Northern Ireland Census 2011

Population and Household Estimates for Northern Ireland

Quality Assurance Report

11:00am – Monday, 16 July 2012

Contents

1   Introduction

1.1   The 2011 Census in Northern Ireland was conducted on 27 March 2011, in line with arrangements across the rest of the UK. All of the planning, development, testing and operational aspects for the Census were underpinned by the following high-level strategic aims:

- to provide high quality, value for money statistics that are fit for purpose and meet the needs of users;

- to maximise response rates by actively encouraging public participation in the Census and raising awareness of its important role;

- to protect, and be seen to protect, the confidential personal information collected through the Census; and

- to secure public and user confidence in the final results and deliver them in a timely manner.

1.2   The Population Estimates by Age and Sex for Northern Ireland, released on 16 July 2012, represent the first of a number of results to be published from the 2011 Census. In keeping with the high-level strategic aims outlined above, the purpose of this paper is to provide an overview of the Quality Assurance work that was undertaken by the Northern Ireland Statistics and Research Agency (NISRA) in order to ensure that the Northern Ireland Census population estimates are of a high quality, fit for purpose and meet the needs of users

1.3   Supporting detail on the Quality Assurance work can be found in the NISRA paper Quality Assurance of the 2011 Census in Northern Ireland, which was published in May 2012.

1.4   The numbers presented in this report may not sum to the total as all figures have been rounded to the nearest 100. Similarly, percentages have been quoted to the nearest whole number and, as such, may not sum to 100.

2   Background

2.1   The [Methodology Overview for the First Release](#) provides a synopsis of the key 2011 Census processes that were deployed in Northern Ireland. From the outset, NISRA recognised the importance of considering the overall Census design along with the key operational aspects from a quality perspective (e.g. address register development, field work, assistance to the general public, publicity and advertising, data capture and processing, etc). This resulted in a number of specific quality orientated initiatives being introduced, which are summarised in Annex 1.

2.2   One of the primary aims of the Census is to estimate the number of people who live in Northern Ireland (i.e. the number of usual residents) along with the number of occupied households. While every household and individual in Northern Ireland was legally obligated to participate in the Census, it was anticipated, as in previous Censuses, that some would be missed resulting in under-enumeration.

2.3   Accordingly, NISRA's under-enumeration project was designed and developed to ensure that the Census estimates would be representative of the entire usually resident population in Northern Ireland. This comprised of two key components, namely,

- using high quality administrative data from the list of people registered with a GP practice (the Medical Card Register) in conjunction with information provided by the Census Field Staff to identify, for all non-responding households, (i) if a census questionnaire should have been returned for a particular address (i.e. was there robust evidence of occupancy) and, that being the case, (ii) the key demographic characteristics (e.g. age and sex) of those living at that address. This new approach for 2011 was developed and piloted through both the 2007 Census Test and 2009 Census Rehearsal. In addition, the distribution of key demographic details from a random sample of some 30,000 actual Census returns was compared to that derived on the basis of the details recorded on the Medical Card Register for the same addresses and it was found that the distribution from

the Census returns could be replicated with a high degree of precision. It is considered that this component of the under-enumeration methodology enhanced the coverage assessment and adjustment process in Northern Ireland and has improved the overall reliability and quality of the population estimates.

- The re-enumeration of a specifically targeted stratified random sample of some 14,000 addresses across Northern Ireland, through a Census Coverage Survey, with the aim of estimating the key demographic characteristics of those who had been missed by the Census.

2.4   The number of occupied households in Northern Ireland was estimated at 703,300 with an associated 95 per cent confidence interval[1] of +/- 2,800. Just under 94 per cent of these (659,200) responded to the Census by returning an adequately completed questionnaire. The key demographic characteristics for a further 4 per cent of occupied households (31,000) were captured through the high quality administrative data from the Medical Card Register mentioned above, with the remaining 2 per cent (13,000) being derived through the Census coverage assessment and adjustment process.

2.5   Similarly, the usually resident population of Northern Ireland was estimated at 1,810,900 with an associated 95 per cent confidence interval[1] of +/- 11,000. Just under 92 per cent of usual residents (1,658,300) were included on an adequately completed questionnaire. The key demographic characteristics for a further 4 per cent of usual residents (67,700) were captured through the high quality administrative data from the Medical Card Register mentioned above, with the remaining 5 per cent (84,900) being derived through the Census coverage assessment and adjustment process.

2.6   The average household size (i.e. the total number of usual residents divided by the total number of households with at least one usual resident) was derived as 2.54.

---

[1] Additional Confidence Intervals by age band and sex are presented in Annex 2

3   Overview of the Quality Assurance work undertaken in support of this release

3.1   The primary focus of the Quality Assurance work that was undertaken in support of this release was to compare the 2011 Census population estimates with a variety of appropriate comparator datasets in order to ensure that the estimates were plausible. Detailed metadata on each of the comparator datasets that were used can be found in Annex 2 of the Quality Assurance of the 2011 Census in Northern Ireland document. The comparisons were undertaken at both Northern Ireland level and Local Government District level and included an examination of:-

- Households with usual residents in terms of the overall number, the distribution by household size and the average household size;

- The number of usual residents living in households, communal establishments and in each of the main population sub-groups (e.g. children, working age, pension age, students);

- The distribution of usual residents by age and sex;

- The inferred sex ratio distribution for usual residents by age (i.e. the number of males per 100 females); and

- The inferred fertility and mortality rates for usual residents when these are calculated using the 2011 Census population estimates.

4 Benchmarking the Census Estimates

4.1 Information on the number of births in the year prior to the Census coupled with School Census and Child Benefit data, all of which provide comprehensive coverage of the number of children, was particularly helpful in benchmarking the Census estimates for those in the younger age groups (i.e. those aged 0-14 years). Similarly, information on those in receipt of a pension and/or an age related benefit (e.g. winter fuel payment, bereavement benefit) was particularly helpful in benchmarking the estimates for those in the older age groups (i.e. those aged 65 years and over).

4.2 The extent of the alignment between the Census estimates and the comparator data used for these two particular population sub-groups, which tend to be less mobile from a residency perspective and more accurately reflected in the relevant underlying administrative systems, played an important role in the calibration of the Census estimates more generally.

4.3 While it is generally the case that administrative systems are unable to capture those in the young adult range just as effectively due to their more mobile and flexible lifestyles, activities recorded on the Medical Card Register regarding the collection of a prescription, changes to registration details and treatment by a dentist or optician in the two year period prior to the Census were considered to provide good evidence of residence. This information along with information derived from NISRA's mid-year population estimates series (appropriately adjusted to represent Census Day) was used in the benchmarking of the 2011 Census estimates across all age groups.

5 Illustrative Quality Assurance Charts

5.1 Figure 1 below shows the extent to which the 2011 Census distribution of the estimated number of usual residents by age (5 year age bands) aligns with the appropriate comparator datasets. Figures 2 and 3 present this information separately for males and females respectively, with Figure 4 illustrating the associated sex ratio distribution (i.e. number of males per 100 females).

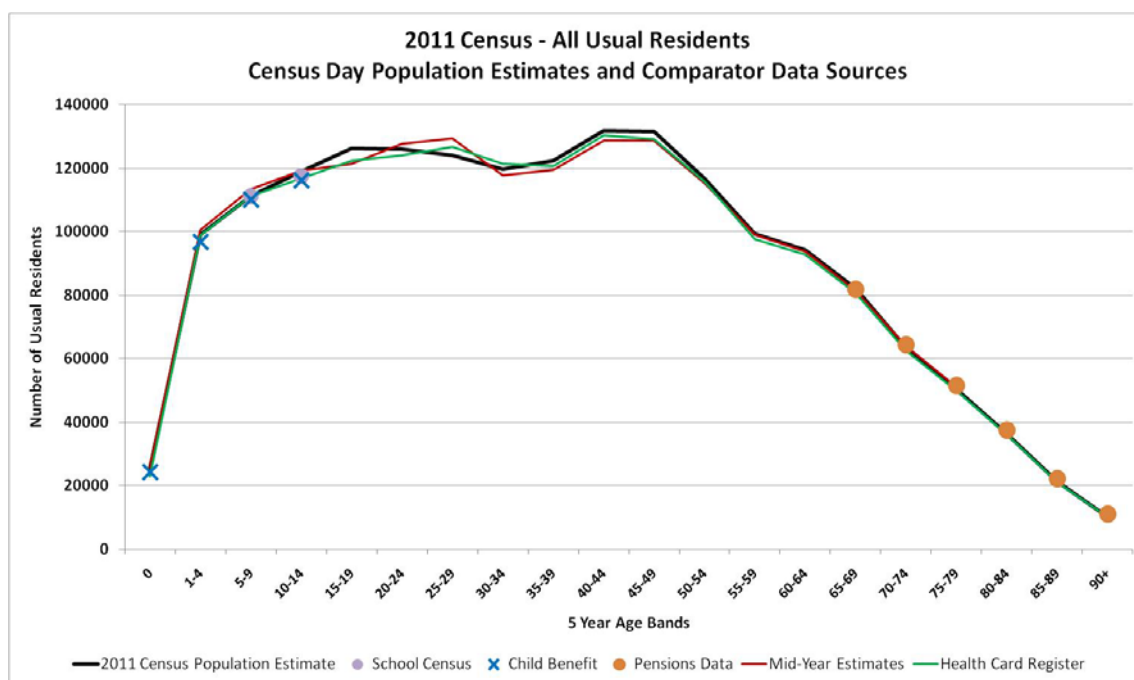Figure 1 – All Usual Residents on Census Day

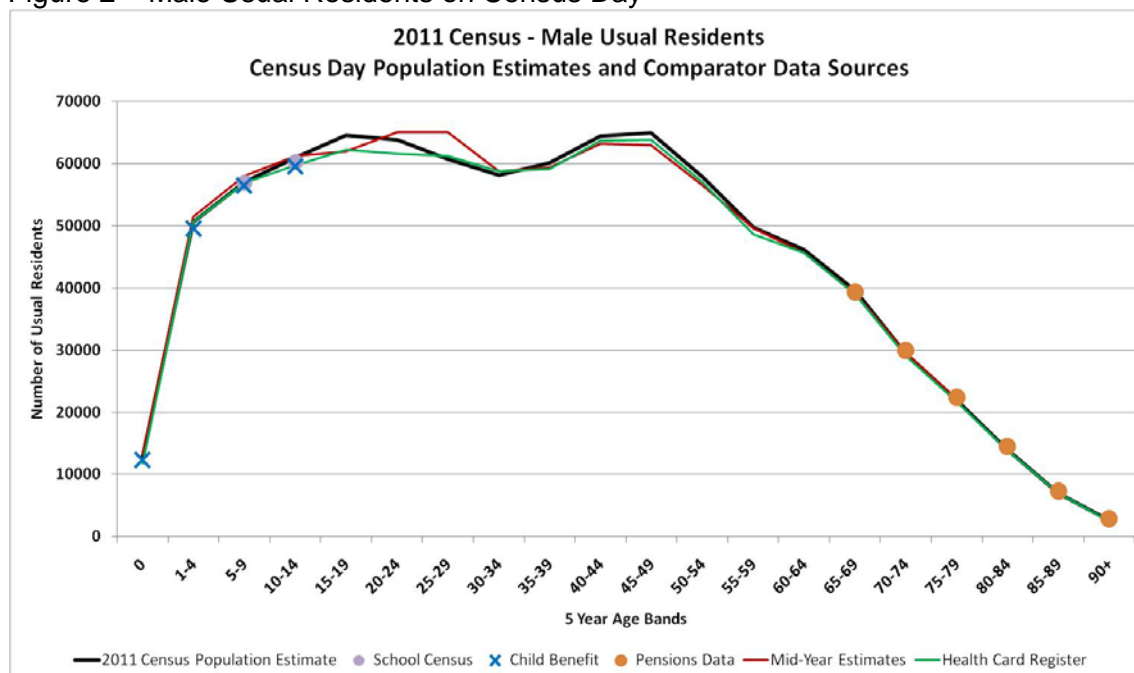Figure 2 – Male Usual Residents on Census Day
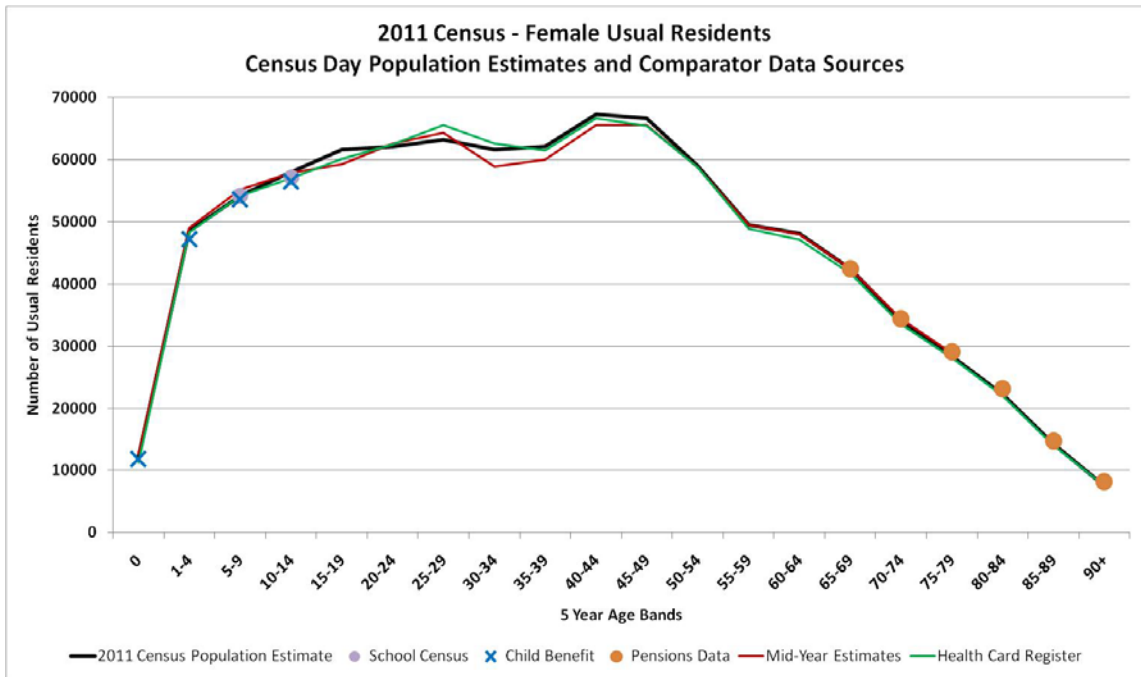
Figure 3 – Female Usual Residents on Census Day

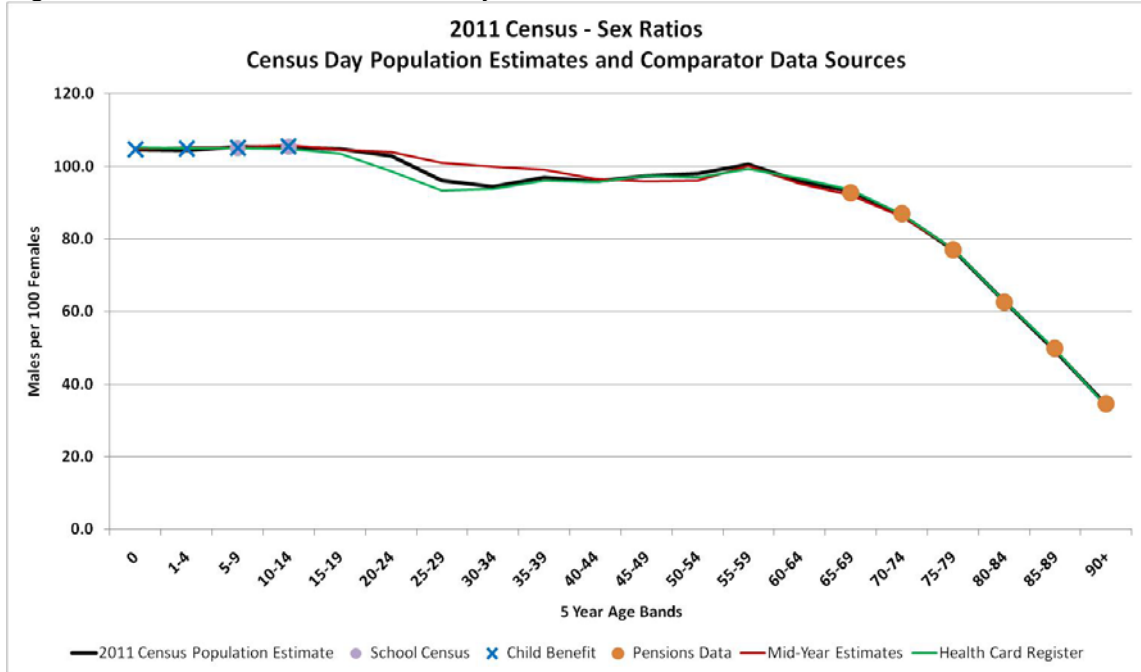

Figure 4 – Sex Ratios on Census Day

5.2 The charts show a relatively strongly degree of alignment between the 2011 Census estimates and the various comparator data sets across the different age categories. This is particularly the case in the age groups 0-14 years and 65 years and over where (i) the comparator data is noted for its comprehensive coverage and quality and (ii) the respective populations tend to be easier to enumerate.

5.3 Activity levels on the Medical Card Register among males are known to be lower than that for females and, in general, can be considered as indicative of a lower bound. On this basis, the gap between the Census estimates and the Medical Card Register comparator data for males in the age range 15 – 24 is not altogether surprising. Other factors that limit the inferences that can be drawn from comparisons between the Census estimates and the Medical Card Register are discussed in more detail in Annex 2 of the Quality Assurance of the 2011 Census in Northern Ireland document. These include, for example, list inflation, delays in the general public updating their details and difficulty in distinguishing between usual residents and short-term migrants.

5.4 One of the key uses of the decennial Census is to provide a benchmark for the estimated population. NISRA plans to re-calibrate the 2001 Census based population estimates series on the basis of the 2011 Census data and will publish the results in due course.

6   Conclusion

6.1   Quality considerations have been integral to the design and conduct of the 2011 Census in Northern Ireland. Following both the successful field work and data capture and coding phases, the information was adjusted for under-enumeration in accordance with tried and tested methodologies to ensure that the results were representative of the entire population. The resulting Northern Ireland population estimates by age and sex have been subjected to comprehensive quality assurance as detailed in the body of this report. The coverage, quality and plausibility of the estimates are strongly supported by their close alignment with the appropriate comparator datasets and, as such, they are considered to be fit for purpose.

7 Further releases

7.1 Planned Release Schedule

Information from the 2011 Census will be made available through a number of planned releases, as outlined in the table below. Detail of the information that will be included in each of these releases can be found in the Northern Ireland Census 2011 Output Prospectus.

Phase 1 of first release	**16 July 2012**
Phase 2 of first release	**September 2012**
Second release	**November 2012 – February 2013**
Third release	**March – June 2013**
Fourth release	**July – October 2013**

7.2 Contact Details

For further information relating to the 2011 Census please contact:

Census Customer Services

McAuley House,
2-14 Castle Street,
Belfast,
BT1 1SA

Phone: 028 9034 8160
Fax: 028 9034 8161
Email: census.nisra@dfpni.gov.uk

Website: www.nisra.gov.uk

2011 Census

Quality Orientated Initiatives

- The development of an authoritative address register to support the delivery of Census questionnaires;

- The implementation of a robust field methodology that identified and rectified deficiencies in the address register through a full address check, followed-up any undelivered questionnaires, followed-up any non-responding households, and identified those non-responding households from which a completed questionnaire would have been expected (this is key from a coverage assessment perspective);

- The postal delivery of Census questionnaires by Royal Mail with each questionnaire incorporating a unique barcode associated with each address to facilitate both the delivery and tracking of the questionnaires;

- The provision of an internet response channel;

- The provision of public interface services, including the provision of a dedicated 2011 Census 'self-help' website, a dedicated telephone help line and an in-house 'fulfilment' team to respond to requests from the general public and get a questionnaire out to any newly identified addresses;

- The implementation of a comprehensive publicity campaign to ensure that everyone realised the importance of the Census and their obligation to take part;

- The development and implementation of a comprehensive data capture requirement specification with challenging associated service levels and quality control measures; and

- The development of robust "Downstream' processes to, for example,

  ► validate that the captured data was in accordance with the agreed specification and service levels;

  ► identify and address any duplicates in the data;

  ► identify any missing items in the data and impute the required values in accordance with the methodology agreed across the UK;

  ► undertake an assessment of coverage and adjust the results as appropriate; and

  ► apply the necessary statistical disclosure control techniques in order to ensure that the confidentiality of the information provided by the general public is protected in the aggregate outputs produced from the Census.

Table 1: 95 Per Cent Confidence Intervals for Population and Household Estimates

	Census Estimate	95% Confidence Interval
Usually Resident Population	1,810,900	± 11,000
Households	703,300	± 2,800

Table 2: 95 Per Cent Confidence Intervals for Population Estimates by Age Band and Sex

AGE	Males		Females	
	Census Estimate	95% Confidence Interval	Census Estimate	95% Confidence Interval
0-4	63,500	± 1,200	60,900	± 1,200
5-9	57,100	± 800	54,200	± 800
10-14	61,000	± 700	58,000	± 700
15-19	64,600	± 900	61,600	± 800
20-24	63,900	± 1,600	62,100	± 1,400
25-29	60,800	± 1,500	63,300	± 1,100
30-34	58,200	± 1,500	61,600	± 1,200
35-39	60,200	± 1,300	62,100	± 1,200
40-44	64,500	± 1,200	67,300	± 700
45-49	65,000	± 800	66,700	± 600
50-54	57,900	± 1,000	59,100	± 500
55-59	49,800	± 700	49,500	± 500
60-64	46,200	± 600	48,100	± 400
65-69	39,600	± 300	42,500	± 400
70-74	29,500	± 200	34,000	± 300
75-79	21,900	± 100	28,400	± 200
80+	23,600	± 200	44,100	± 300