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Population Estimates for Small Areas (2013-2014, revised 2012)

Key Points:

- The Northern Ireland population at 30 June 2014 is estimated to be 1.840 million, an increase of 126,500 (7.4 per cent) since mid-2004.
- The largest population growth can be found in Small Areas with new housing developments, often on the outskirts of towns and villages.
- From mid-2004 to mid-2014, the population in 40 of the 4,537 Small Areas more than doubled.
- Small Areas with large population decline over the past decade include those that had either a closure or reduced occupation of army barracks.
- The population in eight of the 4,537 Small Areas more than halved between mid-2004 and mid-2014.
- Super Output Areas continue to be the main geography for describing population change for smaller geographical areas.

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Note 1: Throughout the report figures have been presented in a rounded form to ease readability. For example, numbers have been presented to the nearest. However, all calculations have been undertaken on the basis of unrounded numbers which will, in some instances, give rise to apparent discrepancies.

Note 2: Previously, population estimates for the smallest geographies within Northern Ireland were released under the publication title of “Small Area Population Estimates”. Accordingly, smaller geographies, such as Census Output Areas and Super Output Areas, etc, were all referred to as “small areas”. With the release of the 2011 Census, the Census Output Areas were updated, and this new geographical area was termed “Small Areas”. As such, this publication is renamed “Population Estimates for Small Areas in Northern Ireland”. To avoid confusion, the geographical area “Small Areas”, created for the 2011 Census, will be referred to as “Census Small Areas” throughout the rest of bulletin.

1. Introduction

Headline population estimates for Northern Ireland were published on 4 June 2015, including estimates for areas within Northern Ireland down to Super Output Areas. This bulletin details the key findings of population estimates for the 4,537 Census Small Areas in Northern Ireland, with new estimates for mid-2013 and mid-2014, as well as revised estimates for mid-2012. To provide context to these estimates, this bulletin also includes a brief analysis of population estimates for Northern Ireland and Super Output Areas (see [report](#) for further information).

Population estimates for Census Small Areas provide 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 can inform planning and the provision of services. They are used as the denominator to calculate rates at “Census Small Area” level using data available on the Northern Ireland Neighbourhood Information Service website ([NINIS](#)). The Department of Health, Social Services and Public Safety uses the population estimates for Census Small Areas in combination with those for larger geographies to create multiple health indicators for bespoke geographies. Census Small Areas can be aggregated into [Neighbourhood Renewal Areas](#) – areas with high levels of deprivation that have been chosen to receive additional support. Population estimates for these areas are a key piece of evidence to review action plans and assess the effective use of public funds.

Given the large number of Census Small Areas in Northern Ireland (4,537), it is not feasible to discuss the population change in each of them within this bulletin. Therefore, commentary will focus on those areas with the greatest growth or decline. It is also more reliable to assess population change over a longer period, due to the small population. For this reason, all changes over time stated within this bulletin relate to a ten-year period (mid-2004 to mid-2014). This bulletin also details the quality of these estimates and provides guidance on the use of these statistics. It is recommended that users familiarise themselves with the quality issues and limitations associated with population estimates for Small Areas, and reflect on this when reporting at this level.

2. Background

Historically, population information for small geographical areas was only available from the Census, where figures were available for electoral wards. In 2005 however, the Social Disadvantage Research Centre (University of Oxford) created [2003](#) population estimates for Super Output Areas and Census Output Areas as part of the Multiple Deprivation Measure 2005.

Figures relating to the release “Small Area Population Estimates for Northern Ireland” were first published by NISRA in March 2010, primarily to meet the requirements for the Multiple Deprivation Measure 2010. Estimates were released for each year from [2001 to 2008](#), for

- a) 890 Super Output Areas (SOAs) by sex and four broad age bands; and
- b) 5,022 Census Output Areas (COAs, totals only).

Subsequent estimates for 2009 (May 2011) and 2010 (September 2011) were published for Super Output Areas only, amid concerns about the 2001 Census figures for Census Output Areas.

In preparation for the 2011 Census, a review of statistical geographies was carried out. This resulted in a boundary change of three pairs of [Super Output Areas](#), and the creation of 2011 [Census Small Areas](#). Where possible, Census Small Areas were kept identical to the 2001 Census Output Areas to ensure comparability over time. However, in a number of cases this was not possible. New areas were created by merging two or more 2001 Census Output Areas, resulting in 4,537 Census Small Areas.

In April 2014, new estimates were published for [mid-2011 and mid-2012](#), as well as revised estimates for the period mid-2001 to mid-2010 in light of the 2011 Census results (see [revision policy](#)). These new and revised estimates included figures for the updated Super Output Areas and the new Census Small Areas. Within this release, population estimates by Census Small Area were created by disaggregating estimates for Super Output Areas. However, it was found that in certain cases, population estimates for Census Small Areas started to drift post-2011. When moving further away from 2011, administrative data sources become more important. There are a number of Census Small Areas for which the administrative data sources were distinctly different from the Census estimates in 2011. This gave rise to concerns about their future use in disaggregating Super Output Area level population estimates. In addition, it is known that spatial allocation to small geographical areas, particularly when using postcode-based data sources, can lead to inaccuracies (see [Quality](#) section). For these reasons, the publication of Census Small Area level population estimates was postponed after the release of the mid-2012 estimates to allow time for a more detailed quality assurance of the data and a review of the methodology.

It is important to note that these concerns only related to the methodology to disaggregate Super Output Area estimates to Census Small Area estimates. Therefore, since the publication of the 2013 population estimates in June 2014, population estimates for areas within Northern Ireland are created using the Small Area Population Estimates methodology: estimates are created for each of the 890 Super Output Areas, which are then aggregated to create estimates for larger geographies, such as Local Government Districts and Parliamentary Constituencies (see [Methodology Paper](#) for more information). As a result, there is a single

release in June with a statistical bulletin, which provides analysis and commentary on the population changes for multiple geographies (but excluding Census Small Areas).

Further investigations into the methodological issues in creating population estimates for Census Small Areas have led to a revised approach of incorporating additional information (see [methodology, Section 6](#)), which has now resulted in new estimates for mid-2013 and mid-2014. As the new method applies to post-Census estimates, figures for mid-2012 have also been revised (see [impact of revision, Section 8](#)).

The availability of more up to date information from the administrative data sources within the period June 2015 to November 2015 has enhanced the quality assurance process for population estimates for Census Small Areas. Therefore, looking forwards, rather than producing a complete set of population estimates in May/June for all geographies, NISRA is proposing to have two annual releases of population estimates:

- a) Statistical bulletin on population and migration estimates for Northern Ireland, Local Government Districts, Parliamentary Constituencies, Electoral Wards and Super Output Areas in May/June; and
- b) Population estimates for Small Areas and Neighbourhood Renewal Areas in the following October/November.

This will be further discussed at the forthcoming user engagement event in early 2016¹.

3. Population of Northern Ireland

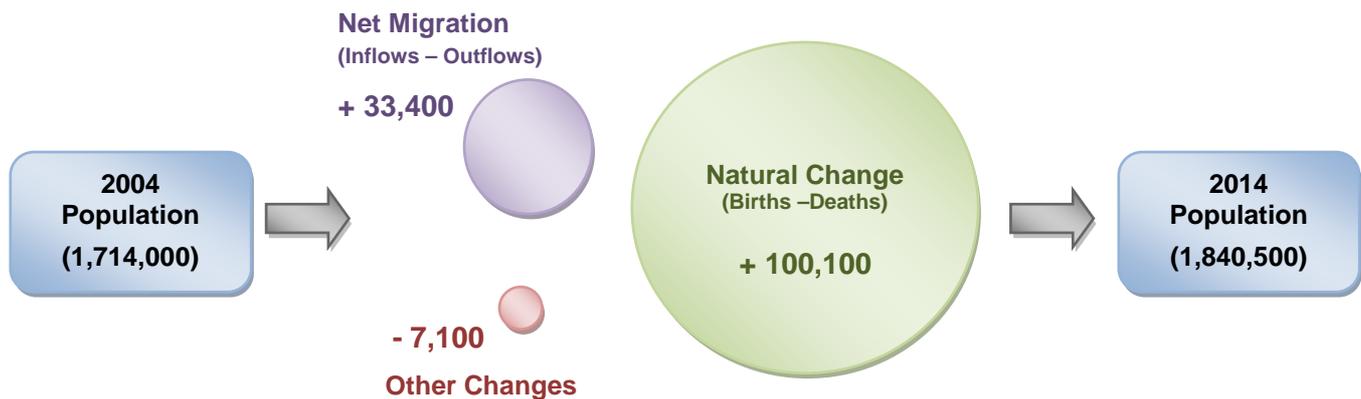
The size of the resident population in Northern Ireland at 30 June 2014 was estimated to be 1.840 million people. Over the period mid-2004 to mid-2014 the number of people living in Northern Ireland is estimated to have increased by 126,500 people (7.4 per cent). This population increase was a result of the following estimated factors:

- a. natural growth of 100,100 people (244,100 births minus 143,900 deaths);
- b. an estimated net growth of 33,400 people due to migration. In total 261,400 people came to live in Northern Ireland and 228,000 people left; and
- c. a net loss of 7,100 due to other changes (principally a reduction in Her Majesty's Forces stationed in Northern Ireland).

Over the last decade, natural growth was the main contributor to the increase in population. Net migration also contributed to the population increase, with the number of people coming to live in Northern Ireland exceeding those leaving Northern Ireland, particularly in the years following the accession of eight Central and Eastern European countries to the EU in 2004.

¹ If you wish to be kept informed of information on this event please contact NISRA using the contact details in the Background Notes.

Figure 1: Contribution of components of change to population increase, mid-2004 to mid-2014



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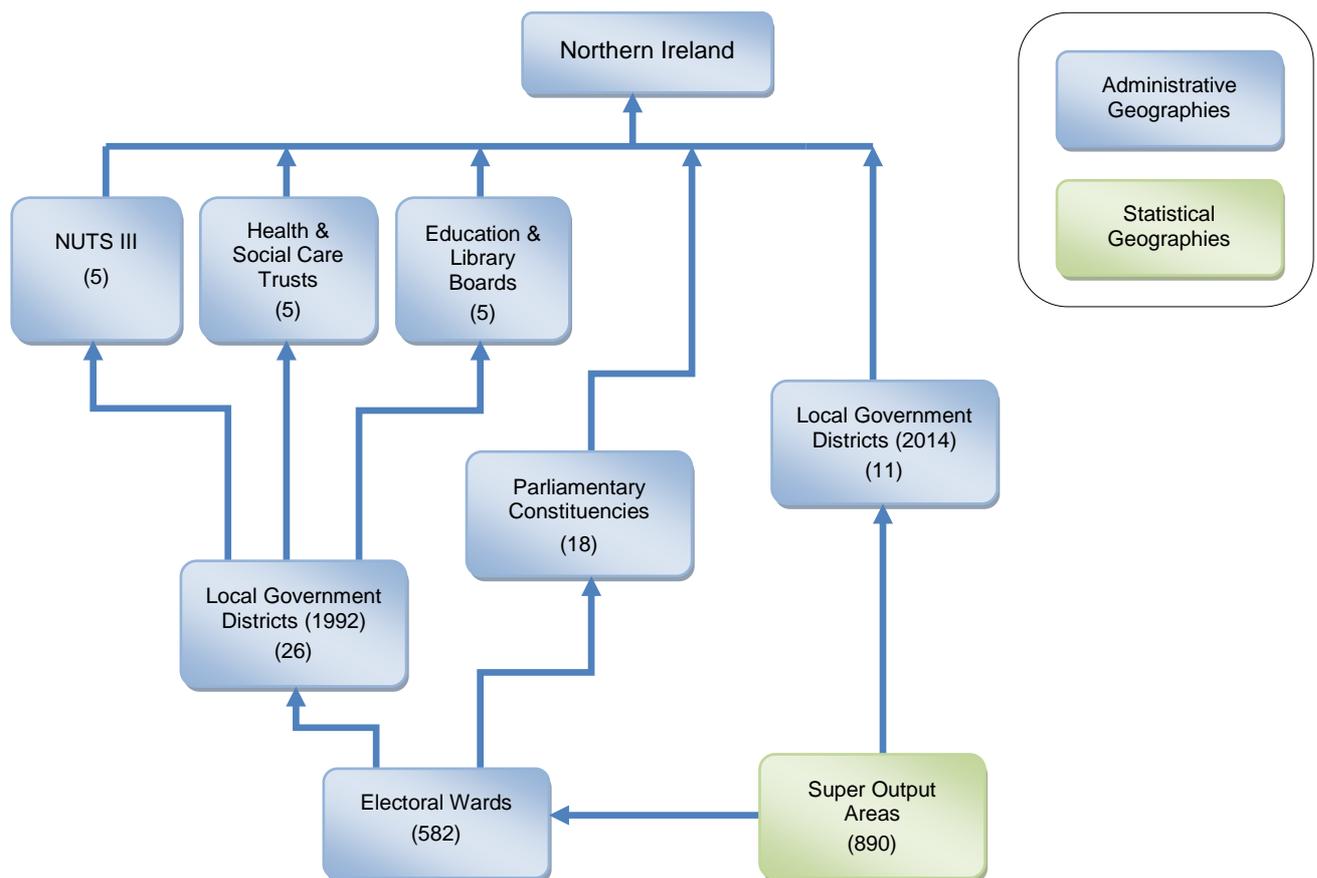
There are regional and local differences within Northern Ireland in the importance of these components of change. For example, the international inward migration was concentrated in areas with employment opportunities. In addition, there is migration within Northern Ireland, driven again by employment opportunities, but also the availability of housing and access to services. Similarly, the reduction in Her Majesty's Forces stationed in Northern Ireland would affect those areas with army barracks. This becomes more important when looking at smaller geographical areas.

4. Population of Super Output Areas

Population estimates for areas within Northern Ireland are created by Super Output Areas, which are whole or subdivisions of electoral wards. These Super Output Areas become the building blocks to create population estimates for most other geographies (see Figure 2). As such, Super Output Areas are the key geography for population estimates.

Super Output Areas were designed to be more uniform than Electoral Wards, both in terms of population size and socio-economic make-up. As the population sizes of Electoral Wards vary, some Super Output Areas are the equivalent of Electoral Wards, while some Electoral Wards are made up of multiple Super Output Areas.

Figure 2: Bottom-Up Approach used in the Population Estimates Methodology



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In mid-2014, the average population per Super Output Area was 2,100 people. The largest population of 5,200 people was in Mallusk_2, an area on the outskirts of the Belfast Metropolitan Area which has seen the addition of housing developments in recent years. Its population nearly doubled (94.4 per cent) in the decade mid-2004 to mid-2014. Table 1 shows the Super Output Areas with a population growth larger than 50 per cent between mid-2004 and mid-2014. New housing developments, particularly on the outskirts of towns and villages within commuter distance from Belfast, have been a main contributor to large population growths over the last decade. This was the case in Derryagh_1 Super Output Area, which had the largest population growth mid-2004 and mid-2014.

The smallest population of 400 people was in Lisanelly_1, the site of an army barrack that closed in early 2007 with a subsequent decline (70.6 per cent) in population (see Table 2).

Table 1: Super Output Areas with a population growth in excess of 50 per cent, mid-2004 to mid-2014

| Super Output Area | Population Estimates | | | Percentage Change | |
|----------------------------|----------------------|-------|-------|-------------------|-----------|
| | 2004 | 2013 | 2014 | 2004-2014 | 2013-2014 |
| Derryaghy_1 | 1,600 | 4,300 | 4,400 | 174.9 | 3.5 |
| Springfarm_1 | 1,400 | 2,900 | 3,000 | 109.8 | 4.5 |
| Mallusk_2 | 2,700 | 5,000 | 5,200 | 94.4 | 4.1 |
| Kilwaughter_1 | 2,200 | 3,800 | 3,900 | 78.8 | 1.8 |
| Enagh_2 (Derry & Strabane) | 2,100 | 3,400 | 3,400 | 65.1 | -0.3 |
| Kernan_2 | 2,200 | 3,500 | 3,600 | 64.1 | 2.2 |
| Legoniel_1 | 2,100 | 3,300 | 3,300 | 61.4 | 1.7 |
| Conlig_1 | 1,700 | 2,600 | 2,700 | 58.8 | 3.1 |
| Waringstown_1 | 1,800 | 2,700 | 2,800 | 58.2 | 4.0 |
| Knockmore_1 | 1,900 | 2,900 | 3,000 | 54.5 | 3.0 |
| Ballymacoss_3 | 2,400 | 3,600 | 3,700 | 54.3 | 3.0 |
| Donaghcloney_2 | 1,700 | 2,500 | 2,600 | 53.7 | 0.7 |
| Conlig_2 | 1,800 | 2,500 | 2,700 | 50.1 | 4.9 |

[Download Table](#) (XLS Format – 1,505 Kb)

Table 2: Super Output Areas with a population decline of more than 20 per cent, mid-2004 to mid-2014

| Super Output Area | Population Estimates | | | Percentage Change | |
|-------------------|----------------------|-------|-------|-------------------|-----------|
| | 2004 | 2013 | 2014 | 2004-2014 | 2013-2014 |
| Lisanelly_1 | 1,300 | 400 | 400 | -70.6 | 1.6 |
| Aldergrove_1 | 2,500 | 1,100 | 1,000 | -58.9 | -2.4 |
| Loughview_2 | 1,500 | 1,300 | 1,000 | -34.8 | -22.4 |
| Killough_2 | 2,000 | 1,900 | 1,400 | -30.8 | -25.7 |
| Wallace Park_1 | 1,800 | 1,000 | 1,300 | -29.1 | 32.7 |
| Ardoyne_1 | 2,200 | 1,700 | 1,700 | -24.3 | -0.7 |
| Ballyloran | 1,300 | 1,000 | 1,000 | -22.5 | -2.4 |
| Ballycolman | 2,200 | 1,800 | 1,700 | -22.0 | -2.3 |
| Magheralave_1 | 1,800 | 1,400 | 1,400 | -20.7 | 5.1 |

[Download Table](#) (XLS Format – 1,505 Kb)

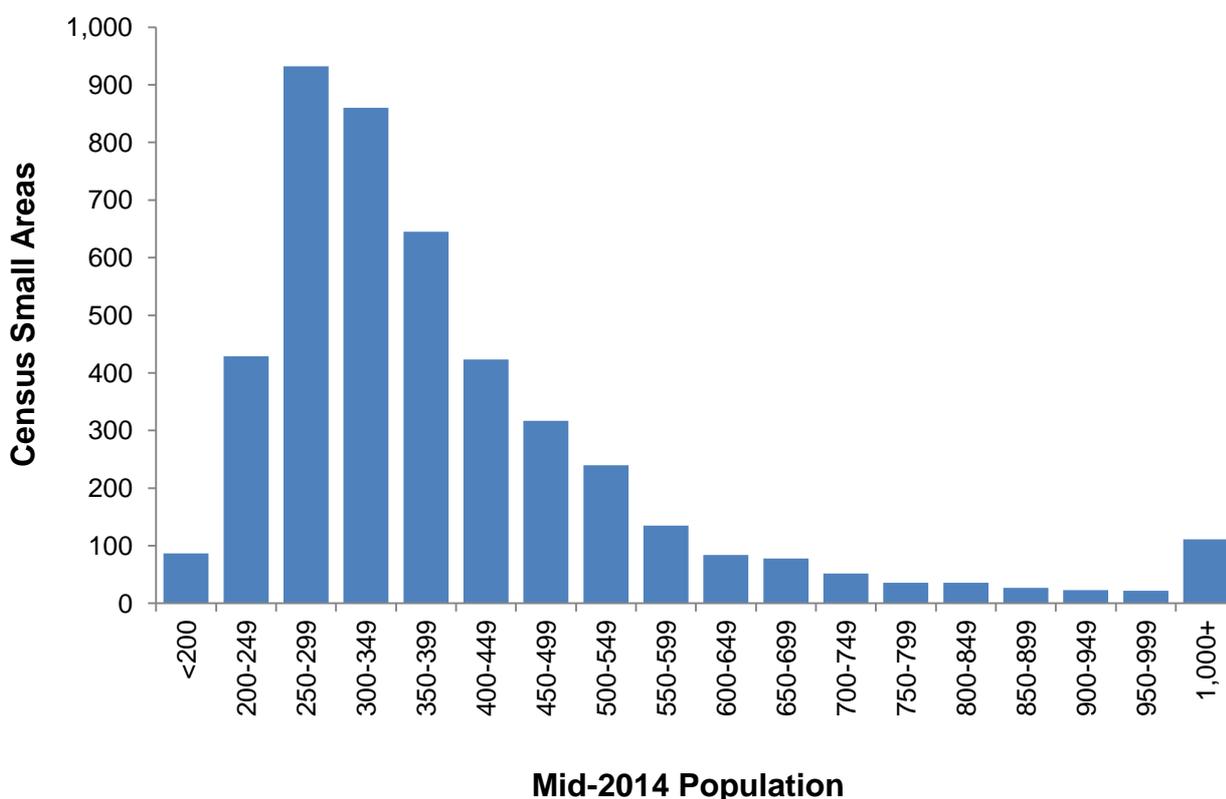
The five Super Output Areas with the largest relative population decline between mid-2004 and mid-2014 have either had a closure or reduced occupation of army barracks. In early 2014, Ballykinlar barracks in Killough_2 (Newry, Mourne & Down Local Government District) closed and staff were assigned to barracks in Wallace Park_1 (Lisburn & Castlereagh Local Government District). Super Output Areas within the 20 per cent most deprived areas were also more likely to experience a declining population.

Super Output Areas continue to be the main geography for describing population change for smaller geographical areas. Users are advised where possible to use Super Output Areas for the production of population estimates for bespoke geographies.

5. Population of Census Small Areas

Super Output Areas are made up from, on average, five Census Small Areas with an average population of 406 people in mid-2014. Figure 3 shows the distribution of Census Small Areas by population size. The vast majority (79.5 per cent) of Census Small Areas have a population between 200 and 500 people. There are two Census Small Areas with a population less than 100 – a quarter of the average population of Census Small Areas in mid-2014 – and 15 Census Small Areas with a population over 1,600 people, which is four times the average population in mid-2014.

Figure 3: Number of Census Small Areas by population, mid-2014



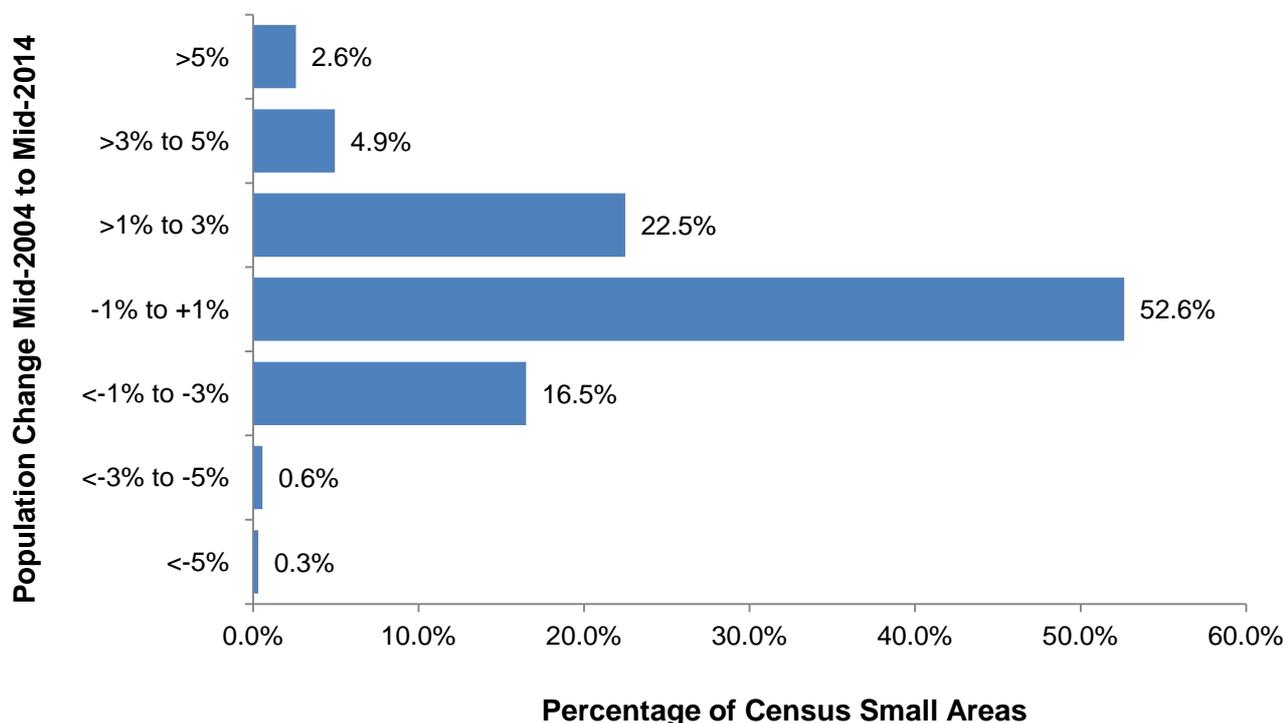
[Download Chart](#) (XLS Format – 1,517 Kb)

The median population size was 347 people, i.e. there is the same number of Census Small Areas with a population below as above this figure. This median population has remained largely unchanged in the last decade, despite a population growth of 7.4 per cent over the period mid-2004 to mid-2014. This suggests that the growth occurs predominantly in those areas that are already in the upper half of population sizes. Equivalent figures for each Local Government District are reported in [Annex A](#).

[Section 4](#) showed Super Output Areas with the greatest population growth or decline. This population change may have occurred either across all of its Census Small Areas or could be concentrated in certain Census Small Areas.

It is more reliable to assess population change for smaller geographical areas over a longer period. The year-on-year changes can be exaggerated by new housing developments, the opening and closure of large communal residences, and improvements in the spatial allocation. Figure 4 shows that the population size of over half (52.6 per cent) of Census Small Areas changed by less than on average one per cent annually between mid-2004 and mid-2014, whilst 2.9 per cent of Census Small Areas changed by more than five per cent annually.

Figure 4: Distribution of Census Small Areas by average annual population change, mid-2004 to mid-2014



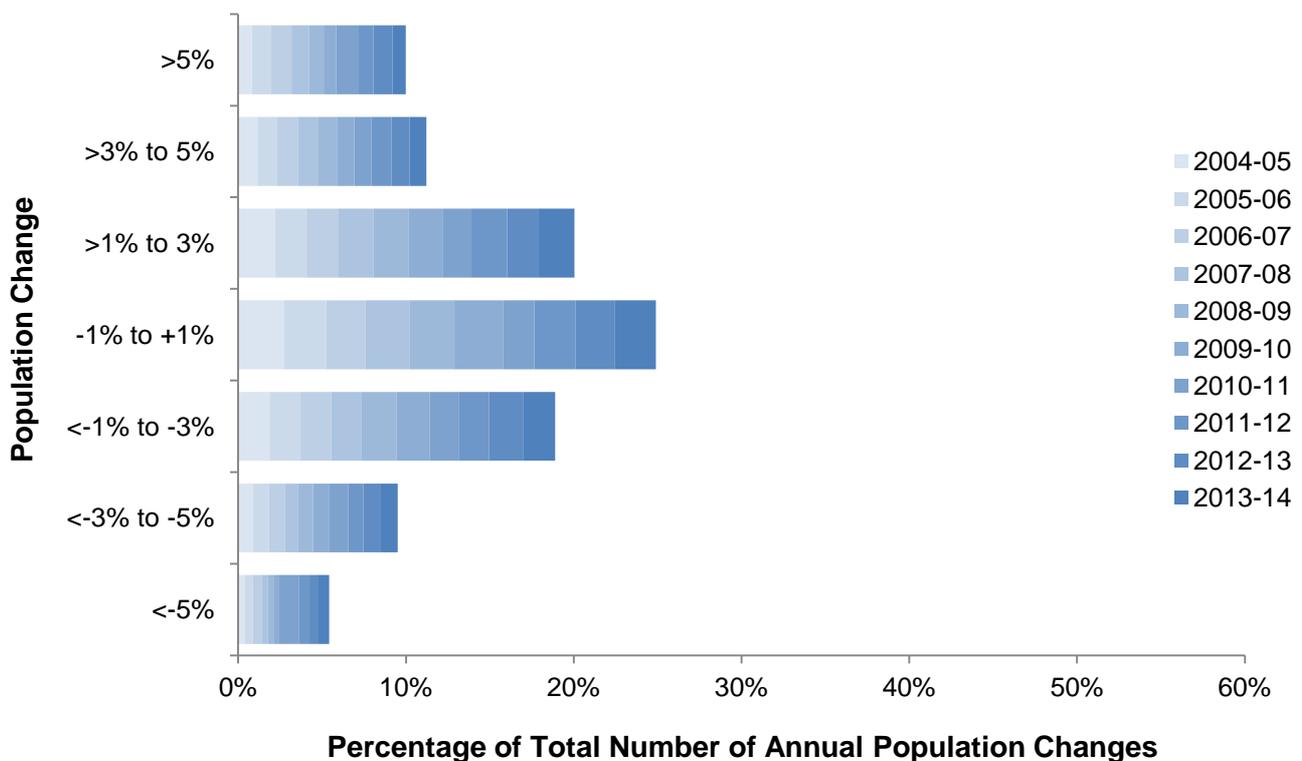
[Download Chart](#) (XLS Format – 1,516 Kb)

Analysis has been undertaken on the annual changes in population of the 4,537 Census Small Areas over the 10 year period mid-2004 to mid-2014, i.e. 45,370 changes (10 years * 4,537 Census Small Areas). Figure 5 shows the distribution of these changes; between mid-2004 and mid-2014, a population change in excess of five per cent was estimated for 15.4 per cent of these changes. In fact, over two thirds (68.1 per cent) of Census Small Areas had at least one annual change in excess of five per cent.

This demonstrates the variability of the population for Census Small Areas; caution should be taken when interpreting annual population changes, which should be regarded within a long-term trend. This is particularly true for relatively large population decline. There are 1,676

Census Small Areas where at least one annual estimated population change was a fall of more than five per cent in the period between mid-2004 and mid-2014. This is more than a hundred-fold of the number of Census Small Areas (14) that had an average annual population decline of more than five per cent over the whole ten year period. Indeed, nearly one third (31.6 per cent) of these 1,676 Census Small Areas experiences average population growth over this period.

Figure 5: Distribution of annual population changes for each Census Small Area, mid-2004 to mid-2014



[Download Chart](#) (XLS Format – 1,529 Kb)

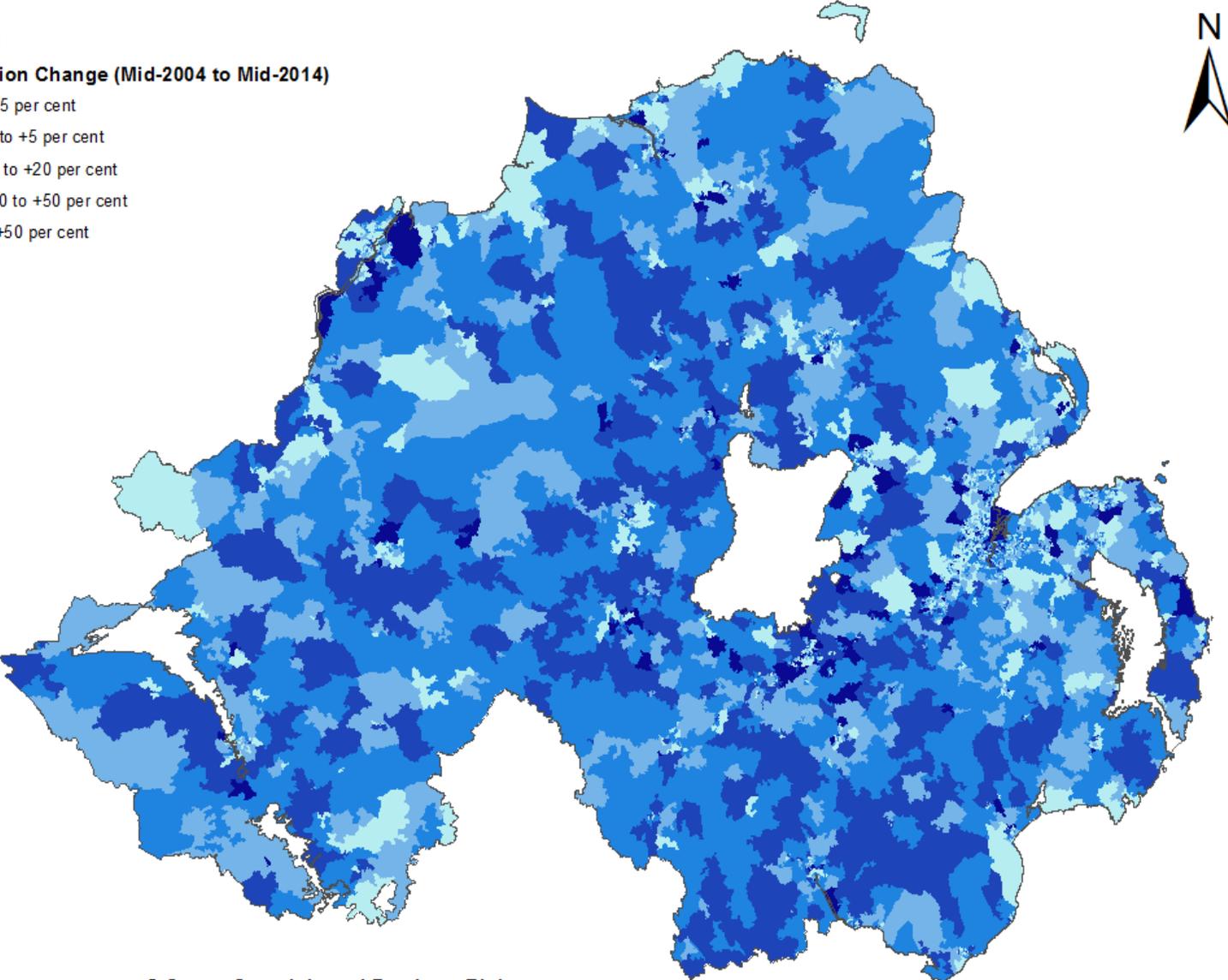
Map 1 shows the relative population change by Census Small Area for this period. Table 3 shows Census Small Areas where the population doubled between mid-2004 and mid-2014. This cut-off is twice the size of population change reported by Super Output Areas in Table 1. Census Small Areas that lie within the Super Output Areas with the largest population increase have been highlighted.

Map 1: Relative population change by Census Small Area, mid-2004 to mid-2014

SA2011

Population Change (Mid-2004 to Mid-2014)

- < -5 per cent
- 5 to +5 per cent
- +5 to +20 per cent
- +20 to +50 per cent
- > +50 per cent



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[Download Map](#) (PDF Format – 69 Kb)

**Table 3: Census Small Areas where population more than doubled
between mid-2004 and mid-2014**

| Census Small Area | Super Output Area | Population Estimates | | Population change (2004-14) |
|-------------------|-------------------|----------------------|----------|-----------------------------|
| | | Mid-2004 | Mid-2014 | |
| N00004091 | Rostulla_2 | 300 | 900 | 245% |
| N00000098 | Springfarm_1 | 400 | 1,500 | 236% |
| N00003308 | Derryaghy_1 | 1,100 | 3,700 | 235% |
| N00004059 | Mallusk_2 | 600 | 2,000 | 231% |
| N00003145 | Kilwaughter_1 | 400 | 1,400 | 217% |
| N00003407 | Knockmore_1 | 200 | 700 | 186% |
| N00001131 | Duncairn_1 | 400 | 1,100 | 183% |
| N00000074 | Massereene_2 | 400 | 1,200 | 180% |
| N00001155 | Falls_3 | 300 | 700 | 168% |
| N00001401 | Rosetta_1 | 300 | 800 | 164% |
| N00002378 | Waringstown_1 | 300 | 900 | 159% |
| N00004211 | Conlig_1 | 300 | 800 | 158% |
| N00003276 | Ballymacoss_2 | 300 | 700 | 153% |
| N00003280 | Ballymacoss_3 | 400 | 1,000 | 151% |
| N00003349 | Glenavy_1 | 400 | 1,100 | 149% |
| N00002305 | Kernan_2 | 300 | 900 | 148% |
| N00001505 | The Mount_1 | 200 | 500 | 141% |
| N00001029 | Botanic_5 | 300 | 700 | 139% |
| N00003271 | Ballymacoss_1 | 300 | 700 | 134% |
| N00001093 | Cliftonville_1 | 300 | 800 | 132% |
| N00001396 | Ravenhill_3 | 300 | 600 | 124% |
| N00001780 | Carrowreagh_1 | 400 | 800 | 122% |
| N00001203 | Glen Road_1 | 300 | 700 | 121% |
| N00000009 | Aldergrove_3 | 300 | 700 | 121% |
| N00004359 | Coolnagard | 500 | 1,100 | 121% |
| N00000097 | Springfarm_1 | 400 | 900 | 115% |
| N00002319 | Knocknashane_1 | 300 | 700 | 114% |
| N00001246 | Highfield_1 | 300 | 600 | 112% |
| N00002277 | Drumgor_2 | 300 | 600 | 112% |
| N00001312 | Legoniel_1 | 300 | 700 | 111% |
| N00001570 | Whiterock_2 | 500 | 1,100 | 111% |
| N00002351 | Parklake | 700 | 1,500 | 110% |
| N00002626 | Victoria | 400 | 900 | 109% |
| N00004060 | Mallusk_2 | 600 | 1,300 | 108% |
| N00002353 | Taghnevan | 1,000 | 2,000 | 107% |
| N00000158 | Ballywalter_2 | 300 | 700 | 105% |
| N00003147 | Kilwaughter_1 | 600 | 1,200 | 104% |
| N00002261 | Donaghcloney_2 | 400 | 800 | 103% |
| N00001310 | Legoniel_1 | 500 | 1,000 | 102% |
| N00001163 | Falls Park_2 | 200 | 400 | 101% |

* Note: Highlighted Census Small Areas lie within Super Output Areas whose population increased by more than 50 per cent between mid-2004 and mid-2014

[Download Table](#) (XLS Format – 1,509 Kb)

The largest population growth (245 per cent) occurred in a Census Small Area within Rostulla_2 Super Output Area, which itself grew by 25.1 per cent over the period mid-2004 to mid-2014. This growth can be mainly attributed to new communal accommodation in this Census Small Area, housing 600 students according to the 2011 Census. This is followed by five Census Small Areas that lie within Super Output Areas that experienced a population growth in excess of 50 per cent (see Table 1). Note that four Super Output Areas have two Census Small Areas each where the population more than doubled between mid-2004 to mid-2014: Kilwaughter_1, Legoniel_1, Mallusk_2 and Springfarm_1.

Out of the 40 Census Small Areas with a population growth in excess of 100 per cent, 15 lay within the 13 Super Output Areas with a growth in excess of 50 per cent presented in Table 1. These 13 Super Output Areas are made up from 54 Census Small Areas in total, of which two experienced a population decline and a further six population growth below the Northern Ireland average.

There were only two Super Output Areas (Derryaghy_1 and Mallusk_2) where each constituent Census Small Area experienced a population growth in excess of 20 per cent. This shows that there are small pockets of high levels of population growth, often associated with new housing developments.

Table 4 shows 14 Census Small Areas where population fell in excess of 40 per cent between mid-2004 and mid-2014. This cut-off is twice the size of population changes reported by Super Output Areas in Table 2.

Table 4: Census Small Areas where population fell by more than 40 per cent between mid-2004 and mid-2014

| Census Small Area | Super Output Area | Population Estimates | | Population change (2004-14) |
|-------------------|-------------------|----------------------|----------|-----------------------------|
| | | Mid-2004 | Mid-2014 | |
| N00004413 | Lisanelly_1 | 1,000 | 200 | -79% |
| N00000976 | Blackstaff_1 | 300 | 100 | -60% |
| N00000001 | Aldergrove_1 | 2,500 | 1,000 | -59% |
| N00001008 | Botanic_1 | 600 | 200 | -58% |
| N00000988 | Blackstaff_2 | 200 | 100 | -57% |
| N00003081 | Ballyloran | 200 | 100 | -54% |
| N00003481 | Moira_2 | 400 | 200 | -52% |
| N00003456 | Magheralave_1 | 500 | 200 | -50% |
| N00004294 | Loughview_2 | 1,000 | 500 | -49% |
| N00003107 | Central_1 | 400 | 200 | -42% |
| N00004414 | Lisanelly_1 | 300 | 200 | -42% |
| N00000927 | Beechmount_1 | 600 | 400 | -41% |
| N00001361 | New Lodge_3 | 300 | 200 | -41% |
| N00002726 | Killough_2 | 1,600 | 1,000 | -40% |

* Note: Highlighted Census Small Areas lie within Super Output Areas whose population decreased by more than 40 per cent between mid-2004 and mid-2014

[Download Table](#) (XLS Format – 1,507 Kb)

There were eight Census Small Areas where the population more than halved in this period. Again, Census Small Areas that lie within the Super Output Areas with the largest population decrease have been highlighted. Lisanelly_1 Super Output Area is represented by both of its Census Small Areas, one of which has the largest population decline between mid-2004 and mid-2014. This is linked to the closure of army barracks in early 2007. The reduced presence of armed forces is also evident in Aldergrove_1, Loughview_2 and Killough_2. Table 4 also includes five Census Small Areas in Belfast Local Government District. The population decline in these areas may be associated with urban regeneration.

6. Methodology

Population estimates at the Northern Ireland level are derived using the cohort-component method, which updates the latest Census estimates by 'ageing on' populations and adjusting for births, deaths and migration. Population estimates for areas within Northern Ireland are created by aggregating estimates of Super Output Areas, which are created from a combination of the cohort component method and the ratio change method, and constrained to the Northern Ireland estimates.

In the Ratio Change method, selected indicators of population change are used to update the population from some earlier or base period. The Ratio Change method assumes an unchanged relationship over time between the chosen indicator and the true population. For example, if the chosen indicator increases by five per cent over the period for which estimates are required, the base population is also increased by five per cent. As the Cohort Component method and the Ratio Change method are both equally robust, and each has separate advantages and disadvantages, the average of both methods is taken for the final figures.

The methodology used for areas within Northern Ireland does not perform well for Census Small Areas, particularly the ratio change method. Firstly, not all data sources are available at this level. Second, small counts can result in large relative changes. Finally, there is more room for error in the geo-spatial referencing of input data.

Population estimates of Super Output Areas are therefore broken down to Census Small Area level using the apportionment method. This method is also used by the Office of National Statistics for creating population estimates for Output Areas from Lower Layer Super Output Area population estimates in England and Wales (see Section 4.2 of [Methodology Paper](#)). 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. Inherent in this method is the assumption that the relationship between the indicator of the population and the true population is the same for each smaller area within the (larger) reference area. For Northern Ireland, the reference areas are Super Output Areas, which by design are relatively homogenous.

The indicators used for this method were, on one hand, the Census Small Area level estimates from the components of change method, and on the other, a combination of sources used in the ratio change method:

- Medical Card Register;
- School Census (for those aged 5 to 15 only); and
- State Pension and related benefits (for those aged 65 and over only).

These indicators did not sufficiently prevent the estimates to drift from 2011 Census estimates towards counts from administrative data sources post-2011, which lead to the postponement of population estimates for Census Small Areas after the mid-2012 release.

Under a revised approach, the list of administrative data sources was augmented with counts of armed forces, Higher Education Statistics, and 2011 Communal Residents counts for Super Output Areas that contain barracks, high concentration of students, and communal establishments such as nursing homes respectively. All sources have been given equal weight in the calculation of proportions, see equation below:

$$POP_{SA} = average \left(\frac{CC_{SA}}{CC_{SOA}}; \frac{MC_{SA} + SC_{SA} + SP_{SA} + AF_{SA} + HE_{SA} + CR_{SA}}{MC_{SOA} + SC_{SOA} + SP_{SOA} + AF_{SOA} + HE_{SOA} + CR_{SOA}} \right) \times POP_{soa}$$

where *POP* is the population estimate, *CC* is the estimates from the components of change method, *MC* is the medical card register, *SC* is the School Census, *SP* is the State Pension and related benefits, *AF* is armed forces, *HE* is higher education students and *CR* is communal residents. The subscripts *SA* and *SOA* are used for Census Small Areas and Super Output Areas respectively. Note that for those aged under two years, only the components of change based estimates are used due to a lag in registration on the medical card register.

The initial results for Census Small Areas were constrained to be consistent to estimates for Super Output Areas and larger geographical areas within Northern Ireland. This was followed by a quality assurance exercise, in which the initial results were compared to counts from the School Census, Pension and related benefits, and Medical Card Register. The focus lay on those estimates with a considerable change since the 2011 Census, or where estimates were markedly different from the administrative data sources, or indeed differences between data sources. Additional information from subsequent and previous years, including the 2011 Census, and recent aerial photography, was used to form a consensus on the best approximation of its population.

For less than 0.5 per cent of Census Small Areas in each year, it was found that the initial results from the apportionment method were not accurately representative of the administrative data sources, or more commonly, certain sources (in certain years) were flawed as an indicator of Census Small Area population. Adjustments were made to population estimates of these Census Small Areas, often for specific age groups only, before constraining to Super Output Area level population estimates.

7. Data Quality

Population estimates for Census Small Areas are fraught by difficulties due to a combination of their small population (400 people on average) and small geographical area. This section will discuss the quality of used data sources, particular issues relating to small geographical areas, and National Statistics.

Quality of Data Sources

Sources used in the production of official statistics by NISRA are reported in the [Statement of Administrative Sources](#). For each source, it stipulates the statistical products for which it is used, and arrangements for auditing the data quality.

The [quality report](#) accompanying the population estimates published in June 2015 provides a detailed discussion of the quality of the following data sources:

- 2011 Census;
- Birth and death registrations;
- Medical Card Register;
- School Census;
- Child Benefit; and
- Pension and related benefits.

Higher Education Statistics Agency ([HESA](#)) data is used to account for students who move from the parental home to their place of study, which have not been captured by the medical card register. Data is available by single year of age, sex, home address and term-time address. The data quality assurance processes are described [here](#). Further checks are carried out by NISRA, particularly on the term-time address. Predominantly, first-year students may not know the postcode of their term-time address, or would enter the postcode of the university's student administration. Such geo-spatial issues are resolved by spreading these records over university specific students' areas.

The number of armed forces stationed in Northern Ireland – broken down by Local Government District, single year of age and sex – is provided by the Defence Analytical Services and Advice (DASA) within the Ministry of Defence. A Background Quality Report on this dataset can be found [here](#). 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 Local Government Districts 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 Census Small Area boundary it is located. This method was used in the 2011 Census, birth and death registrations, and the medical card register.

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'). In other words, the occupants of all properties with an identical postcode will be allocated to the same geographical area. This method is used for data from the School Census, Higher Education Statistics Agency, and Pensions and related benefits.

There may still be a small number of cases where the address quality is insufficient to determine the exact location, or with a missing postcode. Such records are spread over multiple Census Small Areas – allocating a fraction of a person – based on additional information, such as the catchment areas of Schools, GP practices, or the postcode sector (first four characters).

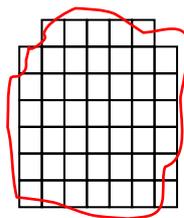
The Central Postcode Directory becomes less accurate when looking at smaller geographical areas. There are around 42,000 postcodes in Northern Ireland, therefore on average 9 postcodes per Census Small Area and 47 postcodes per Super Output Area. Boundaries of statistical geographies are not necessarily aligned with those of postcodes. Figure 6 below demonstrates how for larger areas a greater proportion of postcodes (black squares) are wholly within the area boundary (red line), and the difference with the exact boundary is smaller as a proportion of the whole area.

Figure 6: Approximation of Census Small Areas and Super Output Areas by postcodes

Small Area



Super Output Area



As a rough guide, the postcode lookup for Census Small Areas is accurate within 15 per cent, and for Super Output Areas within 5 per cent. The population estimates for Census Small Areas use a combination of data sources, with those relying on postcode data in the minority. Further guidance on the quality of the Central Postcode Directory is available [here](#).

National Statistics

National Statistics are produced to high professional standards set out in the Code of Practice for Official Statistics. They undergo regular quality assurance review to ensure they meet customer needs. They are produced free from any political interference. The United Kingdom Statistics Authority has [designated](#) these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs;
- are well explained and readily accessible;
- are produced according to sound methods; and
- are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

In July 2015, the UK Statistics Authority published a report on the Assessment of compliance with the Code of Practice for Official Statistics for Population Estimates and Projections for Northern Ireland ([Assessment Report 312](#)). The UK Statistics Authority confirms that the population statistics for Northern Ireland – including “Population Estimates for Small Areas” – are designated as National Statistics, subject to NISRA implementing six specific requirements. Since then, an [action plan](#) was published, outlining how and when NISRA will address the requirements and six further suggestions.

8. Impact of revision – 2012 population estimates

Population estimates for Census 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 Census Small Areas within a Super Output Area occurred. Therefore, it was decided to revise the Census Small Area estimates only, and constrain to the unchanging published Super Output Area estimates. This meant that some Census Small Areas experienced a minor revision to meet this constraint.

Table 5 shows the counts of Census Small Areas by the level of revision of 2012 population estimates. The vast majority of Census Small Areas (88.7 per cent) remain unchanged. Census Small Areas with a minor population change are those affected by constraining to the Super Output Areas population. Of the 435 Census Small Areas that changed by less than one per cent, 401 Small Areas (92.2 per cent) changed by only one person.

Table 5: Counts of Census Small Areas by level of revision 2012 population estimates

| Level of revision | Census Small Area | |
|---------------------------|-------------------|------------|
| | Count | Proportion |
| No change | 4,024 | 88.7% |
| Less than 1 per cent | 435 | 9.6% |
| Between 1 and 3 per cent | 52 | 1.1% |
| Between 3 and 5 per cent | 6 | 0.1% |
| Between 5 and 10 per cent | 13 | 0.3% |
| More than 10 per cent | 7 | 0.2% |

[Download Table](#) (XLS Format – 1,505 Kb)

In the forthcoming user engagement event, it will be proposed to release Census Small Area level estimates in October/November following the mid-year population estimates. In the current release, Census Small Area estimates for mid-2014 benefited from the availability of medical card counts for mid-2015 to assess whether a sudden or large population change between mid-2013 and mid-2014 is sustained.

9. Comparison of small area population estimates across the UK

Population estimates for the [Scottish 2011 data zones](#) were released by National Records Scotland in August 2015, based on the component of change method. The average population of the 2011 data zones is 800 people; estimates are broken down by sex and roughly five-year age bands.

Population estimates for Lower and Middle Layer Super Output Areas (LSOAs and MSOAs) in [England and Wales](#) were published on 25 November 2015, based on the ratio change method. The average population of LSOAs and MSOAs are 1,700 and 8,000 respectively. LSOA level populations can be disaggregated into 5 age groups, MSOAs in roughly five-year age bands.

The Northern Ireland Super Output Areas are most comparable to the LSOAs in terms of size and level of detail. Their methodology is a mixture of component of change (used for Scotland) and ratio change (used for England and Wales).

The average population of Census Small Areas (400 people) is roughly half the size of the Scottish Data Zones, and a quarter of the size of LSOAs in England and Wales. This average size is an important factor in the comparability of Small Area Population Estimates, as smaller areas will have more extreme population growth or decline, as is evident from comparing Census Small Areas and Super Output Areas within Northern Ireland.

The LSOAs in England and Wales can be further broken down into 181,408 Output Areas, which have an average population of 300 people. Output Area level population estimates by sex and single year of age are made available as supporting information to provide users with 'building bricks' for producing best-fit population estimates for higher levels of geography, and to allow the creation of population estimates for bespoke age groups. Direct use of these estimates is not recommended as the estimates cannot be guaranteed to be accurate at this level of detail. A similar warning can be given about the use of the population estimates for Census Small Areas in Northern Ireland.

A detailed comparison paper of small area population estimates produced around the UK is available at:

http://www.nisra.gov.uk/archive/demography/population/small_area/SAPE14-comparison.pdf

10. Limitations and User Guidance

Population estimates for Census Small Areas are created to address users' needs for more detailed information. Throughout this report, some words of caution have been raised when interpreting these findings, for example, to look at the longer time trend rather than year-on-year changes, and to be aware of the issues in geo-spatial allocation.

There is a particular difficulty in estimating the population of Census 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 that 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. The 2011 Census can be used to locate areas with large numbers of [students](#), but also to identify other areas with high population turnover or churn, for example those with a large proportion of [rented accommodation](#), or a large proportion of the population [born outside the UK or Ireland](#).

Information from the 2011 Census can also be used to identify Census Small Areas with large [communal populations](#). These can also be broken down by [communal type](#), to distinguish between medical and care establishments, education establishments (students' halls of residence), defence establishments and prisons. The 2011 Census is still sufficiently recent to identify such areas, but it does not exclude the possibility of new establishments being build and current establishments being closed. Users should take particular care when using the population estimates in those areas.

Population estimates for Census Small Areas do not provide a breakdown by age and sex, as a further disaggregation of these estimates will have greater confidence intervals. The [2011 Census](#) population estimates does provide such breakdown by sex and single year of age up to age 99, and for those aged 100 and over as one group. In other words, the total population of 1.81 million people can be split over 916,474 combinations² of Census Small Area, sex and single year of age. More than half of these combinations (51.5 per cent) have a population estimate of either zero or one. One cannot assume that the age distribution within a Census Small Area has remained unchanged since the 2011 Census: at the very least, everybody got a year older.

NISRA
November 2015

² This is the combination of 4,537 Small Areas, 2 sexes (male and female), and 101 ages (0,1,2, ..., 99 and 100+)

Background Notes

1. The Northern Ireland mid-year population and migration estimates are produced by the Northern Ireland Statistics and Research Agency (NISRA). The population estimates refer to the number of people in the population at 30 June each year, the statistics are therefore often referred to as the mid-year estimates. Population statistics relate to the usually resident population of Northern Ireland including Her Majesty's Forces stationed here.
2. Further information on population estimates for Census Small Areas can be found on the [NISRA website](#).
3. Further information on the methodology is available in the population and migration estimates [Methodology Report](#).
4. Interactive content on population, along with further statistics, are available on [NINIS](#).
5. Equivalent figures for [England and Wales](#) are also published today by the Office for National Statistics (ONS). Small Area Population estimates (2014) for the 2011 Data zones in [Scotland](#) were published by National Records Scotland (NRS) on 27 August 2015. Population estimates for areas smaller than the eight Regional Authority Areas in the [Republic of Ireland](#) are only available from Census information (most recently for 2011) released by the Central Statistics Office (CSO).
6. The revisions policy for Northern Ireland population statistics is available [here](#).
7. We welcome feedback from users on the content, format and relevance of this release. Please complete a short [survey](#) or send feedback directly to census.nisra@dfpni.gov.uk.
8. Follow NISRA on [Twitter](#) and [Facebook](#).
9. All media inquiries should be directed to the DFP Communications Office:
Telephone: 028 9081 6724
10. Further statistical information can be obtained from NISRA Customer Services:
Telephone: 028 9034 8160
Fax: 028 9034 8161
E-mail: census.nisra@dfpni.gov.uk
Responsible Statistician: Brian Green

Annex A: Summary results by Local Government District

| Local Government Districts | | Small Area Population Estimates, mid-2014 | | | | | | |
|-------------------------------|-----------------------|---|--------------------|--------------------|--------------------|-------------------|----------------|----------------|
| Name | Number of Small Areas | Total population | Minimum population | Maximum population | Average population | Median population | Lower quartile | Upper quartile |
| Antrim & Newtownabbey | 352 | 140,000 | 155 | 1,952 | 398 | 322 | 277 | 414 |
| Armagh, Banbridge & Craigavon | 467 | 205,700 | 165 | 2,071 | 440 | 395 | 295 | 491 |
| Belfast | 951 | 336,800 | 92 | 3,672 | 354 | 304 | 263 | 365 |
| Causeway Coast & Glens | 342 | 142,300 | 168 | 1,529 | 416 | 363 | 287 | 473 |
| Derry & Strabane | 328 | 149,200 | 133 | 2,054 | 455 | 355 | 298 | 461 |
| Fermanagh & Omagh | 263 | 115,000 | 147 | 1,486 | 437 | 404 | 327 | 491 |
| Lisburn & Castlereagh | 345 | 138,600 | 171 | 2,417 | 402 | 339 | 288 | 421 |
| Mid & East Antrim | 369 | 136,600 | 114 | 1,387 | 370 | 329 | 276 | 417 |
| Mid Ulster | 294 | 142,900 | 212 | 1,903 | 486 | 453 | 364 | 543 |
| Newry, Mourne & Down | 385 | 175,400 | 179 | 1,929 | 456 | 414 | 344 | 517 |
| North Down & Ards | 441 | 157,900 | 93 | 2,317 | 358 | 323 | 280 | 387 |
| NORTHERN IRELAND | 4,537 | 1,840,500 | 92 | 3,672 | 406 | 347 | 286 | 453 |

[Download Table](#) (XLS Format – 1,512 Kb)