UK Statistics Authority

Assessment of compliance with the Code of Practice for Official Statistics

Statistics on household incomes within small areas in England and Wales

(produced by the Office for National Statistics)

Assessment Report 324

May 2016

About the UK Statistics Authority
The UK Statistics Authority is an independent body operating at arm's length from government as a non-ministerial department, directly accountable to Parliament. It was established on 1 April 2008 by the *Statistics and Registration Service Act 2007*.

The Authority's overall objective is to promote and safeguard the production and publication of official statistics that serve the public good. It is also required to promote and safeguard the quality and comprehensiveness of official statistics, and good practice in relation to official statistics.

The Authority has two main functions:
1. oversight of the Office for National Statistics (ONS) – the executive office of the Authority;
2. independent scrutiny (monitoring and assessment) of all official statistics produced in the UK.

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NATIONAL STATISTICS STATUS

National Statistics status means that official statistics meet the highest standards of trustworthiness, quality and public value.

All official statistics should comply with all aspects of the *Code of Practice for Official Statistics.* They are awarded National Statistics status following an assessment by the Authority's regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

It is a producer's responsibility to maintain compliance with the standards expected of National Statistics, and to improve its statistics on a continuous basis. If a producer becomes concerned about whether its statistics are still meeting the appropriate standards, it should discuss its concerns with the Authority promptly. National Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.

Contents

1 Summary of findings

Introduction

1.1 This is one of a series of reports[1] prepared under the provisions of the *Statistics and Registration Service Act 2007*[2]. The Act gives the UK Statistics Authority power to re-assess whether the *Code of Practice for Official Statistics*[3] continues to be complied with in relation to official statistics already designated as National Statistics. The report covers the set of statistics reported in *Small Area Model-Based Income Estimates*[4], produced by the Office for National Statistics (ONS).

1.2 The previous assessment of this set of statistics was reported in Assessment report 160[5], published in December 2011. The Assessment team identified areas where it felt that ONS could strengthen its compliance with the *Code*, which ONS addressed during the course of the assessment. The Authority confirmed the National Statistics designation of these statistics in a letter to ONS on 20 January 2012[6]. The estimates have been re-assessed due to their occasional (ad hoc) release; they were originally assessed retrospectively after the previous publication of the statistics. There was also particular interest in gaining the views of users during the course of the development and after the release of the new (2011 Census-based) estimates.

1.3 This report was prepared by the Authority's Assessment team, and approved by the Regulation Committee on behalf of the Board of the UK Statistics Authority, based on the advice of the Director General for Regulation.

Decision concerning designation as National Statistics

1.4 In coming to its decision, the Authority notes that there is a clear demand for income estimates, which are not fully met by the ONS statistics due to a number of reasons, including the level of geography, the type of average produced, and the frequency and timeliness of release. ONS is undertaking useful work in researching a new method to produce median estimates of income for small areas. It has also told us that there is scope to produce further mean estimates, using the current method, that would be more timely than the 2011/12 estimates reviewed in this Assessment. So while the Authority judges that the statistics covered by this report are readily accessible, produced according to sound methods and managed impartially and objectively in the public interest, we consider that ONS needs to go much further to really add public value from the statistics. The Requirements in this report point towards that need to enhance the value of these statistics. ONS should take appropriate actions to meet the Requirements listed in paragraph 1.10 and report them to the Authority by July 2016. Once the Authority has agreed that appropriate

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[1] https://www.statisticsauthority.gov.uk/publications-list/?keyword=&type=assessment-report
[2] http://www.opsi.gov.uk/Acts/acts2007/pdf/ukpga_20070018_en.pdf
[3] https://www.statisticsauthority.gov.uk/monitoring-and-assessment/code-of-practice/
[4] http://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/smallareamodelbasedincomeestimates/2015-10-20
[5] https://www.statisticsauthority.gov.uk/publication/small-area-income-estimates-for-england-and-wales/
[6] https://www.statisticsauthority.gov.uk/publication/small-area-income-estimates-for-england-and-wales-letter-of-confirmation-as-national-statistics/

actions have been taken by ONS, it will confirm that the statistics published in *Small area model-based income estimates* are designated as National Statistics.

Summary of strengths and weaknesses

1.5   ONS has developed income statistics by combining the strengths of survey data with the small area detail of administrative and census data. The modelling of small area income estimates is an early example of the type of developments that the Authority would like to encourage. ONS is building on these experiences as it works towards the greater use of administrative data with the Census.

1.6   ONS produced clear guidance material in the statistical bulletin and supporting documentation to support the use of the income estimates. We heard from a range of users and potential users with a strong interest in income estimates. However, some local government and commercial users said that the statistics do not meet their needs due to: the measurement of mean rather than median estimates; the geographic level being too large to support the creation of bespoke geographies; and untimely statistics.

1.7   ONS has undertaken a range of engagement activities, including: contacting users through online fora – the Knowledge Hub and StatsUserNet; speaking at conferences; and formal user consultations. However, it has not made clear the nature of its development activities or how it is seeking to address the wider user needs identified through its user engagement.

1.8   The development and production of the estimates was shared across teams in ONS, with no clear leadership responsibility assigned. ONS delayed the production of the estimates to prioritise other work, reducing the value of the statistics.

Detailed recommendations

1.9   The Assessment team identified some areas where it felt that ONS should improve the production and presentation of statistics in *Small area model-based income estimates*. Those which are essential for ONS to address in order to strengthen its compliance with the *Code* and to enable designation as National Statistics are listed – as Requirements – in paragraph 1.10, alongside a short summary of the key findings that led to each Requirement being made. Other recommended changes, which the Assessment team considers would improve the statistics and the service provided to users but which are not formally required for their designation as National Statistics, are listed as Suggestions in support of the associated Requirement.

Requirements for designation as National Statistics

1.10   This paragraph includes those improvements that ONS is required to make in respect of its *Small area model-based income estimates* in order to fully comply with the *Code of Practice for Official Statistics*, and to enable designation as National Statistics.

Finding	Requirement	
ONS has undertaken a number of engagement activities. However, it lacks a coherent engagement plan and does not make its development activities clear to users. ONS should:	**1**	a) Develop and publish an integrated engagement strategy, drawing together the variety of activities with users across the relevant statistical teams in ONS into a coherent plan b) Publish its development plans for the small area estimation of income, including median income estimates and availability at lower super output area level, and provide regular updates to users about its progress (para 3.7)
No one business area in ONS is responsible for the production of *SAIE*, leading to a lack of prioritisation for the production of the estimates. ONS should:	**2**	a) Ensure that its statistical planning takes account of users' needs, particularly in relation to the timely publication of *SAIE*, and is transparent about priority setting, explaining the reasons for its choices b) Ensure that the resources allocated to the production of *SAIE* are sufficient to maximise the public value of the statistics (para 3.8)
A user identified implausible average income estimates in parts of London. ONS should:	**3**	Explore the concerns raised about the quality of the estimates for London areas, and publish the findings (para 3.12)
ONS does not provide sufficient explanation of the assurance arrangements of the administrative data used to produce *SAIE*. ONS should:	**4**	Outline the data assurance arrangements for the administrative data used to produce *SAIE*, making clear why it regards the data as sufficiently robust for this purpose. As part of meeting this requirement, ONS should consider the Authority's Report *Quality Assurance of Administrative Data* (para 3.15)
ONS does not make clear whether there are estimates for the other UK countries, nor explain the coherence with similar statistics such as the Indices of Deprivation. ONS should:	**5**	Provide information about the comparability and coherence of *SAIE* with other similar statistics and clarify the distinctive purpose that *SAIE* serve (para 3.16)

ONS published *SAIE* in a spreadsheet only, which is not machine-readable. It also does not provide the estimates through the Neighbourhood Statistics website. ONS should:	**6**	Publish *SAIE* in an open format that equates to at least a three-star level under the Five Star Scheme In meeting this Requirement, we suggest that ONS consider ways of encouraging the wider use of *SAIE* by making the statistics available through other means such as Nomis (para 3.18)

2   Subject of the assessment

Introduction

2.1   ONS produces *Small area model-based income estimates* (*SAIE*) to meet growing interest in income estimates at a local level, to support profiling of geographical areas and identification of disadvantaged communities, since the Census does not ask about income. Local government bodies use the estimates to support service planning and delivery, such as for adult social services. The estimates are used in central government for policy development and monitoring, particularly related to poverty; by researchers in health and socio-economic analyses; and members of the public to find out about local levels of income. They are of potential use to other users such as commercial organisations, but users from this sector told us that they require the data for smaller geographic levels. Some of these users pay commercial companies to generate the required small area estimates. They also would prefer median rather than mean income estimates. (See annex 2 for further information from users responding to the Assessment user survey.)

2.2   The geographical coverage is England and Wales. There is no national or international legal requirement to produce these statistics. Equivalent figures are not produced for Scotland or Northern Ireland. ONS says that such statistics could be calculated but would be specific to these countries, using their Census geographies and covariate information (from Census or administrative sources), and would not be directly comparable with figures for England and Wales.

2.3   ONS first published the mean household income estimates for small areas in 2003, presenting the statistics for income in 1998/99 at ward level. It produced the 2001/02 income estimates also at ward level. The geography classification was changed to middle-layer super output area[7] (MSOA) level for the income estimates produced thereafter (for 2004/05, 2007/08, and 2011/12) in line with changes to the ONS geography policy.

2.4   ONS produces four measures of mean weekly household income:

- Total weekly household income:
    - the sum of the gross income of every member of the household plus any income from benefits such as Working Families Tax Credit
- Net weekly household income:
    - the sum of the net income of every member of the household. It is useful when assessing the average levels of income, having taken into account common deductions from salary, such as income tax payments and National Insurance contributions
- Net weekly household income (equivalised) before house costs:
    - composed of the same elements as net weekly household income but equivalised to take into consideration the household size and
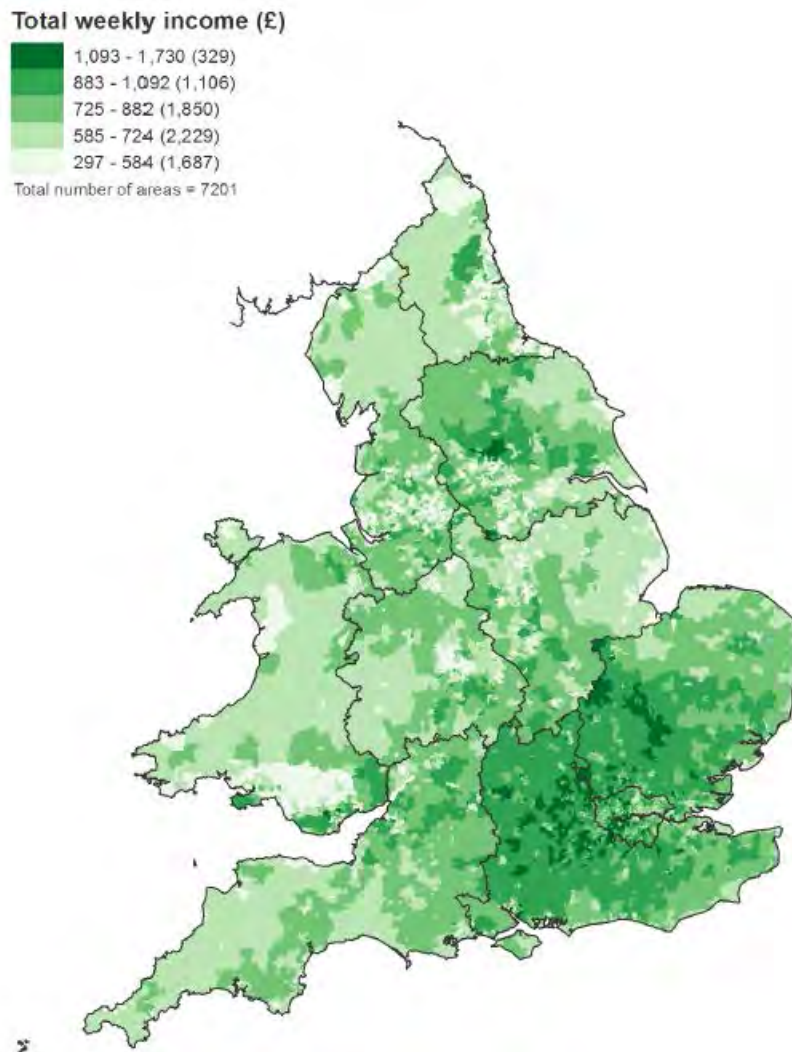
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[7]

http://www.neighbourhood.statistics.gov.uk/dissemination/Info.do?page=nessgeography/superoutputareasexplained/output-areas-explained.htm

composition. It represents the income level of every individual in the household

- Net weekly household income (equivalised) after housing costs:
  - adjusted for household size and composition after removing housing costs, such as rent, water and sewerage charges, mortgage interest payments and ground rent and service charges. It is useful for assessing the impact of the costs of housing for a given area

2.5 Map 1, below, from *SAIE*, illustrates the geographical variation at MSOA level in total mean weekly household income for England and Wales in 2011/12. The areas which had the lowest average total weekly household income were generally more spread out geographically than areas in which household income was higher which tended to be more concentrated.

Map 1: Mean total weekly household income by MSOA, England and Wales, 2011/12

Source: ONS, *SAIE* (page 4)

Method and data sources

2.6   The method for producing the estimates involves combining data from the Family Resources Survey (FRS) for 2011/12[8], with relevant administrative data sources (including benefit claimant counts, council tax bandings and tax credit claims). ONS produces a model which describes the relationship between the survey and administrative data. It then applies this relationship to the administrative sources at the small area level to produce estimates of weekly household income. ONS constrains the regional income estimates to the equivalent FRS regional statistics.

2.7   The FRS was chosen as the source for survey data for this study since it is the survey with the largest sample that includes suitable questions on income. The FRS allows four survey variables to be modelled and the average is used as the summary variable, i.e. the estimates produced are values of average MSOA income for the four income types. The FRS uses a stratified clustered probability sample drawn from the Royal Mail's small users Postcode Address File (PAF). This means that the sample is not distributed totally randomly across England and Wales, but that certain areas are first selected as primary sampling units (PSUs) and then households are selected for interview from these. In 2011/12, 24 addresses were selected per PSU.

2.8   For each different income type a number of records were found with values of income less than or equal to £1, these were removed from the sample data set. Additional records with extremely high total income values were removed as they would have had an unduly large influence on the model. For the net weekly (unequivalised and equivalised) income, records were removed where the net income was greater than the total income by £10. The net equivalised weekly income excludes households containing a married adult whose spouse is temporarily absent. This is because the data for net weekly income come from the Households Below Average Income data, another FRS dataset. The survey data file used contained 15,541 households from 1,146 postcode sectors. The final survey data file for England and Wales contained cases in 2,588 different MSOAs out of a total of 7,201.

2.9   ONS developed linear models for England and Wales that take into account the fact that each individual household belongs to a specific area. These models take the survey variable weekly household income – as the response variable and the area-level covariates as explanatory variables. The models relate the survey variable of interest (measured at household level) to the covariates for the small area in which the household is located. Once fitted the models can be used to produce estimates of the target variable at the small area level, i.e. the models can be used to produce MSOA level estimates of average household weekly income and calculate confidence intervals for the estimates.

2.10   The data sources used as covariates in the modelling were:

- 2011 Census[9]
- Department for Work and Pensions' (DWP) benefit claimants[10] (August 2011)

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[8] https://www.gov.uk/government/statistics/family-resources-survey-201112
[9] http://www.ons.gov.uk/ons/guide-method/census/2011/census-data/index.html
[10] http://tabulation-tool.dwp.gov.uk/flows/flows_on/tabtool.html

- Valuation Office Agency's Council Tax Bandings[11] (27 March 2011)
- HM Revenue and Customs' Child Tax Credit and Working Tax Credit[12] (2011)
- Department for Communities and Local Government's Change of ownership by dwelling price[13] (2009)

2.11 For all four types of income the response variable (weekly household income) is not normally distributed but positively skewed (the largest values differ from the mean more than the smaller values do). By using the natural logarithm of the appropriate type of income as the response variable, this skewness is reduced and it is assumed for the analysis that the transformed variable follows a normal distribution. All of the appropriate covariates (those expressed as percentages or proportions) were transformed onto the logit scale and both the transformed and original covariates were considered for inclusion in the models.

2.12 ONS initially selected significant covariates for inclusion in the models. Then with these significant covariates, it created interaction terms, tested for significance and, where appropriate, included them in the models. After modelling, ONS adjusted the modelled estimates to ensure they were consistent with the direct survey estimates at regional level for England and country level for Wales (known as benchmarking). It aggregated the model-based MSOA estimates of income to the region/country level and compared the two sets of estimates. It scaled all modelled MSOA-level estimates and their confidence intervals using the ratio of direct survey estimate to the aggregated model estimate at the region/country level.

2.13 ONS used the same method for producing the 2007/08 and 2011/12 estimates, with the same MSOA geography so that estimates for individual areas can be compared. It provided confidence intervals for both sets of estimates.

Accessibility and costs

2.14 ONS generally publishes the estimates around every three to four years, a frequency that ONS considers appropriate in terms of the production costs, the robustness of the estimates, and the expected use of these statistics. The interval was four years for this latest set of estimates, partly because ONS required 2011 Census data which became available in 2013 and time to put in place a data sharing agreement with DWP for access to the FRS data. (See paragraph 3.8 for further discussion of the time delay in relation to resources.)

2.15 ONS published the estimates[14] for years up to the latest release in tables using the Neighbourhood Statistics dissemination tool[15]. It also presented the 2007/08 estimates using an online interactive map[16]. It published some commentary and guidance alongside the estimates, within a technical report

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[11] https://www.gov.uk/government/statistics/council-tax-property-attributes
[12] https://data.gov.uk/dataset/tax_credit_claimants
[13] http://data.london.gov.uk/dataset/changes-ownership-dwelling-price-borough
[14]
http://neighbourhood.statistics.gov.uk/dissemination/Info.do?page=analysisandguidance/analysisarticles/small-area-model-based-income-estimates.htm
[15] http://www.neighbourhood.statistics.gov.uk/dissemination/
[16] http://www.neighbourhood.statistics.gov.uk/HTMLDocs/incomeestimates.html

and a user guide[17]. It subsequently published an article giving a detailed analysis of spatial differences in weekly household income[18] and a brief explanation of rural/urban differences using the MSOA estimates[19]. ONS changed its publication approach for the 2011/12 estimates, opting to release the estimates solely through its website[20]. (Accessibility issues are discussed further in paragraph 3.18.)

2.16   The costs for producing these estimates are predominantly staffing resource, given that these estimates reuse existing data sources. ONS told us that it costs approximately £27,500 to produce these estimates each time. Methodologists in ONS's Geography Division and Digital Technology and Methodology Directorate compiled and tested the 2011/12 estimates, while analysts in the Public Policy Division produced the statistical bulletin and supporting guidance documentation.

2.17   Sir Tim Berners-Lee first proposed a five star rating system for linked open data in 2010. Subsequently in June 2012, the UK Government published its Open Data White Paper: Unleashing the Potential, and began promoting to UK government departments the release of operational data in electronic open formats and equate to at least a three star rating in the five star scheme. ONS published the *Small area model-based income estimates* for 2011/12 in Excel format on the ONS website. This equates to a level of two star under the Scheme. (This issue is discussed further in paragraph 3.18.)

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[17]

http://neighbourhood.statistics.gov.uk/dissemination/Info.do?page=analysisandguidance/analysisarticles/income-small-area-model-based-estimates-200708.htm

[18]

http://www.neighbourhood.statistics.gov.uk/dissemination/Info.do?page=analysisandguidance/analysisarticles/understanding-income-at-small-area-level.htm

[19]

http://www.neighbourhood.statistics.gov.uk/dissemination/Info.do?page=analysisandguidance/analysisarticles/understanding-income-at-small-area-level-a-rural-urban-approach.htm

[20] http://www.ons.gov.uk/ons/rel/ness/small-area-model-based-income-estimates/2011-12/index.html

3   Assessment findings

User engagement

3.1   ONS used a variety of means to engage users with an interest in income estimates. It set up a group on the Knowledge Hub[21] and used the mainly local authority-based forum to inform users about development plans and to receive comments back from users. It also contacted users through StatsUserNet[22] – the online forum maintained by the Royal Statistical Society. ONS liaised with central government users, particularly in DWP, informing the policy development for estimates of poverty.

3.2   The ONS statisticians gave a number of presentations about the small area income estimates, including to the Statistics User Forum (SUF) conference[23], the Local Area Research and Intelligence Association (LARIA), and to other national statistical institutes. ONS has also developed links with the city regions[24] to better understand their data needs. ONS published the responses to a user consultation[25] about *SAIE* in 2011 and outlines types of user in the user guide[26] accompanying the statistics.

3.3   ONS updated users about the timing of the production of SAIE through the Neighbourhood Statistics website[27] (NeSS). It provided news about the next set of estimates, highlighting the expected timing of the release – initially around late 2013. It subsequently updated this information as the timetable changed, giving a broad indication of the likely release time (the publication subsequently occurred in October 2015). ONS notified known users about the new publication of *SAIE* through email and announced the release on both the Knowledge Hub and StatsUserNet.

3.4   ONS also flagged up its wide-ranging product consultation[28] in 2013. ONS made a decision at that time to continue with the production and release of *SAIE 2011/12*. ONS ran a further product consultation[29] in early 2016 (ending on 8 February) which included *SAIE* as a possible candidate for cessation. It has decided to maintain the production of these statistics.

3.5   The engagement with users has occurred ac*ross* the different teams in ONS involved in the production of the small area income estimates. It has tended to occur sporadically, rather than being part of a strategic approach to engaging

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[21] https://khub.net/

[22] http://www.statsusernet.org.uk/home

[23] http://www.statsusernet.org.uk/communities/all-discussions/printmessage?MID=3004&Printable=1

[24] http://www.ons.gov.uk/ons/rel/regional-trends/cities-analysis/city-regions/rpt.html

[25] https://www.neighbourhood.statistics.gov.uk/dissemination/Info.do?page=analysisandguidance/analysis articles/income-small-area-model-based-estimates-200708.htm

[26] http://www.ons.gov.uk/ons/rel/ness/small-area-model-based-income-estimates/2011-12/user-guide.pdf

[27] https://www.neighbourhood.statistics.gov.uk/dissemination/Info.do?page=analysisandguidance/analysis articles/small-area-model-based-income-estimates.htm

[28] http://www.ons.gov.uk/ons/about-ons/get-involved/consultations-and-user-surveys/consultations/statistical-products-2013/index.html

[29] http://www.ons.gov.uk/aboutus/whatwedo/statistics/consultationsandsurveys/allconsultationsandsurveys/consultationonchangestoonsproducts2015

users, reflecting the lack of ownership of the statistics by any one business area in ONS. The resource issues associated with *SAIE* are discussed further in paragraph 3.8.

3.6   User feedback provided to the Assessment team demonstrated a strong interest in using small area estimates of income, with a number of local government users describing their use of *SAIE*. However, there was also dissatisfaction with the current estimation method and outputs. These users, particularly in commercial organisations and some councils, said that *SAIE* was of little use in its current form for two main reasons. It measures mean income rather than median income and so there is a greater tendency for the outliers to skew the average. These users were keen to have the income distribution in each small area, as well as the median weekly income. Also, the estimates are given for middle-layer super output areas (MSOAs) which are too large for these users' needs. They want to be able to aggregate estimates for lower-level super output areas into bespoke geographies. A further criticism in the feedback received by the Assessment team was that the estimates were not sufficiently timely – a number of the users regarded 2011/12 estimates as out of date when published in 2015.

3.7   The users that we contacted as part of this Assessment were unaware of the current research by various statistical teams in ONS. ONS has a project to investigate the development of median income estimation. This work is in direct response to feedback from users. ONS, however, has not provided users with a clear picture of the steps that it is taking to better meet their needs. ONS told us that it is also undertaking related research as part of the Census Transformation Programme to incorporate administrative data on pay and benefits, such as from the Survey of Personal Incomes[30], that will help determine whether it can produce either direct estimates or a further enhanced modelled estimate of income for smaller areas. An integrated and coherent engagement plan should result in communication that is more effective, leading to a better understanding among users about the development of the statistics, and among the statisticians about the use made of the estimates. As part of the designation as National Statistics, ONS should:

a)   Develop and publish an integrated engagement strategy, drawing together the variety of activities with users across the relevant statistical teams in ONS into a coherent plan

b)   Publish its development plans for the small area estimation of income, including median income estimates and availability at lower super output area level, and provide regular updates to users about its progress[31]

(Requirement 1).

Resources and planning

3.8   *SAIE* illustrates the success of bringing together expertise from across ONS and a range of data sources from across government. However, the Authority is concerned at the lack of strategic oversight and key leadership of these important statistics that has led to business areas prioritising other statistics over the production of *SAIE*. This in turn contributed to a delay in the

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[30] https://www.gov.uk/government/collections/personal-income-by-tax-year
[31] In relation to Principle 1, Practice 1 of the *Code of Practice*

completion of the estimates, despite the availability of the source data from the 2011 Census and the FRS, and reduced the public value of the statistics. It also impacted the engagement approach, leading to occasional and disjointed contact with users. ONS told us that it has assigned responsibility to the Public Policy division, to lead on addressing the requirements from this Assessment report. As part of the designation as National Statistics, ONS should:

a) Ensure that its statistical planning takes account of users' needs, particularly in relation to the timely publication of *SAIE*, and is transparent about priority setting, explaining the reasons for its choices

b) Ensure that the resources allocated to the production of *SAIE* are sufficient to maximise the public value of the statistics[32]

(Requirement 2).

Sound methods and assured data quality

3.9   ONS set out the methods used to produce *SAIE* and the reasons for the choices made within the technical report[33] accompanying the release of the estimates. It also provides a user guide[34] for non-expert users. The supporting material provides clear descriptions of the method and the testing of the models. ONS provides guidance about interpreting the mean income estimates, such as making comparisons between areas and over time.

3.10   ONS recognises that users would like income estimates at the lowest geographical level possible. ONS regards MSOAs as the lowest level that provides adequate precision, and believes that a lower level would not be sufficiently accurate for publication. It provides confidence intervals to guide users on the precision of the estimates. It explains these in the user guide and technical report. One user recommended including the guidance about the confidence intervals alongside the estimates in the data file. We suggest that ONS include an explanation about confidence intervals in the SAIE data table.

3.11   ONS says that it rounds the estimates to the nearest £10 to not imply a greater level of accuracy than the estimates possess; however, the data table presents the data to the nearest penny. We suggest that ONS review the presentation of the data file to ensure that it is consistent with its decisions about the appropriate level of rounding.

3.12   A user highlighted concerns about the impact of the estimation method which tends to shrink estimates towards the average level of income for the whole population (so estimates at the upper end of the scale tend to be under estimated and vice versa)[35]. This user suggested that some results for London areas are implausible, observing that some MSOAs in highly affluent boroughs had lower weekly average income estimates than for MSOAs in other less affluent boroughs. As part of the designation as National Statistics, ONS should

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[32] In relation to Principle 1, Practices 3 and 4, and Principle 7, Practice 1 of the *Code of Practice*
[33] http://www.ons.gov.uk/ons/rel/ness/small-area-model-based-income-estimates/2011-12/technical-report.pdf
[34] http://www.ons.gov.uk/ons/rel/ness/small-area-model-based-income-estimates/2011-12/user-guide.pdf
[35] See page 43 of the Technical report

explore the concerns raised about the quality of the estimates for London areas, and publish the findings[36] (Requirement 3).

3.13   In February 2015 the Authority published a regulatory standard[37] that confirms the quality assurance (QA) arrangements that are required for statistics compiled using administrative data to comply with the *Code of Practice*. The *Administrative Data Quality Assurance Toolkit*[38] is the mechanism that the Authority is using to determine compliance in relation to four areas of practice:

- operational context and administrative data collection
- communication with data supply partners
- QA principles, standards and checks by data suppliers
- producers' QA investigations and documentation

3.14   The QA Toolkit sets out that the judgment by statistical producers about the suitability of the administrative data for use in producing official statistics should be pragmatic and proportionate. It should be made in the light of an evaluation of the likelihood of quality issues arising in the data that may affect the quality of the statistics. It should also reflect the nature of the public interest served by the statistics. Statistical producers should determine the types of assurance and documentation required to inform users about the quality assurance arrangements for administrative data.

3.15   ONS's Digital Technology and Methodology Directorate checked the models and estimates. It produced a detailed review of the methods and the resulting models and set out why it was satisfied that it applied the best model. ONS also outlines in the technical report the various sources used in the preparation of the estimates; however, it provided little insight into the accuracy of the administrative data sources used in the modelling. ONS incorrectly stated in the supporting documentation that all the data sources are existing National Statistics. ONS did not sufficiently explain the nature of the sources, limitations in the data or how it overcomes them to produce robust statistics. As part of the designation as National Statistics, ONS should outline the data assurance arrangements for the administrative data used to produce *SAIE*, making clear why it regards the data as sufficiently robust for this purpose[39] (Requirement 4). As part of meeting this requirement, ONS should consider the Authority's Report *Quality Assurance of Administrative Data*[40].

3.16   *SAIE* covers England and Wales only. ONS does not explain why the estimates are only for these countries and does not say that equivalent figures for Scotland or Northern Ireland are not available. It also does not describe coherence issues or potential overlap with the income domain of the Indices of Deprivation[41] produced by Department for Communities and Local Government. As part of the designation as National Statistics, ONS should provide information about the comparability and coherence of *SAIE* with other

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[36] In relation to Principle 4, Practice 1 of the *Code of Practice*
[37] http://www.statisticsauthority.gov.uk/assessment/monitoring/administrative-data-and-official-statistics/index.html
[38] http://www.statisticsauthority.gov.uk/assessment/monitoring/administrative-data-and-official-statistics/quality-assurance-toolkit.pdf
[39] In relation to Principle 4, Practice 2 and Principle 8, Practice 1 of the *Code of Practice*
[40] https://www.statisticsauthority.gov.uk/monitoring-and-assessment/monitoring/administrative-data-and-official-statistics/
[41] https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015

similar statistics and clarify the distinctive purpose that *SAIE* serve[42] (Requirement 5).

Presentation and accessibility

3.17 The main statistical output is a data table containing mean income estimates for MSOAs. ONS produced a statistical bulletin to accompany the estimates for the first time in 2015. It clearly describes the four income measures, and provides illustrations using maps and charts. The bulletin includes a brief explanation about each measure and outlines when each would be appropriate for use. It also provides a helpful case study to illustrate analyses of income estimates with other statistics, investigating housing accessibility in small areas. The users who provided feedback during the course of the Assessment were positive about the presentation of the bulletin and supporting material. ONS, however, does not make clear that the statistics are National Statistics.

3.18 Prior to 2015, ONS released the small area income estimates through the Neighbourhood Statistics (NeSS) website. ONS decided to not release the 2011/12 based estimates through NeSS. Some users said that they would like to be able to access the estimates through Nomis[43], ONS's official labour market statistics web tool managed by Durham University. ONS did not release these MSOA estimates in a form that is machine readable – the estimates are only available in an Excel spreadsheet. The file format of the release equates to a level of two stars under the Five Star Scheme that forms part of the Open Standards Principles proposed in the *Open Data White Paper: Unleashing the Potential[44]*. As part of the designation as National Statistics, ONS should publish *SAIE* in an open format that equates to at least a three star level under the Five Star Scheme[45] (Requirement 6). In meeting this Requirement, we suggest that ONS consider ways of encouraging the wider use of *SAIE* by making the statistics available through other means such as Nomis.

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[42] In relation to Principle 4, Practices 3 and 6 of the *Code of Practice*
[43] http://www.nomisweb.co.uk/
[44] http://data.gov.uk/sites/default/files/Open_data_White_Paper.pdf
[45] In relation to Principle 8, Practice 6 of the *Code of Practice*

Annex 1: Compliance with Standards for Statistical Reports

A1.1　In November 2012, the Authority issued a statement on *Standards for Statistical Reports*[46]. While this is not part of the *Code of Practice for Official Statistics*, the Authority regards it as advice that will promote both understanding and compliance with the *Code*. In relation to the statistical reports associated with *Small area model-based income estimates*, this annex comments on compliance with the statement on standards. The comments included in this annex are based on a review of report for 2011/12 estimates[47].

A1.2　In implementing any Requirements of this report (at paragraph 1.10) which relate to the content of statistical reports, we encourage ONS to apply the standards as fully as possible.

Include an impartial narrative in plain English that draws out the main messages from the statistics

A1.3　The bulletin lists the geographic coverage as 'other' rather than England and Wales. ONS presents an impartial description of the small area income estimates in the *SAIE* bulletin. The bulletin begins with a list of key points for the latest year. It also describes the variation in total and net weekly income estimates in MSOAs in England and Wales.

A1.4　Overall, the narrative throughout the bulletin is helpful. It defines key concepts such as total weekly household income and equivalisation. However, it incorrectly describes the distribution of mean weekly household income by MSOA as negatively skewed; the distribution is positively skewed, as illustrated in Figure 1 of the bulletin and as described in the technical report on page 14. The bulletin refers to the top 50 MSOAs containing 38 for London and explains the arbitrary nature of the comparison. It provides a useful accompaniment to the detailed estimates given in the accompanying data file.

Include information about the context and likely uses of the statistics

A1.5　ONS provides a description of use – referring to central and local government for policy development and allocating grants, as well as by businesses, academics for site planning and combining with other indicators to assess relationships between income and local economies. It uses a comparison of average house price against weekly household income, showing the variation in housing affordability, to illustrate how the estimates can be used in conjunction with other sources.

A1.6　It describes the four different income measures and has a description of when each would be an appropriate measure. It also gives some additional contextual explanations which are helpful – for example, page 15 describes how the variations in relation to urban versus rural area characteristics and regarding transport links can influence house price.

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[46] http://www.statisticsauthority.gov.uk/news/standards-for-statistical-reports.html
[47] http://www.ons.gov.uk/ons/rel/ness/small-area-model-based-income-estimates/2011-12/index.html

Include information about the strengths and limitations of the statistics in relation to their potential use

A1.7 The bulletin includes background notes at the end which include some of the limitations of the statistics. ONS gives more detailed information in the technical report – particularly in the section on guidance on the use of the estimates (page 40). The bulletin signposts less-experienced users to the user guide for an introduction into the method and guidance about using the estimates.

A1.8 The technical report provides guidance (section 7) about using the estimates to make comparisons over time and gives ONS's reasons for not providing these in the bulletin – specific comparisons are suitable for areas when boundaries have not changed. It warns that the selection of different covariates for previous models may induce changes in the estimates for particular areas where no underlying change has actually taken place.

Be professionally sound

A1.9 The bulletin and technical report both emphasise the uncertainty around the estimates. They describe how to interpret the confidence intervals. The technical report provides a detailed description of the model testing and variables used to construct the modelled estimates in 2007/8 and 2011/12. It illustrated the results of the modelling, for example, by providing charts that show the variation across all MSOAs (with confidence intervals) for each of the four income types.

Include, or link to, appropriate metadata

A1.10 The background note in the bulletin provides some information about quality issues, signposting users to the user guide and technical report. ONS provides detailed information in the technical report.

A1.11 ONS provides confidence intervals for the modelled estimates in the spreadsheet for each of the income types. The bulletin and supporting material give advice on interpreting the confidence intervals. The technical report provides a detailed explanation of why ONS is confident that the estimates are sufficiently accurate based on testing the model in relation to five diagnostic tests.

A1.12 Neither the bulletin nor the technical report provides sufficient information about the quality of the administrative data used to produce the modelled estimates. They do not link to the quality and methods information published by the source statistical producers. They also do not sufficiently explain the judgment that the sources are of suitable quality for use in producing the income estimates.

A1.13 The material about sources appears out of date – for example, there is no mention of employment and support allowance, or universal credit. ONS does not provide links to the source publications or websites. The data sources annex (B.7) and section 2.2 of the user guide are confusing in referring to 'DWP benefit claimant counts' (meaning DWP benefit data rather than the ONS Claimant Count). The user guide (page 9) says that all the administrative data sources are National Statistics which is incorrect.

Annex 2: Summary of assessment process and users' views

A2.1 This assessment was conducted from August 2013 to April 2016.

A2.2 The Assessment team – Penny Babb and Emma Bowditch (until January 2014) – agreed the scope of and timetable for this assessment with representatives of ONS in August 2013. The Written Evidence for Assessment was provided on 15 November 2013. ONS delayed the production of the small area income estimates, subsequently releasing the statistics in October 2015. The Assessment team reviewed the draft statistical bulletin and supporting material in the weeks prior to the release and provided comments to ONS. It subsequently met ONS during February 2016 to review compliance with the *Code of Practice*, taking account of the written evidence provided and other relevant sources of evidence.

Summary of users contacted, and issues raised

A2.3 Part of the assessment process involves our consideration of the views of users. We approach some known and potential users of the set of statistics, and we invite comments via an open note on the Authority's website. This process is not a statistical survey, but it enables us to gain some insights about the extent to which the statistics meet users' needs and the extent to which users feel that the producers of those statistics engage with them. We are aware that responses from users may not be representative of wider views, and we take account of this in the way that we prepare Assessment reports.

A2.4 The Assessment team received 20 responses from the user consultation. The respondents were grouped as follows:

Local government	8
Commercial (including two user groups)	4
Voluntary sector	4
Academic	3
Non-departmental public body	1

A2.5 The main users appear to be some local authorities who are unable to either generate their own small area estimates or purchase them from private commercial producers. The users of *SAIE* said that it gives a broad understanding of the income estimates, illustrates appropriate uses of the estimates well, and provide some useful maps. They also said that the guidance is helpful for different types of users.

A2.6 Unusually, we received more responses from non- or potential users (14) than from actual users (6). The user feedback showed potential interest in using income estimates for small areas but said that the current ONS estimates do not meet the majority of users' needs, since they are mean incomes estimates rather than median estimates and are for MSOAs rather than LSOAs. These issues featured in the user survey run by ONS in 2011. At that time, ONS responded indicating why it is unable to meet these needs – it said it would

need a large sample size for the FRS, to achieve the greater relative power in the model.

A2.7   A number of the users regarded the estimates as out of date and not released frequently enough: 'timeliness is a considerable obstacle to the direct use of the estimates'. Commercial users were interested in obtaining the administrative data on income. Some users observed that the confidence intervals are wide and a potential user suggested that the method should address the impact of shrinkage to average level which led the data for some London areas to not appear plausible.

A2.8   ONS statisticians told us that knowledge of modelling small area data has improved over the last few years. With further technical developments, they suggested that it might be possible to develop median income measures. It is working on such as estimates within its Empirical Best Predictor[48] project.

Key documents/links provided

Written Evidence for Assessment document
Draft statistical bulletin and supporting documentation

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[48] https://ec.europa.eu/eurostat/cros/sites/crosportal/files/Whitworth-etal%20%20Small%20Area%20Estimates%20of%20Income%20_%20unblinded%20v2.pdf

www.statisticsauthority.gov.uk