Scotland's Census 2022

Outputs Strategy

For comment and feedback

February 2022

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1.   Introduction

1.1   This document sets out the National Records of Scotland (NRS) strategy for the dissemination of statistical outputs from the 2022 Census. The strategy is intended as a discussion document that will be revised following stakeholder engagement and will continue to be developed in conjunction with other parts of the UK, to ensure consistent UK census outputs wherever possible. It will also follow the principles set out in the NRS dissemination strategy which is currently under development. In particular, there will be a focus on open data and digital first.

The strategy seeks to support the production of outputs that will meet user requirements and will be timely, accurate and flexible. This will include:

- Preparation of a dissemination timetable;

- Production of a core set of standard census tables (including potentially unperturbed Scotland and Council area tables);

- Development of a flexible table builder that enables users to create their own tables that meet their specific needs;

- Variable breakdowns based on population size rather than only standard questionnaire response options;

- Enhanced data visualisations to aid understanding of the information;

- Incorporation of metadata into all outputs to inform users.

1.2   The resulting vision and strategy for 2022 Census outputs has been developed through on-going engagement work undertaken with stakeholders after the 2011 Census outputs were produced; including a short life outputs working group and stakeholder events held in June 2017.

1.3   The detailed content and features of the statistical outputs to be produced and disseminated from the 2022 Census will be informed by an on-going and extensive programme of engagement with users of census data.

2.   Background

2.1   Conduct of Censuses in the UK

The Census Act 1920 provides the legal framework for conducting the Census in Scotland. The Act makes the Registrar General for Scotland, under the discretion of Scottish Ministers, responsible for arrangements for the Census in Scotland.

In England and Wales, responsibility for the Census lies with the UK Statistics Authority and the Office for National Statistics (ONS). In Northern Ireland, the census is the responsibility of the Registrar General for Northern Ireland and the Northern Ireland Statistics and Research Agency (NISRA).

2.2 Harmonisation

The UK National Statistician, Registrar General for Scotland and The Registrar General for Northern Ireland released a 'Statement of agreement' in October 2015 on the conduct of the Censuses. In this document they indicated that they intended to conduct the next census simultaneously across the UK. A similar agreement was developed for the 2011 Censuses that is believed to have enhanced the extent of harmonisation across the Censuses throughout the UK.

The agreement recognised that Census outputs should constitute consistent, coherent and accessible statistics for the UK, individual countries and geographic areas within each country. Common definitions and classifications, typically based on international standards, should be agreed, used and published. Common topics and questions should be agreed wherever possible, with the intention of making available consistent census outputs across the UK.

2.3 User Consultation

NRS will continue to engage with stakeholders as our plans develops further to ensure that the 2022 outputs meet user needs. The information gained through these activities will be carefully considered in our work to further develop and enhance the Scotland's Census 2022 Outputs Strategy.

3. Vision for 2022 Census Outputs

3.1 NRS vision for the dissemination of Scotland's Census 2022 results is to provide users with easy access to all census information (subject to disclosure control restrictions) and enable users to make the best use of the latest advances in technology to access and analyse the data.

Key objectives for Scotland's Census 2022 are to:

- Provide complete, accurate and accessible population statistics, which meet users requirements, on a consistent and comparable basis nationally and for small areas and small population groups;

- Build public confidence and encourage participation in the census, thereby maximising response rates nationally, locally and among sub-groups of the populations;

- Protect and be seen to protect, confidential personal census information as required under the 1920 Census Act(Scotland), 1991 Census Confidentiality Act, 1998 Data Protection Act and The Census (Scotland) 2010 Regulations;

- Provide value for money.

3.2   In order to realise the greatest benefits from the census data it needs to be made easily accessible and have the right content to meet user needs, subject to the constraints of protecting the confidentiality of personal census information and achieving value for money.

3.3   The current proposals for the 2022 Census outputs have been informed by engagement with users and seek to build on the positive initiatives introduced through the 2011 Census. This will include:

- Start publishing results from the census approximately a year after collection;

- Producing a core set of standard census tables;

- Providing more functionality in creating tables by utilising a flexible table builder with in-built cell key perturbation;

- Producing non-standard outputs: Microdata sets, origin destination data and daytime/workplace population data;

- Creating interactive visualisations that link to the data to encourage a wider range of users to use the census data;

- Producing an updated website that coincide with the 2022 Census Data to improve the workflow and overall experience;

- Improving wider customer access to data by developing mobile-optimised products and providing Application Programming Interface (API) functionality. We also hope to enable users to access UK level data from one place through the use of APIs.

4.   Data Confidentiality

4.1   As stated above in the key strategic objectives, there is a legal requirement to protect statistical confidentiality. Statistical Disclosure Control (SDC) is used to protect individuals, households and organisations and their characteristics from identification in published results.

4.2   In Scotland's Census 2011, NRS used targeted record swapping and table redesign to protect against disclosure. In this method, every individual and household was assessed for uniqueness on the basics of small number of characteristics and every household was given a risk score. A sample of households was selected for

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swapping, largely depending on the household risk score. However, every household had a chance of being swapped. Once selected it was swapped with another 'similar' household form another area.

4.3   For the 2022 Census we are planning to build on what was done in 2011. We will continue to use targeted record swapping, but will combine this with cell key perturbation rather than table redesign. This change is required in order to enable flexible table building. A similar method is currently used by the Australian Bureau of Statistics on their census data.

The cell key perturbation method makes small changes to some of the cells in a table to add more uncertainty to protect against disclosure, particularly disclosure which occurs when one table is compared to other tables with similar data. Therefore, this method will allow for more flexibility in table design and more timely release of the census data than previously. Cell key perturbation will be built in the output dissemination system and will also be applied to internally produced tables, where relevant. Further information on this methodology is available in the presentation from the June 2017 stakeholder event at: http://www.scotlandscensus.gov.uk/statistical-disclosure-control-and-outputs-event.

We are currently investigating whether we can release data at higher levels of geography, Scotland and Council area without the use of cell key perturbation. The risk of disclosure is much lower for higher levels of geography as the populations are larger and it is more difficult to identify information about individuals. This will also enable users to have numbers that are fully consistent and add up for these geographies.

4.4   The prototype of the flexible dissemination system is being developed and statistical disclosure control methodology will be carefully tested using the combination of synthetic and rehearsal data in advance of the census.

5.   Meeting user needs

5.1   2022 Census Output Geographies

Geography is a key element of the census outputs. As in 2011, the results from the 2022 Census will be made available at a variety of geographical levels.

Census Output Areas (COA) will continue to be the smallest geography for which census results will be produced and will form the building bricks for the census outputs for all higher geographies. Census Output Areas will be built from frozen postcodes which will fit exactly within Council Areas - NRS split postcode policy is to continue.

NRS and Scottish Government (SG) plan to work jointly on production of Census Output Areas and Data Zone (DZ) geographies to prevent the delays experienced in

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2011. Further information on these geographies is available at
http://www.scotlandscensus.gov.uk/census-geographies.

The methodology for the non-standard geographies such as: Workplace Zones,
Travel to Work Areas and grid squares is being developed in conjunction with ONS
and NISRA.

5.2   Comparability with previous Censuses

Meeting user need and consistency with previous Scotland Censuses are high
priority objectives for the 2022 Census. Users have indicated for some questions,
changing the question to improve the data quality is more important than direct
comparability. NRS is working to ensure that unless there is a strong user need, any
changes to the questions designed for the 2022 Census will not significantly affect
data comparability over time.

6.   Quality Assurance of output products

6.1   NRS 2022 Census Outputs project has a responsibility to ensure that the
products released to users are accurate and also adhere to wider quality standards
as defined by the UK Statistics Authority. Work is underway to establish what
procedures, processes and resources will be required to achieve this

7.   Dissemination

7.1   As in 2011, the web will be the main platform for results dissemination. Core
outputs and tables will be published on Scotland's Census website. However, the
number of standard tables will be reduced as our primary focus is to enable access
to census data via flexible table builder facility. The flexible table builder will enable
users to create their own tables, so this will reduce the need for the wide range of
standard tables.

7.2   Due to the changes in statistical disclosure control methodology and the use
of a flexible table builder, we plan to change the order in which outputs are released.
In particular, rather than producing the first release and then univariate tables, we
are planning to produce the first release and then multivariate council area tables.
We will also be taking into account the need for UK harmonisation around timing and
content of outputs so the exact timings and details may be subject to change at this
stage. A proposed release schedule with a broad estimate of release dates and
content is included in the annex.

7.3   For the standard tables that we produce, and the variable breakdowns
available within the flexible table builder, we are planning to take account of
population size rather than only standard questionnaire response options. For
example, In 2011, the religion question had tick box options and a write in box,

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however for standard outputs the variable breakdown used only the tick box options. In 2022, we plan to look at the size of the responses within the write in box and, where these are sufficiently large, include that response within the standard outputs.

7.4 NRS will continue to provide a commissioned table service for Scotland's Census 2022 data if customer requirements are not available via the flexible table builder.

7.5 For users who require more specialist products such as the Safeguarded and Secure Microdata sets, it is intended that the Safeguarded Microdata will be available via UKDS and the Secure Microdata via the Virtual Microdata laboratory managed by ONS and at the Scottish National Safe Haven.

7.6 NRS also plans to provide Application Programming Interface (API) functionality, alongside the flexible table builder, to allow users to manipulate the data using different Integrated Development Environments (IDE). API functionality also has the potential to enable users to pull out UK data from one source, where UK comparable census data is available.

7.7 NRS plan to start publishing results from the census approximately a year after collection.

8. Conclusion

8.1 The strategy notes that both the success and the learning points from the 2011 Census will be taken forward as a part of the planning for the next Census. The strategy seeks to improve the user experience by providing easily accessible and high quality outputs.

8.2 The strategy also recognises the complexity of the output production. User needs must be balanced against protecting confidentiality of individuals and the cost of the resources required to disseminate the results in a way that will maximise their utility.

8.3 In order to best meet the requirements of census users the strategy will be reviewed as the project develops.

9. Key questions for users to consider

We would encourage users to provide feedback on this strategy either through attending one of our stakeholder events in February and March 2018 or by completing the online questionnaire. In particular users should consider the following points:
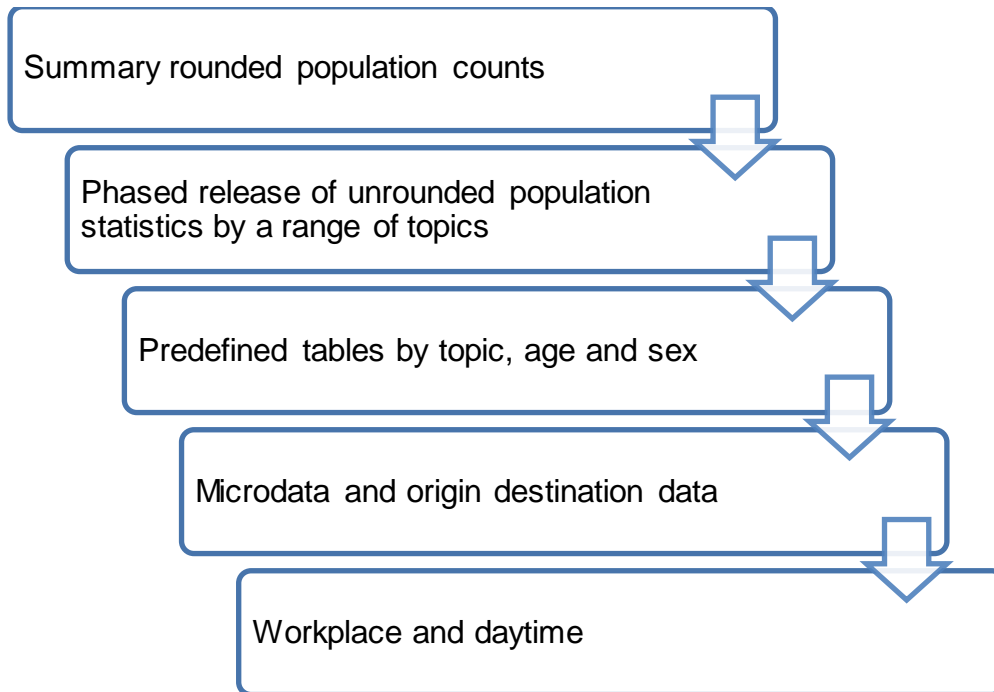
1. Whether the reduction in the number of standard tables have a significant impact

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2. The advantages and new opportunities introduced through a flexible table builder that will enable users to make their own tables
3. Whether the order and timing of the proposed release schedule will suit their needs
4. The additional detail that will be available in tables by having variable breakdowns based on population size rather than only standard questionnaire response options

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10. Census outputs release schedule

For the 2022 census, we will start publishing results from the census approximately a year after collection.

The releases will be phased and the order of these phases are shown below.

Summary rounded population counts

Phased release of unrounded population statistics by a range of topics

Predefined tables by topic, age and sex

Microdata and origin destination data

Workplace and daytime

Exact timings and content subject to statistical disclosure control and UK harmonisation considerations

As we develop our plans we will produce a more detailed schedule on the Scotland's Census website.

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