

Background Quality Report – Small Area Population Estimates

This report provides information on the quality of the data used to produce the official statistics: [2020 mid-year population estimates for Small Areas](#). It informs users about the quality of the information upon which they may be drawing conclusions and making decisions.

The report is structured around the five quality dimensions for statistical outputs (from the [European Statistics Code of Practice, PDF \(458 KB\)](#)). The UK Statistics Authority's [Code of Practice for Statistics](#) requires that:

Q3.3 *The quality of the statistics and data, including their accuracy and reliability, coherence and comparability, and timeliness and punctuality, should be monitored and reported regularly.*

Introduction

Context for the quality report.

[Small Area Population Estimates](#) for Northern Ireland are released in November each year; they follow on from the Mid-year Population Estimates and refer to the population at June 30th of the reference year.

The Small Area Population Estimates are a further refined view of the population below Super Output Area level. They can be used as building blocks for population estimates of different geographies, which inform planning and provision of services. They are used as a denominator to calculate rates at “Census Small Area” level using data available on the [Northern Ireland Neighbourhood Information Service website](#). The Department of Health, Social Services and Public Safety uses the population estimates for Small Areas in combination with those for larger geographies to create multiple health indicators for bespoke geographies. Small Areas can be aggregated into [Neighbourhood Renewal Areas](#) – areas with high levels of deprivation that have been chosen to receive additional support.

Mid-year Population Estimates are produced using the ‘cohort component’ and ‘ratio change’ methods. These methods do not perform well for Small Areas, particularly the ratio change method. As a result, population estimates for Small Areas are derived using the **apportionment method**. In short, this method breaks down the known population of a larger area into smaller areas using an indicator of population for the smaller areas. In the case of Small Area Population Estimates, the larger areas which are broken down are the 890 Super Output Areas in Northern Ireland. See the Methodology section of the [2014 Small Area Population Estimates statistical bulletin PDF \(381kb\)](#) for further detail on the apportionment methodology.

Small Area Population Estimates are produced as population totals only. Due to the large number of areas (4,537) with an average population size of 400, it is not possible to disaggregate the Small Area Population Estimates by age or gender.

Relevance

The degree to which the statistical product meets user needs in both coverage and content.

As stated, Small Area Population Estimates are released in November each year following the Mid-year Population Estimates in June. As a result, the Small Area estimates are released roughly 17 months after the reference date. The extra time taken to produce the Small Area Population Estimates can be attributed to time taken for production and further quality assurance required at this lower geographical level.

Historically, population estimates for small area were only available from the Census. Figures relating to Small Area Population estimates for Northern Ireland were first published by NISRA in 2010, primarily to meet the requirements for the 2010 Multiple Deprivation Measures. However, it was recognised that there is a wider interest in these statistics to aggregate small area figures into higher geographies and to include them in the Northern Ireland Neighbourhood Information Service (NINIS), for example, through interactive maps.

Users of Small Area Population Estimates can be categorised into two broad groups:

1. Users for which the absolute numbers are important.
2. Users for which the population figures are used in a variety of rates and indicators.

In addition, Small Area Population Estimates are provided to users aggregated into Neighbourhood Renewal Areas - areas with high levels of deprivation that have been chosen to receive additional support. These estimates are disaggregated by sex and broad age bands to help users with planning services for the most deprived areas in Northern Ireland.

Small Area Population Estimates are also used by some users to approximate the population of settlement areas in Northern Ireland. NISRA have published a [small area to settlement look-up table and guidance documentation](#) to aid in this analysis.

District Electoral Areas (DEAs)

In 2008, the Northern Ireland Assembly approved the reform of Local Government, which resulted in a redraw of the DEA geography. The redrawing of DEA boundaries did not take cognisance of the underlying SOA or Small Area geography. Given that the methodologies adopted to produce population estimates are primarily based on these two geographies, estimates could not be produced on an exact basis for the new DEA geography.

To produce population estimates for DEAs, NISRA published a [Small Area to DEA look-up table Excel \(4.1mb\)](#) which allowed users to approximate the population of DEAs. However, the main drawback from this approach was that population estimates for DEAs using this method were limited to population totals only. In response to this limitation, a revised approach to estimating the population of the 80 DEAs by age and sex was developed.

Population estimates for DEAs by age and sex were developed primarily by aggregating population estimates for Small Areas using the aforementioned lookup table. However, in a second step, any Small Area that is split by a DEA boundary has had its population attributed to the appropriate DEA on the basis of the proportion of its population in that DEA at the time of the 2011 Census. The allocated proportions have been applied unadjusted throughout the time series. In addition, the same proportions are applied to the age-sex distribution across the Small Areas to produce DEA estimates by age and sex. A detailed example of this methodology is available within the [DEA bulletin PDF \(2.1mb\)](#) on the NISRA website.

It is accepted that the proportions of the population calculated for Small Areas parts can change as we move away from 2011, and this can have an effect on the accuracy of the apportionment for future years. However, since there is an absence of up to date data to improve these figures, the information in this release is seen as a best estimate.

Accuracy and Reliability

The proximity between an estimate and the unknown true value.

The reliability of estimates is difficult to quantify due to the range of information used in the construction of the estimates. Some difficulties with population estimates for Small Areas do arise due to a combination of their small population (400 people on average) and small geographical area.

Quality of data sources

Population estimates are produced using information from several data sources including the previous census, survey data and administrative registers. The data sources used are deemed to be the best that are available nationally, however, the estimates are therefore subject to the coverage and error associated with these data sources. A full quality assurance of the data sources, which contribute to the Mid-year Population Estimates, is available from the [Population Estimates and Projections QAAD](#).

Migration is one of the most difficult components of population change to measure. Higher Education Statistics Agency (HESA) data is used to account for students who move from the parental home to their place of study. Data is available by single year of age, sex, home address and term time address.

More detailed checks are required for this data source, particularly on the term-time address a student provides. Predominantly, first-year students may not know the postcode of their term time address, or put the postcode of the university campus. Such geo-spatial issues are resolved by spreading these records over university specific student areas.

The number of armed forces stationed in Northern Ireland – broken down by Local Government District (LGDs), single year of age and sex – is provided by the Ministry of Defence. NISRA creates their own distribution of Armed Forces to Census small

Areas within Local Government Districts, with larger concentrations in and around barracks as reported in the 2011 Census. For those LGDs without barracks, Armed Forces are spread equally over all Census Small Areas.

Geo-spatial referencing

At the basis of all data sources, there are individual records based on the person's usual address of residence. There are generally two methods used in the spatial allocation of records. First, if the exact location of the usual address is known, it can be determined within which Small Area boundary it is located.

In the second method, the reported postcode – or a cleansed version of it – can be combined with the Central Postcode Directory, a lookup table that provides, for each postcode, different administrative and statistical geographies based on the geographically central property ('centroid'). This method is used for data from the School census, HESA, and Pensions and related benefits.

The Central Postcode Directory becomes less accurate when looking at smaller geographical areas. Boundaries of statistical geographies are not necessarily aligned with those of postcodes. As a rough guide, the postcode lookup for Census Small Areas is accurate within 15 per cent. The population estimates for Small Areas use a combination of data sources, with those relying on postcode data in the minority.

Impact of revision – 2012 population estimates

Population estimates for Small Areas for mid-2012 were revised from those originally published in April 2014. This is the result of a change in the methodology for disaggregating Super Output Area level estimates post 2011 Census, but also from the availability of data for subsequent years. When looking at the trends between mid-2011 and mid-2014, it became clear that some population estimates for 2012 were in fact anomalies in the underlying data.

In many cases, the geo-spatial allocation of data was the problem, and often a peak and a trough in two Small Areas within a Super Output Area occurred. Therefore, it was decided to revise the Small Area estimates only, and constrain to the unchanging published super Output Area estimates.

The vast majority of Small areas (88.7 per cent) remained unchanged. Small Areas with a minor population change are those affected by constraining to the Super Output Areas population. Of the 435 Small Areas that changed by less than one per cent, 401 Small Areas (92.2 per cent) changed by only one person.

Small Area limitations

There is particular difficulty in estimating the population of Small Areas with a high population turnover or churn, a large communal population or other populations that are insufficiently captured by administrative data sources.

Population turnover measures all movement of residents into and out of an area, whilst population churn also measures movements within an area. As some of these moves are unrecorded in administrative data, and there are lags in updating details that differ

between sources, estimation of the population in areas with high turnover or churn becomes more difficult. People of young working age are particularly mobile, for example the student population.

To address the issue of high population churn we have used the 2011 Census to identify Small Areas with large numbers of students, communal populations (such as defence establishments, prisons and student halls of residence) and large numbers of rented accommodation. The 2011 census is still sufficiently recent to identify such areas, but it does not exclude the possibility of new establishments being built and current establishments being closed. Users should take care when using the population estimates in those areas.

Timeliness and Punctuality

Timeliness refers to the time gap between publication and the reference period. Punctuality refers to the gap between planned and actual publication dates.

Small Area population estimates for Northern Ireland are published annually in November each year. For a particular mid-year (30th June), they are available roughly 17 months after the reference date. The extra time taken to produce the Small Area Population Estimates can be attributed to time taken for production and the further quality assurance required at this lower geographical level.

The publication schedule for the Population and Migration statistics branch of NISRA is available online and details all planned publication dates 12 months in advance. This schedule can be found on the [NISRA website](#).

In addition, a one month pre announcement on all statistics is made on Gov.uk detailing the exact date of publication for the Mid-year Population Estimates. An example of which can be found on [Gov.uk](#).

All statistical publications have been released to the planned publication schedule set out at the beginning of the year.

In the unlikely event of a change to the pre announced release schedule, public attention would be drawn to the change and the reasons for the change explained fully, as set out in the Code of Practice for Official Statistics.

Accessibility and Clarity

Accessibility is the ease with which users are able to access the data, also reflecting the format in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the metadata, illustrations and accompanying advice.

Small Area population estimates are available, free of charge, online from the [NISRA website](#). Links from the [GOV.UK release calendar](#) also provide the release date and location of each new set of population estimates one month in advance of publication.

The estimates are published as statistical tables only and can be downloaded in Excel format from the NISRA website.

In addition, detailed data are now published in usable formats (.CSV) as part of the open data initiative on [OpenDataNI](#). Associated metadata accompanies the data files which details information in relation to variables, timeframes, coverage and methodology.

Users with any further queries can contact the responsible statistician by phone (028 9025 5156) or email (census.nisra@gov.uk).

Coherence and Comparability

Coherence is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar. Comparability is the degree to which data can be compared over time and domain.

Small Area population estimates are consistent with the national mid-year estimates, whereby population totals sum to higher Super Output Area geographies.

The Office for National Statistics (ONS) and National Records of Scotland (NRS) produce small area population estimates for [England, Wales](#) and [Scotland](#) respectively. These estimates are produced using different methodologies from those used by NISRA to produce small area estimates for Northern Ireland. A paper looking at the consistency of methods used for small area population estimates across the UK countries is available on the [NISRA website](#).

Where possible Northern Ireland small areas have been kept identical to the 2001 Census Output Areas to ensure comparability over time, however in a number of cases this was not possible and the new 2011 Small Areas were created by merging one or more of the 2001 Output Areas together.

In total 4,175 of the new 2011 Small Areas are coterminous with a single 2001 Census Output Area. Direct comparisons between these areas can be made. The remaining Census Output Areas were merged to create the 2011 Small Areas. Table 1 shows how many 2001 Output Areas were combined to make up the 2011 Small Areas.

Table 1: How many 2001 Output Areas were combined to make up the 2011 Small Areas

| Number of 2001 Census Output Areas combined | Number of 2011 Small Areas created |
|---------------------------------------------|------------------------------------|
| 1 | 4,175 |
| 2 | 262 |
| 3 | 79 |
| 4 | 21 |
| All Areas | 4,537 |

Trade-offs between Output Quality Components

Trade-offs are the extent to which different aspects of quality are balanced against each other.

The Small Area population estimates are published as unrounded totals to enable users to carry out further analysis. However, in general the precision of the estimates could be considered to be no better than to the nearest 100. Small area population estimates are not broken down by sex and single year of age as the total population could be split by thousands of combinations of Small Area, sex and single year of age. The large number of combinations yield very small results.

Additionally, population estimates for District Electoral Areas and Neighbourhood Renewal Areas are produced by sex and broad age bands only. The reason single year of age estimates are not available for these two geographies are twofold:

1. Estimates have not been quality assured at this level of detail.
2. The small numbers involved are not considered sufficiently large enough for a robust application of our ratio change methodology.

Further information on the methodology used to create Mid-year Population Estimates is available within the [methodology report](#).

Assessment of User Needs and Perceptions

The processes for finding out about users and uses, and their views on the statistical products.

Information on user's needs for, and perceptions of, the population estimates are collected by:

- user surveys, for example, the latest population and migration statistics user feedback survey was undertaken for 2018/19. The user feedback survey allows our users to comment on existing outputs and put forward changes in their requirements. The [results of the latest user feedback survey](#) have been published.
- contact with individual users – drawing on the evidence provided by the many users who contact the Population and Migration Statistics team with requests for, or queries on, the estimates.
- user groups, such as the [Demographic Statistics Advisory Group](#), which allows the Population and Migration Statistics team to consult with personnel who represent the interests of the main user communities.
- User engagement event – our most recent user engagement event was held in February 2020 and details of this event can be found on the [stakeholder engagement](#) section of our website.

Enquiries and suggestions

- The [revisions policy](#) for Northern Ireland population statistics is available online.
- We welcome feedback from users on the content, format and relevance of this release. Please send feedback directly to census@nisra.gov.uk.
- Follow NISRA on [Twitter](#) and [Facebook](#).
- All media inquiries should be directed to the DOF Press Office:

Telephone: 028 9081 6724

Email: dof.pressoffice@finance-ni.gov.uk

- Further statistical information can be obtained from NISRA Customer Services:

Telephone: 028 9025 5156

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