



NORTHERN IRELAND

2011 CENSUS OUTPUTS STRATEGY

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1 Introduction

1.1 The purpose of this paper is to outline NISRA's strategy for the production and dissemination of the outputs from the 2011 Census.

The strategy seeks to build on the positive initiatives introduced through the 2001 Census, which gave rise to:-

- Considerable volumes of Census results being released electronically on the internet for the first time;
- Results being released on a variety of different media (e.g. web, printed paper reports, CDs) and in different formats to cater for different user requirements;
- An enhanced customer service function geared towards improving the experience of users wishing to request specific information that was not already available in the information already released; and
- The development of the Northern Ireland Census Access system, which provided the opportunity for users to, for example, amalgamate the published results for a combination of specific geographic areas and present the results using thematic maps.

1.2 The content of the strategy has been informed through the consultation work undertaken in conjunction with users in June 2010 and most recently, in March 2011. As such, the strategy reflects the current thinking in terms of optimising the 2011 Census Outputs to maximise the benefits to users.

1.3 Having said that, the strategy is very much focussed on the four high level strategic aims that have underpinned all of the Census planning and development work to date. These are detailed in paragraph 2.4.

2 Context / Background

Statement of Agreement between the Registrars General (Northern Ireland and Scotland) and the National Statistician (England & Wales)

- 2.1 The Registrar General for Northern Ireland along with the National Statistician for England & Wales and the Registrar General for Scotland have made a Statement of Agreement about the conduct of the 2011 Censuses across the UK. This includes an annex relating to the agreed aims for 2011 Census Outputs, based on feedback from users of the 2001 Census outputs.
- 2.2 Strategically, the essential elements include:
- A common UK SDC methodology for Census 2011 outputs that minimises disclosure risk whilst maximising data utility;
 - A joined-up and co-ordinated quality assurance policy to involve internal and external experts and bodies;
 - Joined-up and comparable UK outputs, using a fully adjusted database as in 2001, with the concurrent first release of statistics across the UK in accordance with a pre-release output prospectus and timetable that is adhered to;
 - Outputs free at the point of delivery, using dissemination methods and media that are up to date with technological innovation, with the provision for user defined on-line flexible table generation.
- 2.3 The strategy set out in this document specifically refers to Northern Ireland. However, NISRA continues to work closely with the General Register Office for Scotland (GROS) and the Office for National Statistics (ONS) to ensure UK comparability, meet the aims in the Registrar Generals' agreement and ensure a single point of access to UK-wide outputs.

High Level Strategic Aims for the 2011 Census

- 2.4 As outlined earlier, all of the planning and development work for the 2011 Census in Northern Ireland (including that pertaining to this strategy) has been underpinned by four high level strategic aims. These are:-
- 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.
- 2.5 All have a direct relevance to the key thrust of the 2011 Census Outputs Project, which is to provide comprehensive and robust statistics that:-
- (a) Are fit for purpose and meet the needs of users, while protecting the confidentiality and integrity of the information provided by the general public; and

- (b) Are released in a timely manner using a variety of media that makes them both easily and readily accessible to Census users.

3 Uses of Census Information

3.1 The Census, which is the largest single statistical exercise undertaken by government, remains the most important source of information on the size and nature of the population. For many years, the Census has been relied upon to underpin national and local decision making. Some 200 countries world-wide now carry out a regular census under the auspices of the United Nations Census Programme.

Shaping Government policy

3.2 The Census is widely acknowledged as playing a fundamental and unique role in the provision of comprehensive and robust population statistics. Census information is needed to form policy, to plan services for specific groups of people and, especially, to make effective use of resources through the spatial distribution of resources to where they are needed. The information must be authoritative, accurate and comparable for all parts of Northern Ireland. Currently, only a census can provide the range of such information on a uniform basis both about the country as a whole and about individual small areas and sub-groups of the population in relation to one another.

3.3 Basic information on the population size, age, sex and location are fundamental to many government policies including those in respect of:

- ageing and pensions;
- migration both into and out of the country, and internally;
- long-term sustainability of Gross Domestic Product (GDP) growth and thus long-term sustainability of government revenues; and
- labour supply and, thus, inflationary pressures.

3.4 Information on housing, household size and family make-up is key for:

- redressing inadequate accommodation and over-crowding; and
- estimating local housing demand.

3.5 While other information collected as part of the Census:

- provides a better understanding of pressures on transport systems and the planning of roads and public transport using information collected on travel to and from work, and on car ownership;
- enables the identification of areas of deprivation for targeting initiatives such as Neighbourhood Renewal;
- provides information on ethnicity, qualifications and labour market status for instance, to explore the causes of deprivation and appropriate policy interventions;

- shows how many people work in different occupations and industries throughout the country, helping government and businesses to plan jobs and training policies and to make informed investment decisions.

Benchmarking

3.6 Importantly, the Census provides the basis for deriving many social and economic indicators such as:

- population estimates;
- employment and unemployment rates;
- birth, death, mortality and fertility rates;
- equality monitoring, in particular census information on age, sex, ethnicity, religion, and disability help to identify the extent and nature of disadvantage and to measure the success of equal opportunities policies;
- grossing-up sample survey data, in particular the Census underpins socio-economic surveys carried out by government and the private sector, as many survey results are grossed to census population counts.

3.7 Without the Census such surveys would be less reliable or would need to be larger and more costly.

Allocation of resources

3.8 All government departments and many other organisations, both in the public and private sectors, allocate resources on the basis of population statistics based on census estimates. For example, the Department of Health, Social Services and Public Safety (DHSSPS) allocates about £2.5bn annually to Health Service Trusts to ensure that access to services reflects real needs. Without a census, substantial funds to a range of services would be misallocated annually.

Local investment and monitoring

3.9 The Census drives the targeting of local services such as:

- local health for which census questions on illness are good predictors of the likely demand on the Health Service;
- local education needs, with the Census providing information that can assist the siting of new schools;
- local transport planning and traffic modelling;
- development plans to ensure that development happens at the right locations; and
- community support services, such as home help and home care.

Use by businesses

3.10 As part of the business case for the Census in England and Wales, the Office for National Statistics has estimated the value of census data to businesses in the UK,

counted over the 10-year cycle, to be in the region of £250m. A pro-rata population based allocation of this implies a value for Northern Ireland of around £7m.

Research

3.11 The Census is an excellent source of data for important research purposes. The Northern Ireland Longitudinal Study is based on a large sample of census records linked together from the 1991 and 2001 Censuses, combined with other sources such as vital event data (births and deaths) and health service registrations. This provides an unrivalled source for the examination of change over time. Such studies increase our understanding of social conditions and can shed light on the impact of policies. For example, this data set has enabled the mortality rates of different socio-economic groups to be compared. In conducting all such research, personal details are separated from census responses so that no identifiable information can be linked to the name and address of individuals. In addition, when data are published, great care is taken to ensure that reports are anonymised so that no individual data can be identified.

4 User consultation

- 4.1 Since the first release of 2001 Census results, feedback has been actively sought regarding all aspects of the Northern Ireland census output and dissemination strategy. Annex 1 provides an overview of the approach that was adopted in 2001.
- 4.2 For example, in 2004, NISRA held a series of road shows to raise awareness of the 2001 Census results and ensure users understood how and where users could access them. These events helped to shape NISRA's initial thinking in terms of the requirements that were regarded as priorities by users (e.g. a pre-tabular disclosure control policy) and the steps that we should consider to improve the user experience (e.g. a single point of access).
- 4.3 Through a variety of user forums (utilising web surveys, blogs and wikis) and engagement with special interest groups (e.g. Census Advisory Groups across the UK, Microdata Working Group) Census Office has gained a more authoritative understanding of the high level needs of census users.
- 4.4 The most recent round of consultation was conducted in the spring/ summer of 2010. This comprised of an engagement with NISRA Heads of Branches in Government Departments and the Northern Ireland Census Advisory Group (two recognised key groups of users in the Northern Ireland context) followed by two public road shows held in Belfast and Omagh). As highlighted through the attached link <http://www.nisra.gov.uk/Census/2011%20Census/2011%20Census%20Planning/Consultation.html>, this provided the opportunity for users to share their thoughts on a number of more specific areas including:
 - The content of the outputs and the order in which they should be produced;
 - The disclosure control policy and their desire for tables that are consistent and additive;
 - The dissemination platform; and
 - The underlying 2011 Census geography.

4.5 The outcome from all of these activities has heavily influenced the 2011 Census Strategy and associated policy decisions in Northern Ireland. Importantly, the strategy seeks to optimise the use of available resources in Northern Ireland while exploiting the efficiencies that can be gained through joint work with the other UK Census offices.

5 Aims / Vision for 2011 Census Outputs

5.1 The high level strategic aims outlined above, coupled with the undertakings given in the Registrars Agreement, have played an integral part in shaping NISRA's vision for the 2011 Census outputs in Northern Ireland. Importantly, the vision recognises the key lessons learnt from the 2001 Census and demonstrates that NISRA has actively listened to its key users in Northern Ireland (and indeed those from further afield). While challenging and requiring a significant contribution of resources, NISRA will aim to:-

- Produce the 2011 Census outputs using recognized international and, in the absence of these, UK based classifications such as SIC, SOC and NSSEC.
- Ensure that Census outputs are widely accessible to all those that need them;
- Provide a single point of access to 2011 Census information (both for NI and for GB) through its much used Northern Ireland Neighborhood Information Service (NINIS);
- Optimise e-dissemination by making a core set of tables (similar to 2001 but as required by users and reflecting definitional changes and changes introduced to the Census questionnaire) freely available on-line. This will involve working collaboratively with the other UK Census Offices in order to harmonise the outputs wherever possible;
- Provide users with the flexibility to generate their own tables from pre-defined 'data-cubes' that have been appropriately protected from a statistical disclosure control perspective;
- Publish a limited number of paper reports, where there is a clear user need to do so;
- Actively respond to user requirements for the bulk download of data in a variety of formats;
- Consider the feasibility and cost effectiveness of producing 2011 results on alternative media such as CD/DVD;
- Deliver an efficient customer service function, as in 2001, to respond to user queries and deliver ad-hoc queries as and when required;
- Provide access to comprehensive metadata that is released along with the various output products and facilitates understanding of the information;
- Implement a Statistical Disclosure Control policy that, is common across the UK, ensures tables are both consistent and additive;
- Continue to support specialised services such as the Northern Ireland Longitudinal Study (NILS) and the Samples of Anonymised Records (SARS), both of which play a pivotal role in the vital research that the Census supports;
- Widen the access to, and utility of, Census information by embracing and responding positively to the technological innovations arising through the provision of 'open sourced data' and application programming interfaces (APIs);

- Develop a 2011 Grid Square Product, thus continuing the time series on a consistent geographical basis that is available back to the 1971 Census; and
- Where feasible, fulfil Northern Ireland's obligations in respect of the relevant European Regulations for the provision of Census type information.

6 2011 Census Outputs Geography

- 6.1 As in 2001, the results from the 2011 Census will be made available at a variety of geographical levels. In 2001, local government boundaries (26 Local Government Districts, composed of 582 electoral wards) formed the geographic basis of census outputs and it is proposed that a similar approach is taken for outputs from the 2011 Census.
- 6.2 By way of background, for the reporting of the 2001 Census results, Census Output Areas (COAs) and, in turn, Super Output Areas (SOAs) were specifically developed as the geographic building blocks. There are 5,022 COAs each containing, on average, about 125 households and 350 persons. SOAs are larger areas constructed from groupings of COAs and have been extensively used for deprivation measures, the publication of Neighbourhood Statistics and for a range of key statistics from the 2001 Census. While electoral wards are administrative units, they have widely differing populations ranging from about 800 for a number of wards in Moyle to over 8,000 in parts of Belfast. Some 890 SOAs – each based on an aggregate of COAs – were created, each with a population of around 2,000 and all constrained to ward boundaries. Most wards are also SOAs, with larger wards – such as those in Belfast – divided into a number of SOAs.
- 6.3 Under current proposals, it is unlikely that new local government boundaries for Northern Ireland will be in place before the outputs from the 2011 Census are published. As such, existing ward and Local Government District (LGD) boundaries will remain in place and any lower level geography for 2011 should ultimately nest within these.
- 6.4 As mentioned in 6.1, the 2011 Census Outputs will be made available at a variety of geographic levels, i.e. the administrative geographies mentioned in 6.3 and also for higher level geographies that are currently aggregates of the existing LGDs (e.g. Health and Social Services Boards, Education and Library Boards and NUTS3 areas). Outputs for Electoral Areas such as the Assembly Areas used in the May 2011 elections, which are the same as the Parliamentary Constituencies used in the recent 2010 Westminster elections, are planned but will be subject to disclosure considerations in the small number of instances where these areas are not the simple aggregation of electoral wards.
- 6.5 It is recognised that ten years on some 2001 COAs now either (i) contain too many households (and hence are above threshold), (ii) contain too few households (and hence are below threshold), (iii) are not homogeneous in their socio-economic characteristics, or (iv) are accepted to be neither well constructed nor intuitive in terms of their shape. In developing its approach for 2011 lower level geographies, NISRA plans to seek the views of users (at its planned consultation in late February/early March 2011) in terms of :-
- Leaving the 2001 COAs unchanged provided they meet the minimum threshold criteria;
 - Completely re-drawing the 2001 COAs, hence losing comparability with 2001;

- Re-drawing the worst, say 5%, of COAs that have experience the greatest change.

7 NINIS as the primary dissemination tool

- 7.1 NISRA has invested considerable resource to the development and maintenance of NINIS (www.ninis.nisra.gov.uk) since it went into operation in 2003. It represents a 'one-stop-shop' giving access to over 1200 demographic and social statistics datasets derived from, for example, the 2001 Census, social surveys and administrative sources and has a well established user base. In order to optimise the utility of NINIS, NISRA has delivered tailored training to users, who particularly value the area profiles, interactive maps and both data & map catalogues that are available, typically making in excess of 15,000 visits per month. In addition, a dedicated customer service function is already in place and working effectively.
- 7.2 As part of its 2011 Census Outputs Strategy, NISRA took the decision to re-develop NINIS in order to modernise the technology being deployed and ensure the vision outlined above was achievable. To that end, a contract was awarded to RM Data Solutions to undertake the necessary development work with the aim of having the necessary re-development work completed and the new system populated with existing datasets by summer 2011 (some 10/12 months ahead of the first results from the 2011 Census being released). Thereafter, tailored training will be provided to users in order to ensure they are familiar with the new system in advance of the release of 2011 Census results.
- 7.3 It is envisaged that users will be able to access all of the core tables, ad-hoc tables and user defined tables directly through NINIS, using an easy to navigate user interface. Users who require access to more specialist products such as microdata will be able to access these via secure mechanisms such as the Virtual Microdata Laboratory or the Secure Data Service that are centrally managed by the ONS on behalf of the UK Census offices.
- 7.4 In terms of developments in the areas of 'open sourced' data and APIs, NISRA's Census Office will be working collaboratively with the other UK Census Offices to consider how the technological advances in these areas might best be incorporated into its e-dissemination strategy.
- 7.5 A number of key challenges are anticipated in terms of the re-development of NINIS, including:-
- **Marketing** – to ensure that users are aware of the development and implementation timetable for the new system;
 - **Training** – to ensure that any current (and new) NINIS users are re-trained in its use (this will be demanding and will need to be carefully managed given the high number of users involved);
 - **Data Migration** – in addition to uploading any 2011 Census results, a considerable volume of data (and supporting metadata) will have to be migrated across from the current NINIS system. This exercise will require detailed quality assurance to ensure that none of the information is inadvertently corrupted in the file transfer process.
 - **Performance** – extensive volume testing will be required given the potential for a large number of users to seek access to the new system simultaneously;

- **2001/ 2011 comparability** – it is anticipated that users will require specific guidance on the comparability of 2001/ 2011 Census results.
- **Customer Service** – it is envisaged that NISRA will have to expand the customer services team that currently responds to all Census, NINIS and demographic statistics queries given the potential for large numbers of calls in respect of the use of NISRA and how to access 2011 Census data.

8 Challenges and Other Issues

- 8.1 In order to achieve our aim of getting the greatest value possible from the census data we need to ensure it is both easily accessible and includes the right content to meet the user needs. At the same time, we need to protect (and be seen to protect) the confidentiality of the information provided by the general public and achieve value for money.
- 8.2 While the approach of deploying a pre-tabular statistical disclosure control (SDC) methodology is highly appealing to users, not least as it delivers tables that are both consistent and additive, it presents challenges to Census Office in terms of its implementation (for example, what tables are safe at what levels of geography). This is particularly the case in terms of the provision of anonymised aggregate 'data cubes' that will allow users to define and generate their own tables. Key decisions will have to be taken in terms of the content that is available for particular geographic areas in order to ensure that the degree of SDC that is applied, does not adversely impact on the integrity and utility of the underlying data.
- 8.3 The advancement of this strategy will require significant work, in a relatively short period of time, in order to:-
- Establish the 2011 Census Outputs table production system and ensure that both the infrastructure and associated access protocols accord with the appropriate Information Assurance standards [Autumn 2011];
 - Establish, in conjunction with the other UK Census Offices, the specifications of the 2011 Census tables that will be produced and agree which of them can be produced on a harmonised basis across the UK [Autumn 2011];
 - Finalise the 2011 Census SDC methodology that will be deployed in respect of each of the planned products, including those that are more specialised in nature (e.g. origin-destination statistics) [Spring 2011];
 - Decide what metadata will be produced and how it will be integrated along with the various outputs products [Autumn 2011];
 - Develop the 2011 Census Outputs Geography, taking account of those 2001 Census output areas that have changed significantly since their introduction [Spring 2012];
 - Develop and publish (as far as possible in advance) a robust timetable that outlines to users when the various products will be released [TBA with other UK Census Offices];
 - Work collaboratively with the other UK Census Offices to establish a manageable and sustainable charging policy that will apply to the ad-hoc query service [TBA with other UK Census Offices – Spring 2012];

- Agree with the users and the other UK Census Offices what microdata samples, including how they can be accessed, will be made available [TBA with other UK Census Offices – Spring 2012];
- Ensure that Northern Ireland meets its obligations in respect of the relevant European Regulations on the 2011 Census Outputs [Ongoing].

9 Quality Assurance of the results

- 9.1 Again, in keeping with its high level strategic aims, NISRA's Census Office will develop and implement a Quality Assurance Strategy seeks to ensure that the 2011 Census results are fit for purpose and released in a timely manner.
- 9.2 In keeping with best practice, this strategy will be published on the Census Office section of the NISRA web-site and discussed with users.

10 Conclusion

- 10.1 This strategy seeks to build on the positive initiatives introduced through the 2001 Census. The content has been informed through the consultation work undertaken in conjunction with users and through collaborative work with the other UK Census Offices. In addition, it recognises the need to deliver outputs that fulfil Northern Ireland's obligation in respect of the European Regulation for the provision of Census type information.
- 10.2 Importantly, the strategy seeks to deliver on the aims that are implicit in both the Registrar General's agreement and the high level strategic aims for the 2011 Census, which have been informed by the lessons learnt from 2001.
- 10.3 While challenging, the strategy seeks to improve the user experience by providing a single point of access to all Census results, implementing a pre-tabular statistical disclosure control methodology, optimising e-dissemination and releasing a core set of tables and other products that specifically meet the needs of users. The strategy also recognises the importance of (a) implementing robust and authoritative quality assurance procedures in order to ensure that the outputs are fit for purpose and, (b) informing users in advance of exactly what outputs will be delivered and to what timetable.

The 2001 Approach

Users of census information in Northern Ireland ranged from students to academic researchers to government statisticians and policy developers. They accessed the 2001 Census information in the following ways:

- Via printed reports (pre-defined tables)
- Via Census customer Services (ad-hoc query service, methodological advice)
- Via the NISRA website (pre-defined tables, census glossary)
- Via CD/DVD products (geographic information, origin-destination statistics)
- Via Microdata laboratory (SARS)
- Via Northern Ireland Census Access (NICA) (pre-defined tables, thematic mapping)
- Via ESRC funded projects (Grid Square product - Manchester University)

Printed Reports

This was the main media by which 2001 Census tables were output. They were a legislative requirement and were available to purchase via The Stationary Office.

Census Customer Services

Users were able to telephone, email or write in to a dedicated team that were responsible for advising, disseminating and informing users of all aspects of the 2001 Census. The team incorporated an ad-hoc query service which allowed users to request information that was not included in the pre-defined set of tables that formed the standard output from the census. This output medium was generally well accepted and used frequently by users.

NISRA Website

This was the most frequently used output media for disseminating 2001 Census information. All printed reports, tables, metadata and geography information relating to the 2001 Census was made available via this channel and was well accepted by census users. This web site continues to be used to this day and is the main source of information relating to all things that are census related.

CD/DVD Products

While not used extensively in Northern Ireland, the CD/DVD products provided users with a source of bulk information from the 2001 Census and formed an important output medium for users wishing to load data into their own systems for analysis.

Microdata Laboratory

This output medium was operated and maintained by the ONS and allowed users to access samples of anonymised records from the 2001 Census for specific research purposes. This medium was not used widely by users of census information in Northern Ireland.

Northern Ireland Census Access (NICA)

A custom web application that was intended to be the main source of census information in Northern Ireland. The application was developed with the functionality to select topics of interest and geographic areas in order to obtain the most appropriate 2001 Census information. Facilities were incorporated to allow users to view, download and map the data that they retrieved from their searches. In addition, all 2001 Census metadata was incorporated into the system as reference information.

While the expectation was that NICA would be the main hub for users to access 2001 Census data, it was finally launched when most users had already accessed the data via the NISRA web site, and indeed had become accustomed to doing so – as such, take up of the system was low. Subsequently, the decision was taken to cease to support the NICA system as a source of 2001 Census information

ESRC Funded projects

2001 Census information was also made available to academia via the ESRC. From a Northern Ireland perspective the most notable ESRC project was MIMAS which was the main dissemination medium used for the 2001 Census Grid Square product. A small ad-hoc search facility was retained by the Census Customer Services Team but the bulk data download was limited to the MIMAS website.

Each user group brings with it a variety of levels of experience in using census data and a similar variety of requirements for access and uses of the data. Delivering systems and services for 2011 which meet the full requirements of all would not be practical or financially viable. We will therefore seek to deliver a service which meets the common user needs whilst working with partners to extend functionality to meet the specific needs of certain groups.