A representative sample was used, however, the small number of errors identified suggests that estimates are only indicative and should not be considered a precise measure of Official Error in SCP.

Lessons learned from this pilot exercise will inform future Social Security Scotland Monetary Value of Fraud and Error reviews.

Introduction

Undetected fraud and error can lead to the Scottish benefit system paying clients more than their entitlement, which constitutes overpayment, or less, which constitutes underpayment.

To ensure fair delivery of services to clients and appropriate use of public funds, it is important to understand the prevalence¹ and cost of underpayments and overpayments. This helps us ensure management of public funding is correct and fair. The estimated cost of incorrect payments to clients is referred to as *Monetary Value of Fraud and Error (MVFE)*.

It is important to understand the reason for incorrect payment in order to inform future practices within the benefit system. An incorrect payment can result from:

- Official Error: errors made by Social Security Scotland. Official Error can be broken down into three sub-categories: Human error; System error; and Other Government Department error.
- Client Induced Error: Errors made by clients, through provision of incorrect or incomplete information; or through failure to report a change in circumstances. These are genuine mistakes.
- Fraud: Where evidence suggests that provision of incorrect or incomplete information, or failure to report a change of circumstances, was done with the intention of obtaining benefit by deceit.

The current report presents the methodology and findings of a pilot review of a randomly selected sample of Scottish Child Payment (SCP) cases. For the pilot, we focused the scope of this review on Official Error only. Further work is being done to consider the requirements to widen the scope of future surveys using this methodology. This pilot project estimated the Prevalence and Monetary Value of Official Error in SCP through a desk review process. Errors which resulted from procedures not being followed were identified during this pilot, but if they did not result in an over or underpayment, they were classed as procedural errors and excluded from counts of official error.

Lessons learned from this pilot exercise will inform future Social Security Scotland Monetary Value of Fraud and Error reviews.

¹ The proportion of cases with Fraud and/or Error

Scottish Child Payment Benefit

SCP was initially introduced for low-income families with children aged under six years and was extended to eligible low-income families with children aged under 16 years on 14 November 2022. It is intended to provide regular, additional financial support for families already in receipt of qualifying benefits to assist with the costs of caring for a child.

There are no limits on the number of eligible children for whom an SCP application can be made and since 14 November 2022 eligible families receive £25 per child, per week. SCP is administered by Social Security Scotland through an application-based process and is paid on a four-weekly basis.

On 14 November 2022 a new feature titled 'Straight-through Processing' was introduced to allow applications which meet a specific set of criteria to be automatically passed to the payment approval stage.

Further detail on the SCP benefit, including eligibility requirements and the application process, can be found in the SCP statistical publication in the Background to Scottish Child Payment section (see [Scottish Child Payment: High level statistics to 30 June 2023, Social Security Scotland](#)).

Methods

Sampling

For the purposes of this pilot review, a sample was randomly selected from an eligible population of cases in payment (i.e. cases). Eligible cases had to be active during a specified reference week in March, April, or May 2023. These cases make up the eligible population from which the sample is drawn. The eligible population of cases is therefore included in but distinct from the total caseload in SCP official statistics publications, as shown in Figure 1. Once a case was selected for review in one reference week, it could not be selected for another reference week.

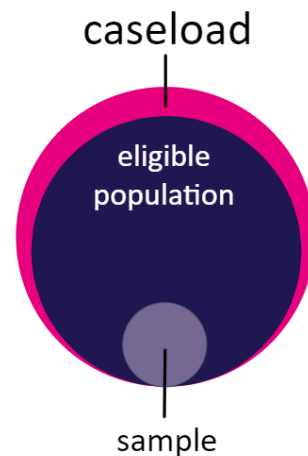


Figure 1: The relationship between sample, eligible population, and caseload

The required size of the sample was calculated using the known eligible population size across the three months (March to May 2023) and parameters defined according to standard practice (see Annex A for more detail).

A sample was drawn using the following procedure, illustrated in Figure 2 below.

- A sample size with known population was calculated.
- The probability of selection was calculated and assigned equally to all cases.

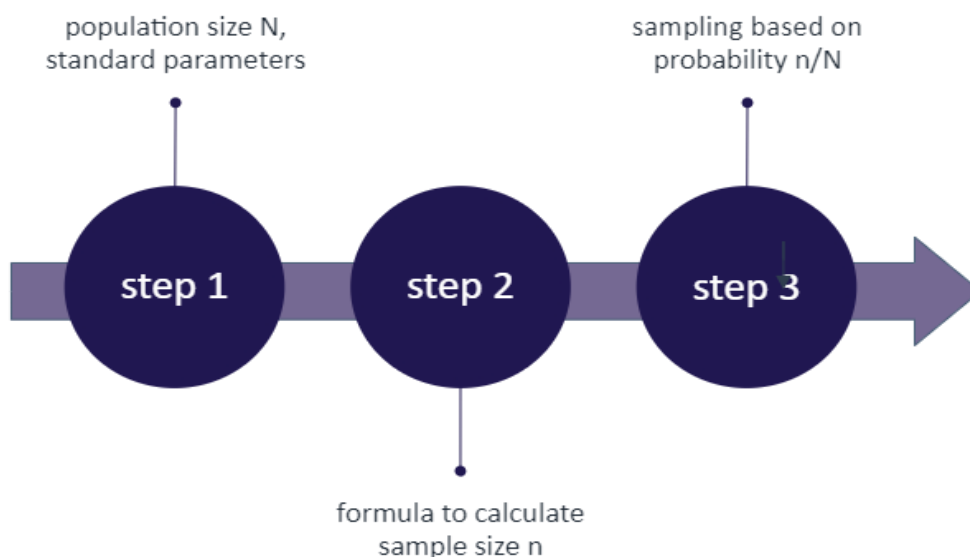


Figure 2: Current methodology of obtaining a sample.

A random number generator was then used to randomly determine whether a case would be included in the sample. This random generator was also used to assign cases to the backup sample.

Using the procedure described above across the three reference weeks, a sample of 400 cases with an additional backup random sample was drawn from the eligible case population. This means that every case in the eligible population had an equal chance of being selected for review. Once produced, the sample was quality assured, including checking it was representative of the eligible population of cases. For this purpose, we compared the distribution of amount paid and the start date of each case compared to the eligible population. The distributions were closely aligned, suggesting the sample was representative. Around 25% of the sample for this pilot exercise was made up of Straight-Through Processing cases.

The entire sampling process was conducted through a complete Reproducible Analytical Pipeline (RAP) to minimise error and analyst involvement in selecting cases, as it ran with no human input after specifying the eligible population size and associated parameters. This process was random but reproducible using a specified seed, meaning running the code with the same data and seed yielded the same random result. The RAP code and any adjustments specific to loading the SCP data were quality assured and peer-reviewed by other professional statisticians in Social Security Scotland. This RAP will be used again in future surveys.

Data

The data used to create the eligible population for the random sample selection was sourced from Social Security Scotland's case management system. This system holds the application, decisions and payments related to the applicant, their partner and their children. The data is entered by the client during an online application or is entered by client advisors during telephone applications or processing of paper applications.

Data cuts combine information from the different tables in the system into one daily extract which includes details of all SCP applications made since 9 November 2020. A daily case extract is used to determine cases which are currently in payment and therefore 'live'. A 'payments extract' which contains information on the financial aspects of applications for SCP, is used for the monetary value estimates. In the data used for this review, each case is broadly equivalent to a payee.

Monthly expenditure, used to estimate overpayment and underpayment values, uses published data from the SCP statistical publication (see Table 6, Payments by month). This is a different methodology to that used in Social Security Scotland financial account reporting. As a result, there may be differences in the values reported for a given time period.

Table 1: SCP Payments by month

Payment Month	Total value of payments
March 2023	£36,048,565
April 2023	£36,754,160
May 2023	£33,598,090

Source: [Scottish Child Payment: High level statistics to 30 June 2023, Social Security Scotland](#).

Review of cases

To establish if Official Error occurred within a case, a team of reviewers independently checked and confirmed correct processes to both award benefit and to apply changes during the life of a case.

To facilitate this process, a desk aide was created to allow the team to check and compare several components of a case. An initial preview of each case established suitability for review. Following this, using the desk aide as a prompt, a series of checks were carried out to ascertain that a case met the eligibility and entitlement criteria at the time of the application being made. Once entitlement at the new claim stage was established, the review moved on to changes in circumstances. Again, a series of checks were carried out and using the desk aide as a prompt, the review established if any changes were found and if these had been applied correctly to a claim. All information found during the review was collated on the desk aide and thereafter, the review team used this, with reference to relevant guidance and processes, to establish if the benefit had been correctly awarded or error was found.

The review team worked in partnership with colleagues in error resolution teams to ensure that all cases where error was detected have been corrected and the relevant over or under payment action has been completed. Where cases could not be confirmed correct or incorrect by desk review alone, further information was collected and the outcome was confirmed based on the additional evidence.

On completion of the desk-based review, the outcome for each case was recorded on a secure spreadsheet. This was then used by Social Security Scotland statisticians to conduct analysis.

Analysis

The data collected went through checks and cleaning. The data then underwent netting and capping, mirroring methodology used by Department for Work and Pensions (DWP) (see [Background information: Fraud and error in the benefit system statistics, 2022 to 2023 estimates - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/background-information-fraud-and-error-in-the-benefit-system-statistics-2022-to-2023-estimates) for more detail) For more detail on comparing the methodologies, please see Annex B.

During the netting and capping process, where a case has an error leading to an overpayment and an underpayment, a ‘netted’ value will be produced to provide a single overpayment or underpayment outcome and amount. When a case has more than one error, the total monetary value associated with it is calculated by “netting off” the errors, for example deducting the cost of an underpayment error from the cost of an overpayment. Capping applies a prioritisation process where more than one error is found.

We then scaled up counts of errors and their associated monetary value in the sample to the population level in a process called grossing (see Annex A for more detail).

To estimate the prevalence of Official Error, we divided the grossed counts by the total eligible population size, which was calculated during sampling. This proportion was then converted to a percentage.

To calculate the estimated Monetary Value of Official Error (MVOE) and what proportion of the expenditure it reflects, we aligned the monetary amount in the sample with the overall benefit expenditure. This, combined with grossing, was then used to obtain the total estimated amount of MVOE. This monetary amount was converted to a percentage of the total expenditure to represent the rate of MVOE.

It should be noted that while the sample was representative of the caseload, the small number of official errors found were not adequate for robust bootstrap confidence intervals. This means that the outputs are indicative only and cannot be considered a precise measure of Official Error in SCP. This will be addressed in future reviews (for more detail, see recommendation 3 in Lessons Learned).

Tables and Commentary

The tables below outline the estimates of error. Table 2 presents the proportion of errors in the caseload (error frequency rate). Table 3 presents the monetary value in £s or as a proportion of the total expenditure.

Official Error overpayments were found in an estimated 0.8% of the SCP caseload. There were around £1,120,000 of incorrect overpayments made in March – May 2023, which is 1.1% of the total expenditure for these three months.²

Official Error underpayments were found in an estimated 0.2% of the SCP caseload. There were around £140,000 of incorrect underpayments made in March – May 2023, which is 0.1% of the total expenditure for these three months.²

Table 2: Pilot estimates of percentage cases paid the incorrect amount in Scottish Child Payment, by overpayment and underpayment, Mar – May 2023^{1,2,3,4}

Error Type	Percentage of caseload
Official Error Overpayment	0.8%
Official Error Underpayment	0.2%

Source: Social Security Scotland, 2023

Table 3: Pilot estimates of amount and percentage of expenditure in Scottish Child Payment, by overpayment and underpayment, Mar – May 2023^{1,2,3,4}

Error Type	Monetary Value	Percentage of expenditure
Official Error Overpayment	£1,120,000	1.1%
Official Error Underpayment	£140,000	0.1%

Source: Social Security Scotland, 2023

Table Notes

1. Estimates are for active cases in March 2023 – May 2023
2. This data is subject to low reliability and may be less precise as a result. It should be used as an indicative estimate only and not a precise measure of prevalence or monetary value.
3. Estimates are rounded to the nearest £10,000 and 1 decimal place.
4. Estimates do not follow DWP methodology in full and, as such, should not be used in direct comparison.

² Note that this data is subject to low reliability and may be less precise as a result. It should be used as an indicative estimate only and not a precise measure of prevalence or monetary value.

Lessons Learned

Sample Sizes

The pilot used standard sampling parameters (95% confidence levels, 5% margin of error) to calculate a large enough sample based on the eligible population size. However, the small number of errors found meant the estimates were subject to low reliability and were inadequate for calculating reliable bootstrapping confidence intervals.

To mitigate this issue in future, we recommend that the sample be larger. A greater sample size is expected to reduce potential variability and ensure that the population-level estimates are robust. Resource is already in place to accommodate significantly larger sample sizes for future reviews.

Recommendation 1: Consider the statistical implications of using different sample sizes, in order to make an informed decision about the sample size used in the next review.

Random Sampling

The random sampling approach and its implementation was designed to be fair and robust. This approach was chosen to ensure that human bias was excluded from the process of selecting cases. A consequence of assigning to the sample based on this method was that the sample size for each month was slightly different. This was addressed through weighting the error counts during grossing.

Recommendation 2: Adjust the random sampling workflow to produce a sample of an exact pre-defined size. Additionally, the total sample will be divided in equal monthly samples. See Figure 3 below.

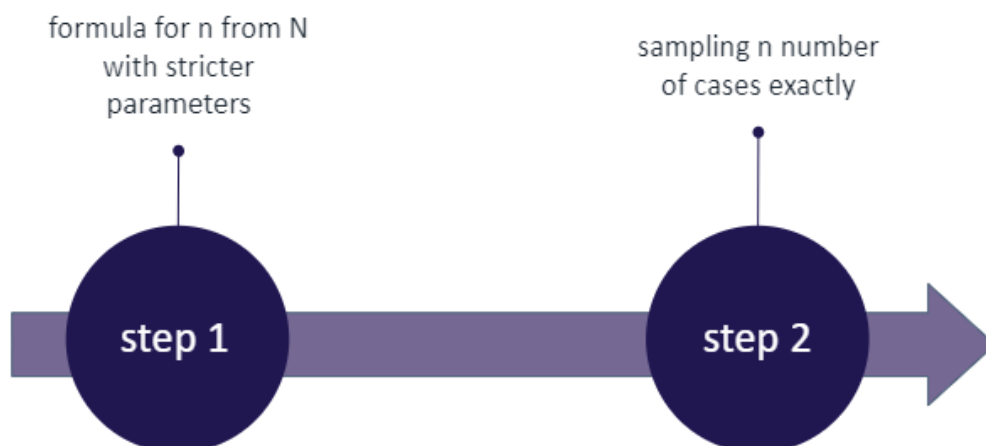


Figure 3: Provisional new methodology of obtaining a random sample

Bootstrapped Confidence Intervals

Given that the prevalence of error is not expected to be normally distributed, standard parametric confidence intervals are not appropriate to use. Instead, we intend to use resampling and percentile bootstrap, which are non-parametric. These are tools to improve robustness of our estimates and identify where they would be expected to range at the population level.

Reproducible analytical code, including the bootstrap confidence interval calculation, was developed for this pilot exercise, but the small number of errors we observed was not adequate for bootstrapping. This is because resamples and bootstrap confidence intervals directly reflect the quality and magnitude of the input data.

Recommendation 3: Estimate bootstrap confidence intervals.

Reproducibility of Sampling and Analysis

In order to produce a fair and robust method of selecting cases, statisticians developed a Reproducible Analytical Pipeline (RAP). A complete RAP was used to draw the sample for this review. The analysis code was produced reproducibly with the aim of further development into a complete RAP.

Recommendation 4: Further develop RAP code for analysis.

System Requirements

The project requires the collaboration of the statistics and review teams from planning to executing the survey, requiring restricted storage and sharing systems.

Recommendation 5: Continue to use and develop systems for storage, management and sharing of collected data between teams.

Exploring the definition of eligible populations

The sample was drawn from the eligible population of cases using pre-determined exclusion criteria. However, it is unclear what the impact of these exclusions is on the Official Error estimates.

Recommendation 6: Explore the impact of the inclusion criteria for the eligible population of cases. Consider the relevance and importance of these exploratory findings for future surveys.

Annexes

Annex A: Formula for sample size calculation and grossing

Our formula calculates the sample size as in the standard method, with the additional percentage of cases for the backup sample. The notation n refers to the sample size and N refers to the population size.

$$n = \text{int}\left(b_p \frac{N X}{X+N-1}\right)$$

with

$$X = \frac{z^2 p(1-p)}{e^2}$$

Where:

p reflects the sample proportion, which states what the success proportion is expected to be. This is a proportion of cases that possess the characteristic being studied. We set this to the maximum 0.5.

e reflects the margin of error, typically set at 5%. At the standard level, it gives us 95% confidence level, without being too conservative.

z is a theoretical measure typically set at 1.96 as it is calculated based on standard significance cut-off $\alpha = .05$ and 95% confidence level.

b_p is a factor that takes user-defined percentage **perc**, for example 15 for 15% backup sample, and divides it by a 100, before then adding 1. For a 15% backup sample size:

$$b_p = \frac{\text{perc}}{100} + 1 = \frac{15}{100} + 1 = 1.15$$

The function **int** obtains the integer of the calculation.

Each error and its associated monetary value is multiplied by the Grossing Factor and is scaled up to represent a proportion of cases in the population. The Grossing Factor (GF) is calculated by dividing the entire eligible population in the sampling frame (N) by the number of cases in the sample (n)

$$GF = \frac{N}{n}$$

Annex B: Department for Work and Pensions (DWP) context and comparison

DWP regularly publish estimates of the monetary value of fraud and error in their benefit caseload. Social Security Scotland has closely followed their methodology where relevant and feasible.

Due to the methodological differences the rate of Official Error presented in this report cannot be directly compared with DWP estimates.

While there is no DWP benefit which is directly comparable with SCP, DWP rates for individual benefits indicate that it is perhaps normal for rates of Official Error to begin at higher values then fall over time as systems and processes are continuously improved.

In DWP surveys, Official Error is identified alongside Fraud and Client Induced Error. This means that for DWP's estimates, Official Error may be under-reported. The pilot data collection for this report has considered Official Error only and therefore should not be compared directly with DWP's Official Error estimates.

DWP also report de minimis results, which exclude errors that are 10p or less. However, there were no errors of 10p or less in this sample, meaning that applying this methodology would not have affected the pilot estimates.

In addition, the pilot sampled three months of cases only, whereas DWP estimates cover a longer period.

Annex C: Concepts and Definitions

Term	Definition
Prevalence of Fraud and Error	The number of cases with Fraud and Error in a sample when grossed to be extrapolated to the population level and presented as a percentage.
Monetary Value	Monetary Value is the amount of expenditure associated with estimates of error identified in survey samples.
Reference week	The week for which sampled cases are reviewed for error. Errors outside the reference week are not counted in the results for this survey.
Case	For this review, a case is a recurring SCP payment associated with one or more applications.
Eligible population	The set of cases meeting eligibility criteria for review, such as being active and in payment during the reference weeks of the review. They are included in the caseload for a benefit, but only make up part of it.
Caseload	The total set of cases for a benefit as reported in Social Security Scotland Official Statistics publications

Related Social Security Scotland Publications

Future research and statistics publications will be available through the Social Security Scotland 'publications' webpage at:

<https://www.socialsecurity.gov.scot/publications>.

Statistics on Scottish Child Payment are published by Social Security Scotland at: <https://www.gov.scot/collections/social-security-scotland-stats-publications/#scottishchildpaymentstatistics>

Statistics on Scottish Child Payment feedback (complaints, compliments and suggestions) are due to be published in the next release of the Social Security Scotland feedback statistics published at: <https://www.gov.scot/collections/social-security-scotland-stats-publications/#socialsecurityscotlandfeedbackstatistics>.

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